



## MEMORANDUM

### LABOR REFORM AS A CATALYST FOR GROWTH

#### **I. Introduction**

Puerto Rico faces tremendous challenges. The economy has been shrinking for more than ten years and the Government has amassed over \$70 billion in outstanding debt liabilities and over \$50 billion in unfunded pensions liabilities. Hurricanes Irma and Maria made the situation even more unbearable.

As the Executive Summary of the New Fiscal Plan for the Commonwealth of Puerto Rico (the “New Fiscal Plan”) outlines, the people of Puerto Rico need and deserve plentiful good jobs, a dynamic and prosperous economy, affordable and reliable electricity, and an efficient and responsive public sector—but have been deprived of such for more than a decade. Instead, since 2005, the number of people living under the poverty level has increased, the economy has shrunk, electricity has remained expensive and unreliable, labor market regulations have remained burdensome—hindering job creation for the people—and the public sector has provided declining levels of service at a high cost to citizens. These problems predate Hurricanes Irma and Maria and will continue to plague Puerto Rico long after it recovers from the storms unless the necessary actions are taken.

The Island faces immense challenges with labor force participation and preparedness.<sup>1</sup> As exemplified on **(Exhibit 1)**, the Island’s formal labor force participation rate is only ~40%, far from the U.S. mainland average (63%) or even the lowest-ranked U.S. state (West Virginia, 53%), and well below other Caribbean islands. In fact, according to World Bank data, Puerto Rico’s labor force participation rate is currently 7<sup>th</sup> lowest in the world and has never ranked higher than the bottom 20 out of more than 200 countries and territories surveyed.<sup>2</sup> Moreover, Puerto Rico’s youth

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<sup>1</sup> It is tempting to conclude that, due to Puerto Rico’s large informal labor market, the true labor force participation rate is far higher than the official statistics that policymakers rely upon. However, research by Maria Enchautegui (University of Puerto Rico) and Richard Freeman (Harvard University) concludes that this is unlikely to be the case. Many individuals who participate in the informal labor market are likely described in household surveys as self-employed, and the self-employed are included when those survey data are used to calculate the labor force participation rate. For this reason, as well as based upon a survey conducted among male Puerto Rico residents, Enchautegui and Freeman conclude that the official labor force participation rate understates the true labor force participation rate by only a few percentage points. Enchautegui, Maria, and Richard B. Freeman. “*Why don’t more Puerto Rican men work? The rich uncle (Sam) hypothesis.*” Working paper No. w11751. National Bureau of Economic Research, 2005.

<sup>2</sup> Puerto Rico ranking has never surpassed 215th out of the 232 countries, states, and territories tracked by The World Bank Group since The World Bank Group began collecting data in 1990.



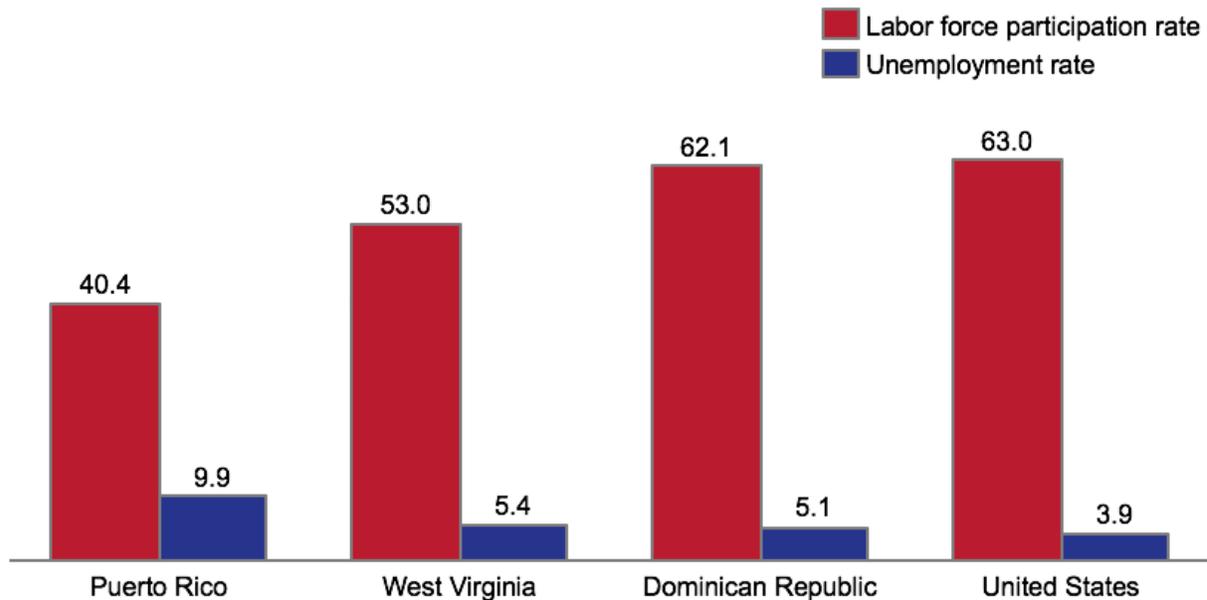
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unemployment rate is 23.8%, almost double the world average (13.8%) and more than double the U.S. average (10%).<sup>3</sup>

**Exhibit 1: Labor Force Participation and Unemployment Rates<sup>4</sup>**

Labor force participation rate and unemployment rates, %



Low labor force participation in Puerto Rico is a function neither of Hurricane Maria nor the economic downturn that began in 2006. The Statement of Motives of Act No. 4 of 2016 indicates that as of October 2016, the labor participation rate of Puerto Rico was at 39.8%, while it was at 62.8% for the United States. The reality in the Island contrasted dramatically with that prevailing in 1950, when the labor participation rate of Puerto Rico was 57.9% and that of the United States was 60%. Low rates of employment are a long-term structural problem that can be addressed only through significant changes to public policy. The PROMESA legislation expressed Congress’s opinion that “any durable solution for Puerto Rico’s fiscal and economic crisis should include permanent, pro-growth fiscal reforms...” The labor and welfare reforms discussed herein form part of that commitment to fulfill the stated goals of PROMESA.

Low rates of employment contribute to Puerto Rico’s low incomes and its high rate of poverty. As the studies and analyses provided below demonstrate, were Puerto Rico to increase its labor force

<sup>3</sup> The World Bank Group, 2017, via International Labour Organization, ILOSTAT database. Data retrieved in March 2017. <https://data.worldbank.org/indicator/SL.UEM.1524.ZS>.

<sup>4</sup> “Dominican Republic Unemployment Rate,” Trading Economics, [www.tradingeconomics.com/dominican-republic/unemployment-rate](http://www.tradingeconomics.com/dominican-republic/unemployment-rate); “Unemployment Rates for States,” U.S. Bureau of Labor Statistics, U.S. Bureau of Labor Statistics, [www.bls.gov/web/laus/laumstrk.htm](http://www.bls.gov/web/laus/laumstrk.htm); “United States Unemployment,” Trading Economics, [www.tradingeconomics.com/united-states/unemployment-rate](http://www.tradingeconomics.com/united-states/unemployment-rate).



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participation rate even to that of the lowest mainland state – West Virginia – household incomes would rise significantly, poverty would fall and many of the government’s budget problems would be addressed. Approximately 60% of the gap in median household incomes in Puerto Rico and the poorest mainland state, Mississippi, is accounted for by Puerto Rico’s far lower labor force participation rate.<sup>5</sup>

Since 2000, about 600,000 Puerto Ricans have relocated to the state of Florida, many in search of employment opportunities.<sup>6</sup> Florida is an at-will employment state and does not require employers to provide any paid vacation or sick days or Christmas bonus.<sup>7</sup>

About one-quarter of Puerto Ricans work informally. The informal labor market, which is far larger in Puerto Rico than anywhere in the rest of the United States, is driven in part by labor laws which make it uneconomical to hire employees with full benefits and job protections.<sup>8</sup> The informal economy diminishes Puerto Rico’s tax base, from which the Government funds public services. More importantly, employees in the informal sector currently do not have access to legal employment rights and to Social Security for the future.

Unless Puerto Rico substantially increases its labor force participation and employment, incomes will always fall far below mainland states and outmigration will continue to draw Puerto Ricans away from the island of their birth. **While many other reforms are integral to making these improvements, increasing labor force participation may be the single most important objective for long-term economic well-being in Puerto Rico.**

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<sup>5</sup> Calculated using Mississippi’s (the poorest mainland state) labor force participation rate of 55.6% and Puerto Rico’s labor force participation rate of 40%; and MS’s median household income of \$39,218 and PR’s of \$19,606. By multiplying PR’s median household income by 55.6/40, the product is \$27,252, leaving a cap of only \$11,966.

<sup>6</sup> Rayer, Stefan and Ying Wang, “*Growth Of The Puerto Rican Population In Florida And On The U.S. Mainland*,” University of Florida, Bureau of Economic and Business Research, February 9, 2018. <https://www.bebr.ufl.edu/population/website-article/growth-puerto-rican-population-florida-and-us-mainland>.

<sup>7</sup> “The 2017 Florida Statutes,” Florida Legislature. [http://www.leg.state.fl.us/Statutes/index.cfm?App\\_mode=Display\\_Statute&URL=0400-0499/0448/0448PartIContentsIndex.html&StatuteYear=2017&Title=-%3E2017-%3EChapter%20448-%3EPart%20I](http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=0400-0499/0448/0448PartIContentsIndex.html&StatuteYear=2017&Title=-%3E2017-%3EChapter%20448-%3EPart%20I); “Florida Leave Laws,” Employment Law Handbook. <https://www.employmentlawhandbook.com/leave-laws/state-leave-laws/florida/>.

<sup>8</sup> Estimates of the size of the informal economy are 15-20% of GNP, correlating to \$10-14 billion, pre-Maria. Rates derived from “Congressional Task Force on Economic Growth in Puerto Rico,” U.S. Congress, December 20, 2016. <https://www.finance.senate.gov/imo/media/doc/Bipartisan%20Congressional%20Task%20Force%20on%20Economic%20Growth%20in%20Puerto%20Rico%20Releases%20Final%20Report.pdf>, p. 11; GNP is FY2016 projected (\$70.1B) from “Statistical Appendix of the Economic Report for the Governor and Legislative Assembly,” Government Development Bank for Puerto Rico, 2018. <http://www.gdb.pr.gov/economy/statistical-appendix.html>.



**The manner in which labor regulations are structured – and the costs and risks they impose as part of normal business transactions – harms Puerto Rico’s ability to create good-paying jobs in the private sector. These costs and risk reduce the economic growth and future revenues projected in the New Fiscal Plan. Therefore, fostering a regulatory environment conducive to increasing labor participation rates is essential to fulfilling fiscal projections.** More importantly, higher employment levels and better-paying jobs are crucial to transforming Puerto Rico’s economy from one that trends downward to one that has a brighter future.

On April 19, 2018, pursuant to 201(e)(2) of PROMESA, the Oversight Board voted to certify the fiscal plan for the Commonwealth of Puerto Rico, pursuant to Section 201(d)(2) of PROMESA (the “New Fiscal Plan”). On April 24, 2018, pursuant to Section 201(e)(2) of PROMESA, the Oversight Board delivered to the Government of Puerto Rico, a compliance certification for the New Fiscal Plan as well as copy of the New Fiscal Plan.

An integral component of the New Fiscal Plan is the adoption of certain limited changes to Puerto Rico’s labor laws, the establishment of a local Earned Income Tax Credit (EITC), and the creation of certain work requirements and work bonuses for the participants in the Nutritional Assistance Program (PAN).

On May 21, 2018, the Board agreed to focus labor reform on transforming Puerto Rico into an “employment-at-will” jurisdiction, the establishment of a local Earned Income Tax Credit (EITC), and the creation of certain work requirements and work bonuses for the participants in the Nutritional Assistance Program (PAN). The adoption of these limited labor market reforms is projected to generate \$319 million in additional revenues collected by the Government of Puerto Rico over the five-year period covered by the Plan. Moreover, by implementing labor reform, Puerto Rico will have access to reinvest over \$700 million to promote further economic development and reduce the risk of reform implementation by investing in infrastructure projects and recovery, digital reform, implementation of ease of doing business reforms, and procurement reform. In addition, given the ongoing recovery after hurricanes, this reinvestment will include a Municipality Recovery Fund and into the UPR’s needs-based scholarship fund. This reinvestment, along with the PAN work requirement and EITC, will bolster employment as well as ensure that those entering the workforce are more prepared to earn higher wages.

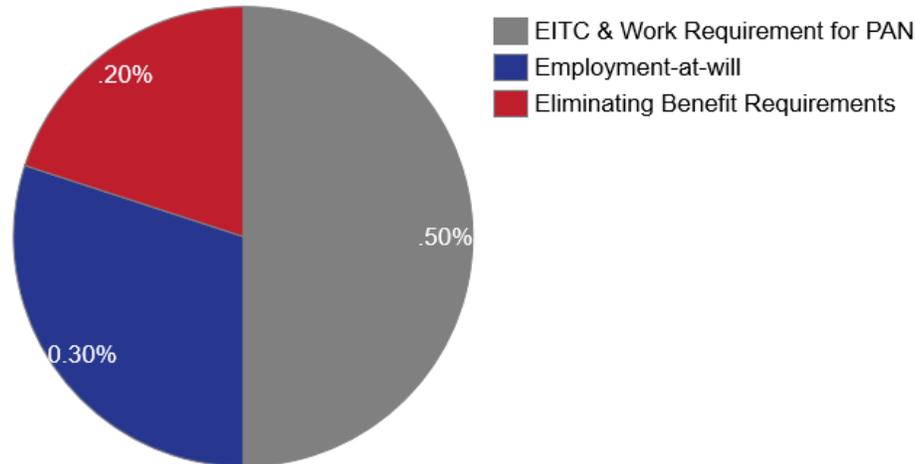
The Oversight Board’s economist has scored the monetary value of the overall Labor Reform Package contained in the New Fiscal Plan at one (1) full percentage point of permanent growth, about half of which would come from the labor supply side through the EITC and limited work-requirement for PAN, and half from the labor demand side. Consistent with the Italian experience and the IMF study noted below, it was estimated that about 0.3% points would come from easing employment protection (*i.e.*, implementing an “employment-at-will” regime) and 0.2% points from eliminating benefit requirements, such as generous paid vacation. As seen in **(Exhibit 2)**, and given the New Fiscal Plan accommodation agreed to with the Governor, the scoring of the labor reform package presently envisions a 0.80 percentage point of permanent growth.<sup>9</sup>

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<sup>9</sup> Wolfe, Andrew, “Derivation of 0.3%-point increase in growth from the implementation of “employment-at-will””



**Exhibit 2: Estimated Incremental GNP Growth from Labor Reforms**



**The Oversight Board believes the measures required in the Labor Package of the New Fiscal Plan will improve the vibrancy of the local labor market; make Puerto Rico more competitive and attractive for job-creating investments; promote more hiring within the formal economy; and produce more revenue to the government.**

***None of the provisions of the labor reform place workers in Puerto Rico at a disadvantage in comparison to workers on the mainland. None of the provisions of the labor reform strip workers in Puerto Rico of rights enjoyed by workers on the U.S. mainland. None of the provisions create incentives for workers to abandon the island seeking greater protections under state laws- since no state grants protections beyond what is contemplated by the labor reform.***

The reforms contained in the New Fiscal Plan have been used effectively to turn around economies in many countries. They provide a realistic and achievable blueprint for success, with proven methods for growth, restoring business confidence, improving competitiveness, ending the debt crisis, and attracting the investment needed to transform the Island. This roadmap for recovery will produce more jobs, better living conditions and improve educational and healthcare outcomes for Puerto Rico’s residents.

The analyses, data, and studies included in this memorandum intend to provide information supporting the adoption of human capital and labor reforms for the benefit of the people of Puerto Rico. **Given the recent accommodation to the New Fiscal Plan, the numbers reflected in this memorandum will be conformed to reflect final technical adjustments in the recertification of the New Fiscal Plan.**



## **II. Employment Laws Matter**

Puerto Rico's historically low levels of formal labor force participation cannot be attributed to any single factor, but a range of public policies have served to reduce employment on the Island. Puerto Rico has by far the most generous mandated employer benefits in the U.S., which increase the cost of hiring employees. Unlike Puerto Rico, no mainland state mandates any paid vacation and few mandate even a modest amount of sick leave. No state requires employers to pay a Christmas bonus. Thus, it can be more expensive to employ a low-wage worker in Puerto Rico than on the mainland, making Puerto Rico less competitive in labor-intensive sectors such as tourism.

Economists have documented that when employers are required to provide an employee benefit, those employers will tend to recoup the costs of those benefits by reducing the wages paid to employees.<sup>10</sup> When employers are prevented from reducing wages to offset costs of mandated benefits, as may be the case with a minimum wage worker, they may choose to reduce the number of workers they hire. Thus, it is reasonable to assume that Puerto Rico's high levels of mandated employer-paid benefits reduce both wages and employment relative to a scenario in which such benefits were not required.

Likewise, there is evidence that employer benefit costs can increase the size of the informal labor market, where income is not reported, and such benefits need not be provided.<sup>11</sup> About one quarter of Puerto Rican workers participate in the informal economy according to Estudios Técnicos,

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<sup>10</sup> This has been shown to be true with employer-paid Social Security taxes, health coverage, maternity leave, and other benefits. For instance, the Congressional Budget Office and the Social Security Administration both assume that an increase in Social Security payroll taxes levied on employers would result in a roughly dollar-for-dollar reduction in employee wages. Likewise, when the Affordable Care Act ("Obamacare") was projected to reduce the rate of growth of employer health care costs, the Social Security and Medicare Trustees assumed that this would be reflected in increased wages paid to employees. Gruber and Krueger (1991) found that employer costs for workers compensation insurance are largely shifted to employees via lower wages. Gruber (1994) found that when employers were required to provide maternity health benefits to employees, wages for employees declined by a similar amount. Prada et al (2017) found that when Chile required employers to provide free child care, wages for women declined by 9 to 20 percent. Kolstad and Kowalski (2016) found that when Massachusetts required employers to provide health insurance, wages for employees declined by an amount similar to the health premiums paid by employers. (Gruber, Jonathan, and Alan B. Krueger. "The incidence of mandated employer-provided insurance: Lessons from workers' compensation insurance." *Tax Policy and the Economy* 5 (1991): 111-143. Gruber, Jonathan. "The incidence of mandated maternity benefits," *The American Economic Review* (1994): 622-641. Prada, María F., Graciana Rucci, and Sergio S. Urzúa. *The effect of mandated child care on female wages in Chile*. No. w21080. National Bureau of Economic Research, 2015. Kolstad, Jonathan T., and Amanda E. Kowalski. "Mandate-based health reform and the labor market: Evidence from the Massachusetts reform." *Journal of Health Economics* 47 (2016): 81-106.)

<sup>11</sup> Kugler et al (2017) found that a reduction in employer payroll taxes in Colombia reduced the size of the country's informal labor market. Kugler, Adriana, Maurice Kugler, and Luis Omar Herrera Prada. "Do payroll tax breaks stimulate formality? Evidence from Colombia's reform." No. w23308. National Bureau of Economic Research, 2017



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substantially higher than any mainland state.<sup>12</sup> The informal economy is detrimental to the Island because it diminishes Puerto Rico's tax base, from which the Government funds public services. And more importantly, those working in the informal sector currently do not have access to certain legal, financial, and labor rights and to Social Security for the future.

Puerto Rico law imposes upon an employer costly mandatory employer-provided benefits that are not comparable to those prevailing in other jurisdictions under the U.S. flag. These compulsory benefits effectively increase labor costs. Moreover, the compulsory vacation and sick leave benefits constitute payments for time not worked. In addition to these above market "labor cost" factors, Puerto Rico lacks "at-will employment," which would permit employers to manage their business and make non-discriminatory personnel decisions without being exposed to substantial monetary risks. While there are variations in labor laws among the 50 mainland states, 49 of them follow the "at-will employment" legal rule (**Exhibit 3**). This rule avoids court's "second guessing" the validity of legitimate and non-discriminatory discharge decisions. The only state that has departed from this regime is Montana, and that statute was enacted to *reduce* the monetary exposure Montana state courts had imposed in wrongful discharge claims.

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<sup>12</sup> Estudios Técnicos, Inc, "The Informal Economy in Puerto Rico," August 9, 2012



**Exhibit 3: Employment-at-will in the U.S. States and Puerto Rico**

State/Territory	Employment-at-will
Alaska	YES
Arizona	YES
Arkansas	YES
California	YES
Colorado	YES
Connecticut	YES
Delaware	YES
Florida	YES
Georgia	YES
Hawaii	YES
Idaho	YES
Illinois	YES
Indiana	YES
Iowa	YES
Kansas	YES
Kentucky	YES
Louisiana	YES
Maine	YES
Maryland	YES
Massachusetts	YES
Michigan	YES
Minnesota	YES
Mississippi	YES
Missouri	YES
Montana	NO
Nebraska	YES

State/Territory	Employment-at-will
Nevada	YES
New Hampshire	YES
New Jersey	YES
New Mexico	YES
New York	YES
North Carolina	YES
North Dakota	YES
Ohio	YES
Oklahoma	YES
Oregon	YES
Pennsylvania	YES
Rhode Island	YES
South Carolina	YES
South Dakota	YES
Tennessee	YES
Texas	YES
Utah	YES
Vermont	YES
Virginia	YES
Washington	YES
West Virginia	YES
Wisconsin	YES
Wyoming	YES
District of Columbia	YES
Puerto Rico	NO

The impact of Puerto Rico’s labor regulatory regime on future private sector economic growth has already been recognized by the Government of Puerto Rico with the enactment last year of the *Labor Transformation and Flexibility Act*, Law No. 4-2017. The *Statement of Intent* of Law No. 4 sets forth significant labor economic findings which justified the modification of several employment laws.

The extensive legislative findings contained in Law No. 4’s *Statement of Intent*, coupled with the detailed Senate and the House of Representative’s *Committee Reports*, unambiguously recognize the burden of certain Puerto Rico employment laws on efficient labor markets and job destructive effects of several of these laws. The present Administration’s “Government Plan” also recognized the interrelation between Puerto Rico’s low employment levels and its labor regulatory structure.



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All of these are in line with prior observations made by local and internationally recognized economists regarding the adverse impact of various Puerto Rico labor laws.<sup>13</sup>

The Government of Puerto Rico has recently made strides to improve labor market conditions with the *Labor Transformation and Flexibility Act* (Act 4-2017) in January 2017. Notwithstanding such reforms, Puerto Rico's labor laws remain by far the most burdensome in the U.S.

The question presented is *not* whether the level and structure of Puerto Rico's mandatory benefit and discharge laws adversely impact the island job creation ability. Rather, the question is whether the Law No. 4 implemented a sufficient degree of labor reform to achieve its stated objective of transforming Puerto Rico into "an attractive jurisdiction to establish business and create job opportunities; to foster growth in the level of jobs in the private sector; and to offer new job opportunities to unemployed people." *Statement of Intent*, p.3. **The Oversight Board's estimation is that Law No. 4 did not implement the extent of labor reform required to alter the existing structural obstacles to job creation and retention. Accordingly, additional actions are necessary if Puerto Rico intends to compete with other jurisdictions within the United States to attract job-creating investments.**

Notwithstanding Law No. 4's reforms, Puerto Rico's labor laws remain by far the most burdensome in the U.S. The Island still requires yearly Christmas bonuses of \$600 (or \$300 for small employers); typically mandates up to 27 days of paid leave per year;<sup>14</sup> and exposes employers to substantial severance payouts, therefore imposing costs and regulatory burdens that reduce employment, wages and economic opportunity.

After little over a year of the approval of the *Labor Transformation and Flexibility Law*, a review of the impact of that legislation shows there is a need to make deeper structural reforms, in order to make Puerto Rico as attractive a location to create jobs as the continental states. In the Oversight Board's estimation, there is a reasonable basis to conclude that Puerto Rico's wrongful discharge statute, coupled with other mandatory benefit legislation that imposes labor costs beyond competitive levels, adversely impacts job growth and the Government's future revenue projections.

The Oversight Board invites the Puerto Rico Legislature to recognize that the private sector labor relations regime in the continental states has remained consistent on the principle that, except for reasons prohibited by law, hiring and employment tenure should be free from government control through dismissal laws. The *Employment-At-Will* system has been widely examined. At-will

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<sup>13</sup> Law No. 4's *Statement of Intent*, expressly cites Dr. James Tobin (Nobel Prize in Economics, 1981); Dr. Anne Krueger (former first deputy managing director of the International Monetary Fund); Dr. Elías R. Gutiérrez and economist Gustavo Vélez.

<sup>14</sup> Puerto Rico maintains a complex regimen of mandatory decrees that dictate different vacation and sick leave accrual rates, some of which establish up to 18 vacation and 18 sick leave days per year. In 1995 a law was passed to cap vacation and sick leave accrual rates at 15 and 12 days, respectively, but employees hired before August 1, 1995 were grandfathered if they previously were entitled to higher rates. Most employees in Puerto Rico are covered by mandatory decrees that grant 15 vacation and 12 sick leave days per year.



employment ensures that the employment tenure is based on productivity and good conduct and prevents any undue government intrusion in essential business decisions.

### **III. “Back to Work” Welfare Policies**

In addition to the Island’s labor laws, Puerto Rico residents may also face disincentives to participate in the formal labor market due to rules attached to various welfare benefits, including the Nutritional Assistance Program (PAN), Mi Salud (Medicaid), Section 8 public housing, TANF, WIC, and other programs.

These benefits are sometimes stereotyped with a claim that “welfare pays more than work.” But the issue is really that working in the formal sector can cause punitive reductions in the transfer benefits the household would receive were it not to work in the formal sector. The problem occurs because when welfare beneficiaries work in the formal sector and receive earnings, this triggers a reduction in their benefits. The phase-out of government transfer benefits as earned income increases acts as a tax to disincentivize formal employment, as effective hourly wage (income received by working minus the loss of benefits) can be substantially lower than the formal hourly wage received.

In a 2015 report, the Congressional Budget Office noted that

The effective marginal tax rate is the percentage of an additional dollar of earnings that is unavailable to an individual because it is paid in taxes *or offset by reduced benefits from government programs*. That rate affects people’s incentives to work. In particular, when marginal tax rates are high, people tend to respond to the smaller financial gain from employment by working fewer hours, altering the intensity of their work, or not working at all.<sup>15</sup>

This is precisely the problem faced in Puerto Rico, but it is very likely to be worse on the Island than in mainland states.

While transfer benefits in Puerto Rico are not more generous than on the mainland in dollar terms, they *are* more generous relative to the wages generally available for individuals currently receiving transfer benefits. For instance, monthly food stamp benefit levels are similar in Puerto Rico and mainland, but the market wages available to a food stamp beneficiary in Puerto Rico are substantially lower. Thus, the trade-off between work and welfare in Puerto Rico is not as attractive as on the mainland. Thus, the effective marginal tax rate on low-income Puerto Rico residents from entering the workforce is likely to be higher, perhaps substantially so, than on the mainland.

It is difficult to quantify how large such disincentive effects may be due to limitations on the data available. Different individuals entitled to different sets of benefits face different incentives should

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<sup>15</sup> Congressional Budget Office. “Effective Marginal Tax Rates for Low- and Moderate-Income Workers in 2016.” November 19, 2015.



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they work. Still, it is reasonable to conclude that for many welfare beneficiaries, formal sector work may sometimes do little to increase household incomes.

For individuals receiving food stamps, Mi Salud, TANF and public housing, it often makes little financial sense to work at the minimum wage in the formal sector. For a full-time minimum wage worker the loss of benefits will offset most or all income received from work, leaving the household no better off.<sup>16</sup> Add in the complications and costs for those with children to be working outside the home and the incentives for breadwinning family members to work in the informal sector only become magnified.

Though few Puerto Rico residents receive all these benefits,<sup>17</sup> even receipt of a single type of benefit can alter incentives to engage in the formal workforce. For instance, a single mother with two children and annual income below \$4,900 is eligible to receive approximately \$4,229 in annual PAN (“food stamp”) benefits. But should that individual work 35 hours per week at the minimum wage, her annual earnings of \$12,180 would cause her to lose eligibility for food stamps. Net of taxes on her earnings, working full-time would increase her household’s annual income by only \$7,002, equivalent to an hourly wage of only \$3.86. Under those conditions, some individuals may choose not to work in the formal labor market, especially if they have to pay for child care

Even when TANF and Section 8 housing benefits are excluded, monthly income paid to a minimum wage worker with two children is only \$329 greater than what he or she could receive from government benefits.<sup>18</sup> In this example, effective hourly pay (the amount received from working more than what the individual could receive from government benefits without working) is only about \$2.35.

Mainland states face many of these same incentive problems, which they address in two ways. First, residents of mainland states are eligible for the Federal Earned Income Tax Credit (EITC), which provides a partial refund against Federal income taxes for eligible low-income workers. Many states supplement the Federal EITC to increase net incomes to individuals who work. By increasing the reward to work, the EITC has been shown to increase labor force participation.<sup>19</sup> However, because Puerto Rico residents do not pay Federal income taxes they are not currently eligible for the Federal EITC.

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<sup>16</sup> Burtless, Gary, and Orlando Sotomayor. “*Labor supply and public transfers*,” in *The Economy of Puerto Rico: Restoring Growth* (2006): 82-151.

<sup>17</sup> See Héctor R. Cordero-Guzmán, “*The Production and Reproduction of Poverty in Puerto Rico*,” in Nazario, Carmen R., ed. *Poverty in Puerto Rico: A Socioeconomic and Demographic Analysis with Data from the Puerto Rico Community Survey* (2014). Inter American University of Puerto Rico, Metro Campus, 2016. Cordero. Notes that the number of TANF beneficiaries in Puerto Rico is relatively modest and many, due to age or disability, are unlikely to work under any conditions

<sup>18</sup> Advantage Business Consulting. “*Beneficios de las Personas Elegibles al TANF vs. Escenario de Salario Mínimo Federal*.” Prepared for the Universidad Interamericana, May 2015

<sup>19</sup> See Eissa, Nada, and Jeffrey B. Liebman. “*Labor supply response to the earned income tax credit*.” *The Quarterly Journal of Economics* 111, no. 2 (1996): 605-637



Likewise, the Federal Government requires that food stamp programs on the mainland (Supplemental Nutrition Assistance Program, “SNAP”) contain a work requirement. In general, working-age SNAP beneficiaries on the mainland must register for work, cannot turn down a job if offered, and may be required by the state to attend education or work training classes. In addition, Federal law requires that non-disabled adults without dependents must work, attend education, or volunteer at least 20 hours per week to maintain eligibility for benefits. Federal law requires that individuals who fail to satisfy these work requirements lose benefits for at least one month for the first instance, three months for the second instance and six months for the third violation. States are allowed to set more stringent penalties, up to and including permanent disqualification from benefit receipt. Roughly half the states adopt the federal penalties for violating work requirements and half have stronger penalties.

Puerto Rico’s labor and welfare laws may help explain why, despite the Island’s natural beauty, attractions and ease of access from the U.S. market, employment in tourism-related industries is low. According to the U.S. Bureau of Labor Statistics (BLS), Puerto Rico employs only 80,000 individuals in the leisure and hospitality industries – 10,000 fewer tourism-related jobs than the state of Nebraska, which lacks Puerto Rico’s natural assets and has an overall population over one-third smaller than Puerto Rico.

But there is a positive aspect to these findings. **If Puerto Rico’s labor and welfare policies contribute to low levels of employment, low incomes and high poverty rates, then adopting pro-employment policies can increase job availability and incomes in Puerto Rico.** The Board does not claim that labor and welfare reform by itself will fix all of Puerto Rico’s myriad economic problems, and even less so that a single aspect of labor and welfare reform is a cure-all. But without higher labor force participation Puerto Rico is not a viable economic entity; its ability to service its debt and return to capital markets will be reduced, poverty will remain high and outmigration will continue to sap the island of its population.

#### **IV. Future Vision for the Puerto Rico Labor Market**

Changes to labor and welfare laws are controversial and can be disruptive. Nevertheless, dramatic changes to Puerto Rico’s labor market policies are necessary to provide opportunity for a greater standard of living at home, reversing the Island’s history of high poverty, constrained budgets, and pressure for young Puerto Ricans to leave their home for the mainland.

To ensure Puerto Rico can provide opportunities for its people for years to come, structural reforms must make it easier to hire, encourage workforce participation, and enhance student outcomes and workforce development opportunities to ensure a pipeline of prepared and appropriately-skilled individuals.

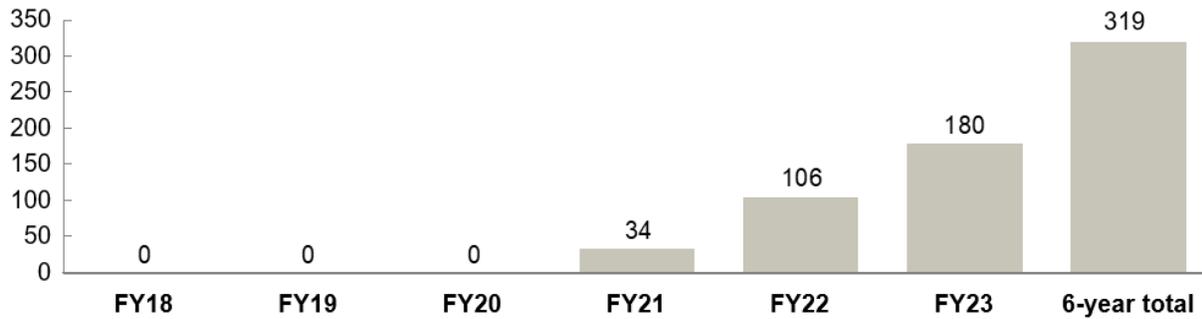
If Puerto Rico were to aim to increase the labor force participation rate to 47% and reduce the youth unemployment rate to 20.2% by FY2023, Puerto Rico would close roughly half the current gap between Puerto Rico and the lowest U.S. state (West Virginia). By achieving these goals, the Government can increase household incomes, cut the poverty rate and reduce incentives to emigrate to the mainland. Moreover, successful labor market reforms are projected to yield



approximately \$39 billion in additional revenues by FY2048 and over ~\$319 million from FY2018-23 (Exhibit 4).

**Exhibit 4: Labor Reform Surplus in the New Fiscal Plan Period**

Labor Reform Surplus, \$M



**V. Structural Reform Initiatives to Change Labor Conditions**

Labor market reforms will increase the availability of jobs while increasing incentives and preparedness to work. To accomplish this broad-based reform, the Government must implement flexible labor regulations, reform welfare including an EITC for low-income workers and a work requirement for able-bodied PAN beneficiaries, and implement programs to develop critical skills in the workforce.

**a. Flexible labor regulations by becoming an employment “at-will” jurisdiction**

Puerto Rico lacks “at-will employment.” This is the regime that applies to job termination decisions in 49 mainland states. At-will employment regimes reduce the risks and operational costs when an employer needs to dismiss an employee for reasons of performance, conduct or workforce reduction.

While some employees benefit from Puerto Rico’s lack of at-will employment, excessive employment protections make it more costly and risky to hire an employee. There is significant research backing this conclusion.

Both Puerto Rico and the U.S. Virgin Islands maintain wrongful discharge laws and both jurisdictions maintain unemployment levels that consistently exceed double the national unemployment rates. And Puerto Rico law is far more burdensome than U.S.V.I. law since it does not exempt small employers and it regulates dismissals resulting from workforce reductions due to economic hardship or the cessation of business operations.<sup>20</sup>

Puerto Rico’s Law No. 80 *does not* prohibit any type of discharge. However, it is based on the premise that, even when a discharge decision is not motivated by illegal reasons, the government should be

<sup>20</sup> 24 V.I.C. §76(c).



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able to “second guess” an employer’s managerial decision to terminate the employment of a worker for reasons of unsatisfactory conduct, substandard performance or lack of competence. Moreover, when due to periodic economic cycles the employer needs to reduce the size of its workforce, Law No. 80 dictates the manner in which an employer must select who should be laid off and who should be retained. This government intervention in important business decisions is accomplished through the imposition of steep monetary penalties.

Puerto Rico’s Wrongful Discharge Law has an adverse effect on an employer’s ability to operate efficiently. The law imposes significant costs, in terms of the monetary amount imposed as a severance payment, as well as litigation costs, in the event that non-payment of the severance is challenged in court. Ultimately, even when the “just cause” for termination is litigated, the uncertainty of the outcome in court tends to result in discharge payments and the imposition of attorney’s fees.

In short, in Puerto Rico, every employment termination decision exposes a business to significant costs. And since an employer cannot know ahead-of-time which employees may in the future be dismissed, every hiring decision carries risks. Substantial research show that firms take those risks into account when hiring employees and react in ways that harm unemployed or less-skilled workers who most need jobs.

For over four decades the potential monetary exposure in wrongful discharge claims was the payment of one month’s salary or less. This began to change in 1976, with the enactment of Law No. 80, which added one (1) week’s salary per year of service to the severance payment. More significantly, Law No. 80 limited the reasons to justify a discharge without having to incur in the severance payment. Over the years, the monetary amount of the severance payment has increased. In the year 2005 the severance payment increased dramatically, as follows:

- During the first five (5) years of service: 2 month’s salary, plus 1 weeks’ salary for each year of service;
- From five (5), but less than fifteen (15) years of service: 3 month’s salary, plus 2 weeks’ salary for each year of service; and
- Fifteen (15) or more years of service: 6 months’ salary, plus 3 weeks’ salary for each year of service.

With the approval of *Labor Transformation and Flexibility Act* the Government of Puerto Rico recognized that the third tier of the severance formula (15 or more years of service) had a chilling effect on an employer’s ability to operate its business and, therefore, was detrimental to Puerto Rico’s competitiveness. Accordingly, a uniform severance payment was established, based on the *second tier* of the prior formula and subject to a cap of nine (9) month’s salary. However, the Legislature limited this new severance formula to only employees hired *after* January 26, 2017.

If the new Law No. 80 compensation structure was deemed a better balance, it should have applied to all employees.

Further, by maintaining the prior compensation formula for employees hired before January 26, 2017, during the first five years of service new employees have *higher* severance payments. Accordingly, during the first years after the approval of Law No. 4, a discharge of a new employee



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entails a greater cost than the discharge of an employee hired shortly before the enactment of Law No. 4.

Upon further review of the Law No. 4 amendments to Law No. 80, the Oversight Board finds they are insufficient to remedy the statute's adverse effect on the ability to do business and hire employees in Puerto Rico. The Oversight Board is confident that from a micro and macroeconomic perspective, the adoption of an "at-will" employment regime is the most efficient manner to address job termination decisions. By taking such legislative action businesses and employees in Puerto Rico would be subject to the same labor market rules that are applicable to their counterparts in the mainland states. Notwithstanding this change, employees in Puerto Rico will continue protected by multiple anti-discrimination laws, as are employees on the mainland.

Adopting in Puerto Rico the "at-will" employment regime that prevails in the U.S. mainland will assist in reducing long term unemployment in the private sector and increase the hiring of workers as permanent, rather than temporary employees. Moreover, adoption of this regime should assist in attracting job-creating investments.<sup>21</sup> This, in turn, will increase revenues to the Government.

This is not the first-time changes to the severance regime has been recommended. During recent years the adverse economic impact of Puerto Rico's general dismissal law has been subject to scrutiny. The Krueger Report, which was commissioned by the Government of Puerto Rico, recommended that Puerto Rico regulate discharge decisions with rules more similar to those prevailing in the U.S. mainland.<sup>22</sup> Subsequently, the *Working Group for the Fiscal and Economic Recovery of Puerto Rico Pursuant to Executive Order 2015-022*, recommended that Law No. 80 apply only to "non-exempt" employees and that the maximum compensation be limited to six (6) month's salary.<sup>23</sup>

While some employees benefit from Puerto Rico's lack of at-will employment, excessive employment protections make it more costly and risky not only to dismiss, but also to hire, an employee. There is evidence that such job protection laws lower employment opportunities.

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<sup>21</sup> R. Di Tella & R. MacCulloch, *The Consequences of Labor Market Flexibility: Panel Evidence Based on Survey Data*, 49-5 *European Economic Review*, 1225-59 (2005); B.S. Javorcik & M. Spatareanu, *Do Foreign Investors Care About Labor Market Regulations?*, World Bank Policy Research Working Paper 3275, April 2004; H. Parcon, *Labor Market Flexibility as a Determinant of FDI Inflows*, Department of Economics, University of Hawaii- Working Paper No.08-07 (2008); J. Mogab, R. Kishan, D.E. Vacaflares, *Labor Market Rigidity And Foreign Direct Investment: The Case Of Europe*, *Applied Econometrics and International Development*, Vol. 13-1 (2013); Bellak, C. and M. Leibrecht (2009), *Does the impact of employment protection legislation on FDI differ by skill-intensity of sectors? An empirical investigation*, GEP Discussion Paper 2009/21; W. W. Olney, *A Race to the Bottom? Employment Protection and Foreign Direct Investment*, *Journal of International Economics*, 91-2 (2013) pp. 191–203; Görg, Holger, "Fancy a Stay at the 'Hotel California'? Foreign Direct Investment, Taxation and Firing Costs" (December 2002). IZA Discussion Paper No. 665.

<sup>22</sup> Puerto Rico – A Way Forward (June 29, 2015). *Id.*, at 6, 18.

<sup>23</sup> Puerto Rico Fiscal and Economic Growth Plan (September 9, 2015), at 22.



For example, studies have found that laws restricting an employer's ability to dismiss or imposing significant severance costs have the effect of reducing employment levels or increasing long term unemployment, particularly in labor-intensive industries.<sup>24</sup>

In U.S. states, a study found that expanding unfair dismissal protections caused employers to shift away from using less-skilled workers and toward greater use of capital investments and more-skilled labor.<sup>25</sup> Simply, the risks and costs related to dismissal decisions tend to chill an employer's inclination to hire new employees, particularly younger employees.<sup>26</sup> This results in higher periods of unemployment for those members of the workforce who are not employed.<sup>27</sup>

Other research finds that when firms cannot easily dismiss unsatisfactory employees, they will not hire employees who do not already have a job- as unemployed workers are seen as a greater risk.<sup>28</sup> Still other research concludes that stronger employment protections cause businesses to favor more educated employees, who are seen as less risky to hire than less educated workers.<sup>29</sup>

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<sup>24</sup> RAND Corporation, 1992; H. Feldmann, "Labor Market Regulation and Labor Market Performance: Evidence Based on Surveys among Senior Business Executives." *Kyklos*, 56 (4), pp. 509-539 (2003); Verkerke, J., 2014. *What we know (and don't know) about employment protection law*, in Shishido, Z. (ed.) *Enterprise Law: Contracts, Markets, and Laws in the US and Japan*; Timothy Besley, Robin Burgess; *Can Labor Regulation Hinder Economic Performance? Evidence from India*, *The Quarterly Journal of Economics*, Volume 119, Issue 1, 1 February 2004, Pages 91–134.

<sup>25</sup> Dertouzos, J. & Karoly, L. A. 1993. *Employment Effects of Worker protection: Evidence from the United States*, in: Buechtemann, C. F. (ed.) *Employment Security and Labor Market Behavior: Interdisciplinary Approaches and International Evidence*.

<sup>26</sup> Scarpetta, S., 1996. *Assessing the role of labour market policies and institutional settings on unemployment: a cross-country study*. *OECD Economic Studies* 26 (1), 43-98.; Christensen, Darin & Wibbels, E., *Labor Standards, Labor Endowments, and the Evolution of Inequality*, *International Studies Quarterly*, Volume 58, Issue 2, 1 June 2014, Pages 362–379; Boeri, T. & Ours, Jan va. *The Economics of Imperfect Labor Markets*, Second Edition, sec. 10.3 (2013).

<sup>27</sup> Holt, Harlan and Hendrickson, Joshua R., *Turning Pink Slips into Red Tape: The Unintended Effects of Employment Protection Legislation* (July 26, 2016), *Contemporary Economic Policy*; Elmeskov, J., Martin, J. P. & Scarpetta, S. 1998. *Key lessons for labour market reforms: Evidence from OECD countries' experiences*. *Swedish Economic Policy Review*, 5 (2), 205-52; Emerson, M., 1988. *Regulation or deregulation of the labour market: policy regimes for the recruitment and dismissal of employees in the industrialised countries*. *European Economic Review* 32 (4), 775-817; Hopenhayn, H. & Rogerson, R. 1993. *Job turnover and policy evaluation: A general equilibrium analysis*. *Journal of Political Economy*, 101 (5), 915-38; Rafael Di Tella and Robert MacCulloch, *The Consequences of Labor Market Flexibility: Panel Evidence Based on Survey Data*, 49-5 *European Economic Review*, 1225-59 (2005).

<sup>28</sup> Kugler, Adriana D., and Gilles Saint-Paul. "How do firing costs affect worker flows in a world with adverse selection?." *Journal of Labor Economics* 22, no. 3 (2004): 553-584.

<sup>29</sup> Daniel, K. and Siebert, W.S., 2005. *Does employment protection reduce the demand for unskilled labour?*. *International Economic Journal*, 19(2), pp.197-222.



Moreover, there is significant evidence that employers, in order to avoid risks and costs related to dismissals laws, will increase outsourcing or utilization of temporary employees.<sup>30</sup>

Excessive employment protections may also reduce the productivity of businesses. A 2017 study of firms in Sweden found that smaller businesses that were exempt from a 2001 employment protection law were 2 to 7 percent more productive than firms that were subject to laws similar to Puerto Rico's Law 80.<sup>31</sup>

Di Tella and MacCulloch surveyed entrepreneurs from twenty-one OECD (Organization for Economic Cooperation and Development) countries, asking them to assess the impact of their countries' laws on their hiring and dismissal practices. This study found evidence that the increased flexibility in the rules applicable to employer authority in the hiring and firing process increases *both* employment levels and labor participation rates, even in periods of recession. The study also found evidence that greater flexibility in the hiring and firing stages leads to lower unemployment rates. Providing a conservative estimate, they concluded that if France were to make its labor employment rules as flexible as those in the U.S., its employment rate would increase 1.6 percentage points, or 14% of the employment gap between the two countries.<sup>32</sup>

Other studies sponsored by the OECD have documented that excessive employment protections increase the rate and duration of unemployment and reduce rates of employment.<sup>33</sup> A second study examining 73 developed and developing countries found that protectionist labor regulations increase unemployment.<sup>34</sup> For example, the study suggests that if Italy (a country with extensive labor protectionist regulations) adopted the labor regulations of the U.S., the unemployment rate

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<sup>30</sup> James A. Schmitz, Jr., Lee E. Ohanian, Alvaro Riascos, Harold L. Cole, *Latin America in the Rearview Mirror*, Journal of Monetary Economics (Vol. 52, No. 1, January 2005, pp. 69-107); Autor, David, H. "Outsourcing at will: Unjust dismissal doctrine and the growth of temporary help employment." Working Paper No. w7557. National Bureau of Economic Research, 2000.

<sup>31</sup> Bjuggren, Carl Magnus. "Employment Protection and Labor Productivity." *Journal of Public Economics* (2017).

<sup>32</sup> R. Di Tella & R. MacCulloch, *The Consequences of Labor Market Flexibility: Panel Evidence Based on Survey Data*, 49-5 European Economic Review, 1225-59 (2005).

<sup>33</sup> See, O. Blanchard & J. Wolfers, *The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence*, 110 Economic Journal C1-C33 (2000); J. C. Botero, S. Djankov, R. La Porta, F. Lopez-de-Silanes & A. Shleifer, *The Regulation of Labor*, 119 Quarterly Journal of Economics 1339 (2004); Di Tella & McCulloch, *supra*, (2005); H. Feldmann, *Labor Market Regulation and Labor Market Performance: Evidence Based on Surveys among Senior Business Executives*, 56-4 Kyklos (2003); K. Fialová & O. Schneider, *Labour Market Institutions and their Effect on Labour Market Performance in the New EU Member Countries*, 47-3 Eastern European Economic 57 (2009); Heckman & Pages-Serra, *The Cost of Job Security Regulation: Evidence from Latin American Labor Markets*, NBER Working Paper No. w7773 (2000); y S. Nickell *Unemployment and Labor Market Rigidities: Europe versus North America*, 11-3 Journal of Economic Perspectives 55 (1997).

<sup>34</sup> H. Feldmann, *The Unemployment Effects of Labor Regulation around the World*, 37-1 Journal of Comparative Economics 76 (2009).



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in Italy for the population in general would be reduced by 2.3% (and for young people, unemployment would be reduced by 5.6%). One of the reasons for this is that the rigidity of labor regulations negatively impacts domestic and foreign investments.

When Colombia reduced the cost of dismissing workers, unemployment fell, and the size of the informal labor force declined.<sup>35</sup> In a 2004 book on labor laws in Latin America and the Caribbean, Nobel Prize-winning economist James Heckman concluded that

“mandated benefits reduce employment and... job security regulations have a substantial impact on the distribution of employment and on turnover rates. The most adverse impact of regulation is on youth, marginal workers, and unskilled workers. Insiders and entrenched workers gain from regulation but outsiders suffer. As a consequence, job security regulations promote inequality among demographic groups.”<sup>36</sup>

This review of the literature should make clear the costs that are imposed on residents of Puerto Rico by policies that, while well-intentioned, increase the costs and risks of hiring employees. The repeal of Law No. 80 will facilitate the entry of young or unemployed workers into active employment.

Properly implemented, a more open labor market can help attract new investors to Puerto Rico. Substantial research shows that multinational companies are increasingly taking labor laws into consideration when making business location decisions. Jurisdictions with lesser risks and costs are more attractive for job creating investors.<sup>37</sup>

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<sup>35</sup> Kugler (2004). See Dertouzos, James N., and Lynn A. Karoly. “*Labor market responses to employer liability.*” Rand Corporation, 1992; Autor, David H., William R. Kerr, and Adriana D. Kugler. “*Does Employment Protection Reduce Productivity? Evidence from U.S. States.*” The Economic Journal (2007): F189-F217; Heckman, James. Law and employment: Lessons from Latin America and the Caribbean. No. w10129. National Bureau of Economic Research, 2003; Kugler, Adriana D. “*The effect of job security regulations on labor market flexibility. Evidence from the Colombian Labor Market Reform.*” in Law and Employment: Lessons from Latin America and the Caribbean, pp. 183-228. University of Chicago Press, 2004

<sup>36</sup> Heckman, J. & Pages, C., 2004. *Law and enforcement: Lessons from Latin America and the Caribbean*, edited by James Heckman and Carmen Pages, University of Chicago Press. See also, Heckman, J. & Pages Serra, C., 2000. *On the cost of job security regulation: Evidence from Latin American Labor Markets*. *Economía*, 1 (1), 147.

<sup>37</sup> B.S. Javorcik & M. Spatareanu, *Do Foreign Investors Care About Labor Market Regulations?*, World Bank Policy Research Working Paper 3275, April 2004; Nicoletti, G., S. Golub, D. Hajkova, D. Mirza, G. and K. Yoo (2003). *The Influence of Policies on Trade and Foreign Direct Investment*, OECD Economic Studies, No. 36; .H. Parcon, *Labor Market Flexibility as a Determinant of FDI Inflows*, Department of Economics, University of Hawaii- Working Paper No.08-07 (2008); J. Mogab, R. Kishan, D.E. Vacaflores, *Labor Market Rigidity And Foreign Direct Investment: The Case Of Europe*, Applied Econometrics and International Development, Vol. 13-1 (2013); Bellak, C. and M. Leibrecht (2009), ‘*Does the impact of employment protection legislation on FDI differ by skill-intensity of sectors? An empirical investigation*’, GEP Discussion Paper 2009/21; W. W. Olney, *A Race to the Bottom? Employment Protection and Foreign Direct Investment*, Journal of International Economics, 91-2 (2013) pp. 191–203; Kandilov, Ivan T. & Senses, Mine Zeynep, *The*



**b. The basis for the labor reform’s projected impact is supported by case studies across a wide range of countries where similar reforms were successful in increasing growth.**

Labor market reforms taken in individual European countries have made the labor market more flexible, increased labor supply, and led to a long-run additional 3.5% annual growth in peripheral European countries, where economies are most similar to Puerto Rico. When excluding reforms not as relevant to Puerto Rican labor reform identified in the New Fiscal Plan, such as unemployment insurance and pension reform, the case studies still support an estimation of an additional 1.4% growth over the long-run, and key to the issue at hand is the finding that just the elimination of employment protection itself accounted for 0.5% of permanent growth.<sup>38</sup>

– For the EITC, in a study by the Central Bank of Malta (a country that is small and tied intimately to a very large neighbor in the EU, very much like the case of Puerto Rico), the EITC and welfare reform were linked to overall growth through increasing female labor force participation rates, which were found to result in an increase in growth of 0.8% per year.

– Spain’s 2012 labor reform law, enacted in response to the recession, loosened many of Spain’s restrictive employment protection policies, pushing it down below the OECD labor stringency average and potentially creating a 0.25% annual increase in business sector productivity, or 0.15% annual increase in GDP.<sup>39</sup>

– Estonia implemented reforms to ease hiring and dismissal procedures, as well as to allow the use of fixed-term contracts in all cases. These contracts are very similar to at-will employment. The reforms also cut severance payments. Estonia’s unemployment rate fell 5.5 percentage points from 19.8% to 13.3% between 2008 and 2011.<sup>40</sup>

– Influenced by the financial crisis, total employment in Portugal fell by 15% over 2008 to 2013. In response, Portugal made a series of structural reforms to reduce excessive employment protections. These included reducing severance pay and relaxing the definition of fair dismissal, but there is still more to be done to bring Portugal closer to the OECD average. The OECD estimates that new labor reforms have already begun contributing to increased labor productivity,

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*Effects of Wrongful Discharge Protection on Foreign Multinationals: Evidence from Transaction-Level Data*, Canadian Journal of Economics/Revue canadienne d'économique, Vol. 49, Issue 1, pp. 111-146, 2016.

<sup>38</sup> Derek Anderson et al, “Assessing the gains from structural reforms for jobs and growth,” International Monetary Fund.  
<https://www.imf.org/external/np/seminars/eng/2014/EURbook/pdf/7.pdf>

<sup>39</sup> The 2012 Labour Market Reform in Spain: A Preliminary Assessment, OECD, December 2013.  
<https://www.oecd.org/els/emp/SpainLabourMarketReform-Report.pdf>

<sup>40</sup> Brixiova, Zuzana and Balázs Égert, “Labour Market Reforms and Outcomes in Estonia,” William Davidson Institute, University of Michigan, February 2012.  
<https://deepblue.lib.umich.edu/bitstream/handle/2027.42/133043/wp1027.pdf?sequence=1>. Pp. 2-4.



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and could lead to a 0.5% increase in GDP by 2020.<sup>41</sup> Portuguese employment rates have also been growing stronger than forecasted.

– Comprehensive labor market reforms in Italy 2014 are expected to result in 0.6% GDP growth within 5 years, and 1.2% growth within 10 years. Reforms to trigger this growth include loosening employment protections, expanding active labor market policies, and increasing female workforce participation. These reforms will create an estimated 150,000 jobs in 5 years and 270,000 jobs in 10 years.<sup>42</sup>

– Slovenia introduced reforms in 2013 to make the labor market more flexible and to increase employment opportunities for younger workers. The OECD expects these reforms to boost Slovenian GDP by 0.2% in the first five years and by 0.3% in the first 10 years.<sup>43</sup>

– In Peru, a 10% increase in costs associated with employee dismissal reduced long-run employment rates by 11% between 1987 and 1990. The use of severance payments was also found to have a negative effect on employment levels.<sup>44</sup>

– The *Pacta por Mexico* introduced labor reforms alongside education, healthcare, and judiciary reforms. The OECD estimates that employment protection initiatives specifically will have contributed to about an 0.05% increase in GDP over 5 years.<sup>45</sup>

– Colombia reduced its employer payroll taxes, effectively making workers less expensive, and saw a decrease in the size of its informal labor market.<sup>46</sup>

– A 2017 survey of prominent economists regarding France’s labor laws – which are similar to those in Puerto Rico in mandating generous paid leave and strong employment protections –

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<sup>41</sup> “*Labour Market Reforms in Portugal 2011-2015: A Preliminary Assessment.*” OECD. <http://www.oecd.org/employment/emp/Labour-market-reforms-in-Portugal-2011-2015-preliminary-assessment.pdf>. P. 9.

<sup>42</sup> “*Italy Structural Reforms: Impact on Growth and Employment,*” OCED, February 2015. <http://www.oecd.org/italy/structural-reforms-in-italy-impact-on-growth-and-employment.pdf>

<sup>43</sup> “*Slovenia: The Growth Effects of Structural Reform,*” OECD, May 2015. <https://www.oecd.org/slovenia/slovenia-growth-effects-of-structural-reform-EN.pdf>

<sup>44</sup> Coudouel, Aline and Pierella Paci, “*Selected Labor Market Reforms,*” Analyzing the Distributional Impact of Reforms. Hosted by the World Bank. [http://siteresources.worldbank.org/INTPSIA/Resources/490023-1120845825946/3622-03\\_Ch03.pdf](http://siteresources.worldbank.org/INTPSIA/Resources/490023-1120845825946/3622-03_Ch03.pdf)

<sup>45</sup> *Towards a Stronger and More Inclusive Mexico: An Assessment of Recent Policy Reforms*, OCED, December 12, 2017. [https://www.oecd-ilibrary.org/economics/towards-a-stronger-and-more-inclusive-mexico\\_9789264189553-en](https://www.oecd-ilibrary.org/economics/towards-a-stronger-and-more-inclusive-mexico_9789264189553-en)

<sup>46</sup> Kugler et al (2017) found that a reduction in employer payroll taxes in Colombia reduced the size of the country’s informal labor market. Kugler, Adriana, Maurice Kugler, and Luis Omar Herrera Prada. “*Do payroll tax breaks stimulate formality? Evidence from Colombia’s reform.*” No. w23308. National Bureau of Economic Research, 2017



found two-thirds believe that reducing these labor laws would improve the country's economy and reduce the unemployment rate. Less than 5% of the economists surveyed disagreed.<sup>47</sup>

– In India, a 2004 study found that states with strict labor laws experienced lower manufacturing growth by around 23% to 24%; while states with more flexible legislation experienced increases by a similar amount.<sup>48</sup>

The reforms aimed at flexible labor regulations are expected to be successful in Puerto Rico due to key characteristics of the Island's economy that overlap with selected case studies. While there are numerous case studies that clearly demonstrate the positive effects of labor reform, the specific case studies used to support the transformational nature of these reforms in Puerto Rico were conducted in countries with key similarities to Puerto Rico.

- **Currency union:** Case studies utilized to reach impact estimates for labor reform were all derived from countries within currency unions. As a result, none had the ability to enact monetary policy that would bolster the impact of labor reforms, and they were still quite effective. Similarly, Puerto Rico's monetary policies are driven by the U.S. Federal Reserve.
- **Large informal economy:** In the periphery of the European Union, multiple countries such as Greece and Spain have informal economies that represent 20 - 30% of GDP. Thus, in both cases, moving firms and workers into the formal economy contributes toward the positive economic and fiscal impact of labor reforms. Reducing the size of informal economy also has a critical impact of increasing upward mobility and skill acquisition for low-wage workers in Puerto Rico.
- **Ease of capital flow:** Puerto Rico's unique status as a U.S. territory significantly eases the flow of capital and business from the mainland United States. As a result, a more flexible labor market offers the opportunity for Puerto Rico to attract firms from the mainland to open or expand operations on the Island. For example, France, which can attract investments from across Europe through its membership in the EU, saw a major spike in interest from business executives looking to invest in the country after President Macron successfully implemented labor reform. 60% of executives saw the country as an attractive place for companies in 2017, nearly triple the 2014 figure of 23%.
- **Large short-term stimulus:** Over the next 10 years, the Fiscal Plan projects over \$60 billion of disaster related funding to rebuild Puerto Rico. This funding is expected to produce an increase in demand, despite the long-term recession of Puerto Rico's economy. As a result, Puerto Rico will find itself at an opportune time to carry out such reforms (opposed to countries that enacted labor reforms during major economic downturns, such as Greece and Spain). The reforms should have a synergistic impact to the additional stimulus and provide a sound basis for future investors to come to Puerto Rico to establish

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<sup>47</sup> *IGM Forum: France's Labor Market*, Chicago Booth, May 17, 2017.  
<http://www.igmchicago.org/surveys/frances-labor-market>

<sup>48</sup> Besley, Timothy and Burgess, Robin, "Can Labor Regulation Hinder Economic Performance? Evidence from India," *Quarterly Journal of Economics*, Volume 119, Issue 1, 1 February 2004, Pages 91–134.



new businesses and hire workers. Change – even if necessary – can be disruptive, which is why it is best done during a time when the economy is expected to improve.

**c. Law No. 80 is part of the problem; not the only problem.**

**The repeal of Law No. 80 will not by itself cure the economic woes of the island. While significant, it is only one of the components of a Labor Reform Package that Puerto Rico needs to address. The change in the regime that regulates discharge decisions is part of a strategy to attract job creating investments to the Island. Moreover, the economic literature is clear--rules like Law No. 80 skew investments to capital-intensive operations and reduce in relative terms the demand for labor, which means Puerto Rico will continue its pattern of fewer employment opportunities.**

Puerto Rico needs to get the economy moving today. This will require hiring people at the lower end of the wage spectrum and getting them out of the informal economy and into formal jobs. This requires the effective implementation of the entire package of labor reform. Adopting the “at will” employment regime that has supported the substantially more successful economies of mainland states, is a necessary foundation to moving forward.

Much of the questioning in the public discourse has been around how the structural reforms, in particular labor, will positively impact Puerto Rico’s residents. The reality is that a single reform, in isolation from the rest, is not likely to impact growth substantially. Rather, it is the whole program and package of structural reforms that truly change the competitiveness of an economy. Puerto Rico, now more than ever, needs to focus on transforming the economy into one that is competitive.

**By putting the Puerto Rico labor market on a competitive footing with other U.S. jurisdictions, this will make the investment environment in Puerto Rico more competitive with those same U.S. jurisdictions. It is from the increased investment that the demand for labor will find its biggest boost and begin a virtuous cycle of investment, employment, growth and further investment. By focusing on changing Puerto Rico’s labor environment, new investors will be attracted to Puerto Rico given the confidence in a strong labor market that has flexible rules. By getting firms to invest, economic growth will be enabled.**

**d. Many employment protection laws will continue to apply**

Adopting the “at-will” employment regime will not diminish labor standards for workers in Puerto Rico. Moreover, they will continue to be protected by a very broad scope of antidiscrimination laws. Remedies under these laws are typically greater than the relief under Law No. 80. Excluding all applicable federal laws, Puerto Rico law will continue to prohibit the discharge of an employee for the following reasons:

- Because of age, race, color, sex (gender), sexual orientation, gender identity, social origin or condition, national origin, political or religious beliefs or affiliation, disability, marriage to an employee of the employer, being a victim or being perceived as a victim of domestic violence, sexual aggression or stalking,



present or prior military service, or veteran status.<sup>49</sup>

- Retaliation for having opposed sexual harassment in the workplace; having filed a complaint, testified or collaborated or participated in any manner in an investigation, proceeding or hearing in connection with a sexual harassment complaint.<sup>50</sup>
- For providing or intending to provide verbal or written testimony or information to an administrative, judicial, or legislative body in Puerto Rico, or in accordance with the employer's established internal procedures or before an employer's representative with authority, provided the expressions are nondefamatory and do not disclose legally protected confidential or privileged information.<sup>51</sup>
- For having (a) disclosed his/her salary to other employees or asked other employees about their compensation; (b) objected to any practice prohibited by Puerto Rico's Equal Pay Act (PREPA); (c) submitted a grievance or complaint regarding PREPA rights in any forum, or (d) offered or tried to offer, verbally or in writing, any testimony or information in an investigatory procedure against the employer regarding PREPA violations.<sup>52</sup>
- Dismissal, without just cause, of a pregnant employee.<sup>53</sup>
- For refusing to enter an alternate weekly work schedule agreement (which includes compressed workweeks) or for requesting the modification of the schedule, number of hours, or place of work as authorized under Puerto Rico's

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<sup>49</sup> Art. 1, Law No. 100 of June 30, 1959, as amended (Law No. 100), P.R. LAWS ANN. tit. 29, §146 (double damages and reinstatement); Art. 21, Law No. 69 of July 6, 1985, P.R. LAWS ANN. tit. 29, §1341 (double damages and reinstatement); Art. 13, Law No. 44 of July 2, 1985, as amended, P.R. LAWS ANN. tit. 1, §511 (double damages and reinstatement). A specific sexual harassment statute also provides a double damages remedy, which would be applicable in cases of sexual harassment discrimination, retaliation, or dismissals. *See* Art. 3 & 11, Law No. 17 of April 22, 1988, P.R. LAWS ANN. tit. 29, §§155b & 155j (double damages and reinstatement).

<sup>50</sup> Law No. 17 of April 22, 1988, P.R. LAWS ANN. tit. 29, §§155a *et seq.* (2017) (double damages and reinstatement).

<sup>51</sup> Law No. 115 of Dec. 20, 1991. P.R. LAWS ANN. tit. 29, §§194–194b (2016) (double damages and reinstatement). Article 2 of Law No. 80 has been amended on several occasions to provide a reinstatement and back pay remedy for wrongful discharges based on the same reasons. P.R. LAWS ANN. tit. 29, §185b (2016).

<sup>52</sup> Law No. 16-2017. P.R. LAWS ANN. tit. 29, §254 (2017).

<sup>53</sup> Art. 4, Law No. 3 of March 13, 1942, as amended, P.R. LAWS ANN. tit. 29, §469 (2017) (double damages and reinstatement).



overtime law.<sup>54</sup>

- Dismiss an employee working for the employer before the effective date of the “*Labor Transformation and Flexibility Act*” in or to hire a new employee at the lower vacation leave monthly accrual rates authorized for new hires.<sup>55</sup>
- Failing to reinstate, without just cause, a female employee returning from the statutory leave provided for maternity rest or after receiving a minor in her home for adoption.<sup>56</sup>
- For participating or having participated in jury duty or failing to reinstate an employee upon conclusion of such jury duty.<sup>57</sup>
- For providing or intending to provide verbal or written testimony or information to an administrative, judicial, or legislative body in Puerto Rico, provided the expressions are non-defamatory and does not disclose legally protected confidential or privileged information.<sup>58</sup>
- For refusing to lift objects that exceeds maximum weight limits established by law or regulation.<sup>59</sup>
- For refusing to grant payroll deduction authorization to support charitable institutions and/or community schools.<sup>60</sup>
- Interference with any military leave, discharge or failing to reinstate former

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<sup>54</sup> Law No. 4-2017, Art. 3.8, amending the second paragraph of Art. 14 and renumbering same as Art. 10 of Law No. 379 of May 15, 1948, as amended. P.R. LAWS ANN. tit. 29, §282 (2017) (potential double damages and reinstatement).

<sup>55</sup> Law No. 4-2017, Art. 3.18, amending subparagraph (b) of Article 5 of Law 180-1998, as amended. P.R. LAWS ANN. tit. 29, §250c(b) (2017) (double damages).

<sup>56</sup> Art. 2 and 4, Law No. 3 of March 13, 1942, as amended, P.R. LAWS ANN. tit. 29, §§467 and 469 (2017) (double damages and reinstatement).

<sup>57</sup> Law No. 87 of June 26, 1964, as amended, P.R. LAWS ANN. tit. 29, §152 (2017) (double damages and reinstatement); Art. 7 and 13, Law No. 281 of September 27, 2003, P.R. LAWS ANN. tit. 34, §§1735e and 1735k (2017) (double damages and reinstatement).

<sup>58</sup> Law No. 115 of December 20, 1991. P.R. LAWS ANN. tit. 29, §§194–194b (2017) (double damages and reinstatement). Article 2 of Law No. 80 has been amended on several occasions to provide a reinstatement and back pay remedy for wrongful discharges based on the same reasons. P.R. LAWS ANN. tit. 29, §185b (2017).

<sup>59</sup> Art. 3-A, Law No. 49 of May 22, 1968, as amended, P.R. LAWS ANN. tit. 29, §355a (2017) (double damages and reinstatement).

<sup>60</sup> Art. 5(j)(5) of Law No. 17 of April 17, 1931, as amended. P.R. LAWS ANN. tit. 29, §175(j)(5) (2017) (double damages).



employee upon conclusion of the military duty.<sup>61</sup>

- Dismissing or refusing to reinstate an athlete or trainer certified by the Puerto Rico Olympic Committee as athletes or trainers participating in certain sports events that require leaves of absence.<sup>62</sup>
- For filing a complaint against the employer under the Puerto Rico Occupational Safety and Health Act (PROSHA), having caused an investigation, testifying or intending to testify regarding matters covered under the act or failing to reinstate the employee after participating in a required medical examination.<sup>63</sup>
- Dismissing an employee, without just cause, while legally protected leaves for work-related and non-work-related disabilities under the workers compensation and non-occupational disability programs, as well as refusing to reinstate the employee after being released from treatment in accordance with the provisions of such laws.<sup>64</sup>

#### **e. Welfare Structure Reforms**

To implement the labor reform package, address labor market challenges and encourage residents to participate in the formal labor market, the Government must launch an Earned Income Tax Credit (EITC) program by January of 2019. The Government also must institute a work requirement for the Nutrition Assistance Program (PAN).

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<sup>61</sup> Art.4(f)(1) and Art. 9, Law No. 203 of December 14, 2007, as amended, P.R. LAWS ANN. tit. 29, §§737(f)(1) and 742 (2017) (triple damages and reinstatement); Art. 233, Law No. 62 of June 23, 1969, as amended, P.R. LAWS ANN. tit. 25, §2085 (2017) (back pay and reinstatement).

<sup>62</sup> Art. 5, Law No. 24 of January 5, 2002, P.R. LAWS ANN. tit. 15, §1111 (2017) (double damages and reinstatement).

<sup>63</sup> Art. 10(d) and Art. 29, Law No. 16 of August 5, 1975, as amended, P.R. LAWS ANN. tit. 29, §§361i(d) and 361aa (2017) (back pay, reinstatement, and other injunctive relief).

<sup>64</sup> Art. 5-A, Law No. 45 of April 18, 1935, as amended, P.R. LAWS ANN. tit. 11, §7 (2017) (damages and reinstatement); Art. 3(q), Law No. 139 of June 26, 1968, as amended, P.R. LAWS ANN. tit. 11, §203(q) (2017) (damages and reinstatement). A worker who regularly drives a motor vehicle to perform his job duties is exempt from Law No. 139, but receives similar reinstatement protections for disability absences under Article 16 of Law No. 428 of May 15, 1950, P.R. LAWS ANN. tit. 29, §693a (2017) (damages and reinstatement). If a person is unable to work due to an accident suffered while legally driving a motor vehicle on the public highways, similar job reinstatement protections are also available in accordance with another statute. Art. 4, Law No. 138 of June 26, 1968, as amended, P.R. LAWS ANN. tit. 9, §2054 (2017) (damages and reinstatement).



## **Earned Income Tax Credit (EITC)**

The EITC is a benefit for working people with low-to-moderate income. To qualify, people must meet certain requirements and file a tax return, even if they do not owe any tax. The EITC reduces the amount of taxes owed and may result in a cash refund if the benefit is higher than owed taxes.

Since welfare reform in 1996, the EITC has become the cornerstone of anti-poverty policy in the U.S. It has refocused the U.S. safety net on working families, dramatically increasing employment among single women with children and removing more children from poverty than any other program. In the U.S., this translates to approximately 6.5 million people (half of whom are children) lifted out of poverty. Further, the EITC improves employment rates (a \$1,000 increase in EITC benefit has been tied to a 7.3 percent increase in employment)<sup>65</sup> and provides increased opportunities for individuals to invest in their own futures with education, training, childcare, or other costs that improve longer-term outlook. It has proven a powerful incentive to transition into the formal labor force and file taxes.

From 2006 to 2014, Puerto Rico had a Worker's Tax Credit, which was later discontinued due to its ineffective application and as a cost-saving measure. This prior Work Credit applied to 45% of all tax filers at a cost of \$152 million in its last year of implementation. It was smaller than Federal EITC programs (\$150-450 versus ~\$2,000 average credit) and did not eliminate high implicit tax rates on low-income employees or do enough to incentivize formal employment.<sup>66</sup>

In Puerto Rico, implementation of the new EITC should be similar to the Federal EITC but adjusted to the relative wages of the Island. Eligible recipients should receive credits according to their marital, family, and earned income. As earnings increase, the benefit should increase up to a specified cap; at the cap, it would plateau and eventually decrease at the phase-out income level until it reaches \$0 (**Exhibit 5**), resulting in an average benefit of \$525.30 per individual per year. This structure diminishes the "benefits cliff" that many face as their earned income increases, rewarding citizens who participate in the formal economy.

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<sup>65</sup> Hoynes and Patel 2015, <http://www.taxpolicycenter.org/briefing-book/how-does-eitc-affect-poor-families>

<sup>66</sup> New York Federal Reserve Bank, 2014



**Exhibit 5: EITC Benefit Formula**

EITC Benefit Formula, \$

- Benefits begin with the first dollar of reported income. As income increases, **benefits also increase at the phase-in rate** (different depending on household size), **up to the maximum credit**
- When income **reaches the phase-in cap, the benefit increase ceases**. Benefits remain constant at income levels that fall between the phase-in cap and phase-out start
- When income **reaches the phase-out start, benefits begin decreasing at the phase-in rate** for each additional dollar earned, **until income reaches the income cap** (at which point benefits are \$0)

Number of Children	Phase-in rate, %	Phase-in cap, \$	Phase-out start, \$	Individual/ Single income cap, \$	Married income cap, \$	Maximum Credit, \$
0	5.00%	6,000	18,000	20,500	21,750	<b>300</b>
1	7.50%	12,000	13,000	20,500	24,250	<b>900</b>
2	10.00%	15,000	16,000	28,500	34,750	<b>1,500</b>
3 or more	12.50%	16,000	17,000	33,500	42,000	<b>2,000</b>

For example, a single mother with two children working at minimum wage for 35 hours per week earns approximately \$12,180 annually. With EITC, she can qualify for up to \$1,500 in additional take-home pay per year, effectively raising the minimum wage by more than 12%.

The EITC program would cost approximately \$200 million per year, but the program will raise formal labor force participation significantly, providing a positive return on the investment. The EITC must be implemented no later than FY2019.

**PAN Work Requirement**

While PAN, Puerto Rico’s largest welfare program, is similar to the mainland SNAP, it is funded and administered separately and unlike the mainland program PAN does not include a work requirement. As part of the labor reform package that the Oversight Board projects will create substantial growth over the next 30 years, the New Fiscal Plan requires that the Government institute work requirements to qualify for PAN benefits.

In FY2019, able-bodied participants aged 18-59 will be subject to a work requirement (children, even if their parents do not work, will continue to receive the benefit). Like mainland SNAP, in full implementation this work requirement must become effective after the individual has collected PAN benefits for three months. General exceptions would include those under age 18 or over the age of 60, parents with dependents under age 18, as well as those who are medically certified as physically or mentally unfit for employment. Paid work, voluntary work, training and education, and job searching (under the time limit) must qualify as work.

Any program savings derived from the PAN work requirement must be redistributed to working beneficiaries, effectively increasing take-home pay for workers. The increased worker benefit shall



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take place through an expansion of the Earned Income Disregard, which will increase the amount of earned income eligible recipients can exclude in calculating the amount of benefits they can claim. For example, a family of four currently receiving PAN will lose the benefit after exceeding a maximum annual income of \$5,904. By creating a sliding scale after this amount or allowing families to exclude a certain amount of earned income from this calculation, Puerto Rico can ensure no one is disadvantaged by seeking work in the formal economy and that no families lose benefits prematurely.

The increase in PAN benefits for workers combined with the EITC would improve conditions for low-income workers in the formal economy and reduce poverty.

The proposed PAN work requirements must be included in the new PAN annual plan submitted July 1, 2018 to Food and Nutritional Services. It will be phased in over two years. Beginning in FY2019, beneficiaries will be subject to the work requirement after 6 months of benefits. By FY2020, the full requirements will take effect, subjecting beneficiaries to the work requirement after 3 months of benefit collection.

### **Workforce Development Programs**

Labor and welfare reforms should increase supply and demand for jobs; to fully close the gap and implement the labor reform package, however, the Government must launch specific efforts to ensure that its future workforce is prepared with critical skills.

### **Workforce Innovation and Opportunity Act (WIOA)**

First, the Government must update the WIOA State Plan to focus its programs and incentives on high-priority sectors and capabilities. WIOA is the primary way in which the Federal Government invests in adult education and workforce development, and it is designed to help jobseekers access employment, education, and support services to succeed in the labor market, and to match employers with the skilled workers they need.

The Government must broaden the list of core industries that qualify under WIOA and focus on high impact economic sectors to provide a skilled workforce that meets the needs of employers in each specific region. It needs to integrate this WIOA program with the broader promotional efforts of the Department of Economic Development and Commerce (DDEC). For example, a MOE Agreement with the Puerto Rico Department of Labor and Human Resources must establish an apprenticeship program aiming to impact innovative industries and post-Maria labor market needs.

### **Youth Development Initiatives**

In addition to WIOA, the Government should help develop critical skills in the workforce through multiple proposed initiatives, including:

**Youth development:** Investment in STEM through targeted teacher professional development and related programs; apprenticeship programs through partnership with universities and local businesses; opportunities for work-based learning and business programs; occupational opportunities and certification programs (funded through reinvestment in additional surplus achieved through comprehensive labor reform).



**Higher education:** Curriculum development grants and scholarships for UPR students focused on high-impact sectors, e.g., the IT industry and Computer Science.

**Current labor market:** Apprenticeship Programs through collaboration with the private sector; training & certification programs focused on the areas of reconstruction efforts; creation of a job council to coordinate development and employment opportunities for youth and the unemployed.

By pursuing aggressive reforms to incentivize job creation and formal labor market participation, and to improve the overall quality of human capital in Puerto Rico, the Government will fundamentally transform the Island's labor market for the better.

## **VI. Comprehensive Set of Structural Reforms**

As previously mentioned, a single reform, in isolation from the rest, is not likely to impact growth substantially. Rather, it is the whole program and package of structural reforms that truly change the competitiveness of an economy. Puerto Rico, now more than ever, needs to focus on transforming the economy into one that is competitive. A sustainable fiscal and economic turnaround depends entirely on comprehensive structural reforms to the economy of Puerto Rico. Only such reforms can drive growth in the economy, reversing the negative trend growth over the last 10 years and enabling the Island to become a vibrant and productive economy going forward. To reverse the negative economic trends, reforms should be undertaken in the following areas:

**Human capital and workforce reforms** will improve workforce participation, well-being and self-sufficiency of welfare recipients, and preparedness of adults and youth for a long and fulfilling career, resulting in a cumulative GNP impact of 0.80% by FY2023. The impact is enhanced in the long-term as K-12 education reforms begin adding an additional 0.01% GNP impact per year, resulting in an additional 0.16% uptick by FY2048.

**Ease of doing business reforms** will improve conditions for economic activity and job creation, employment opportunities, and business vitality, resulting in cumulative GNP impact of 0.65% by FY2023.

**Power sector reforms** will improve availability and affordability of energy for families and businesses, resulting in 0.30% cumulative GNP impact by FY2023.

**Infrastructure reform and capital investment** will improve the flow of goods, services, and people across the Island. It has not been scored to provide a specific GNP uptick, yet is undoubtedly a consequential uptick in the Island's long-term development.

The timing and impact of structural reforms are based on work done by the IMF on similar reforms implemented in Europe, utilities reform in Latin America, and broadly accepted metrics for measuring improvement in the World Bank's Ease of Doing Business Rankings.

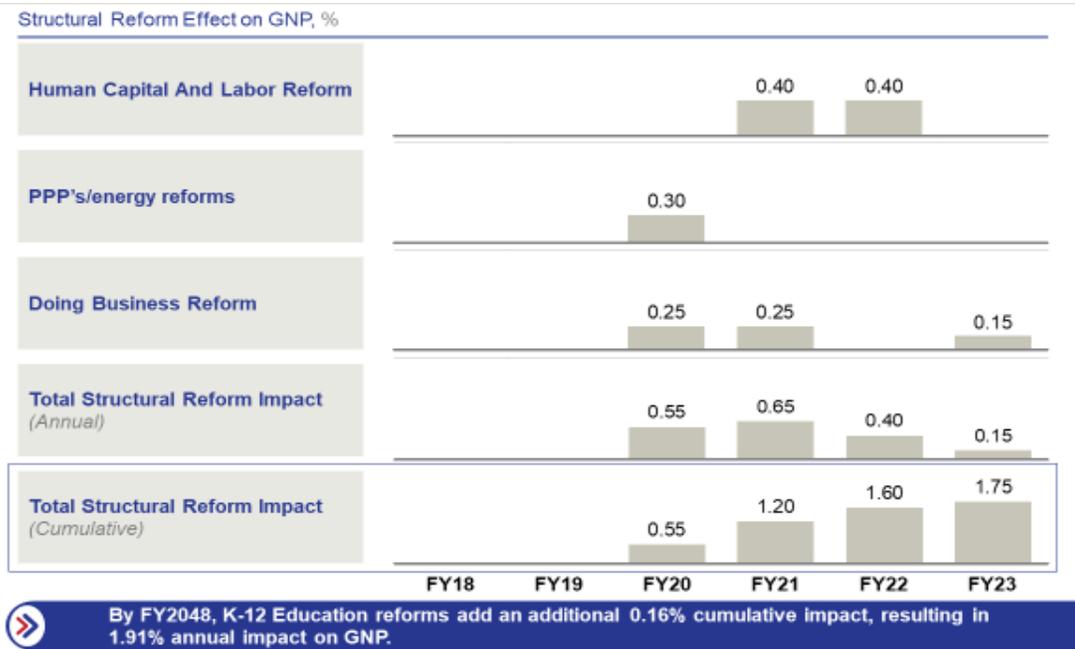
Structural reform benchmarks broadly come from nations or jurisdictions without monetary policy options, like Puerto Rico. Examples used include Eurozone nations, U.S. states, or countries that had currencies pegged to the United States Dollar – and therefore lack monetary flexibility as does Puerto Rico. If implemented effectively, labor, energy, and doing business, reforms are projected



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to increase GNP by 1.75% by FY2023. K-12 education reforms add an additional 0.01% annual impact beginning in FY2033, resulting in total GNP increase of 1.91% by FY2048 (**Exhibit 6**).

**Exhibit 6: Macroeconomic Impact of Structural Reforms**

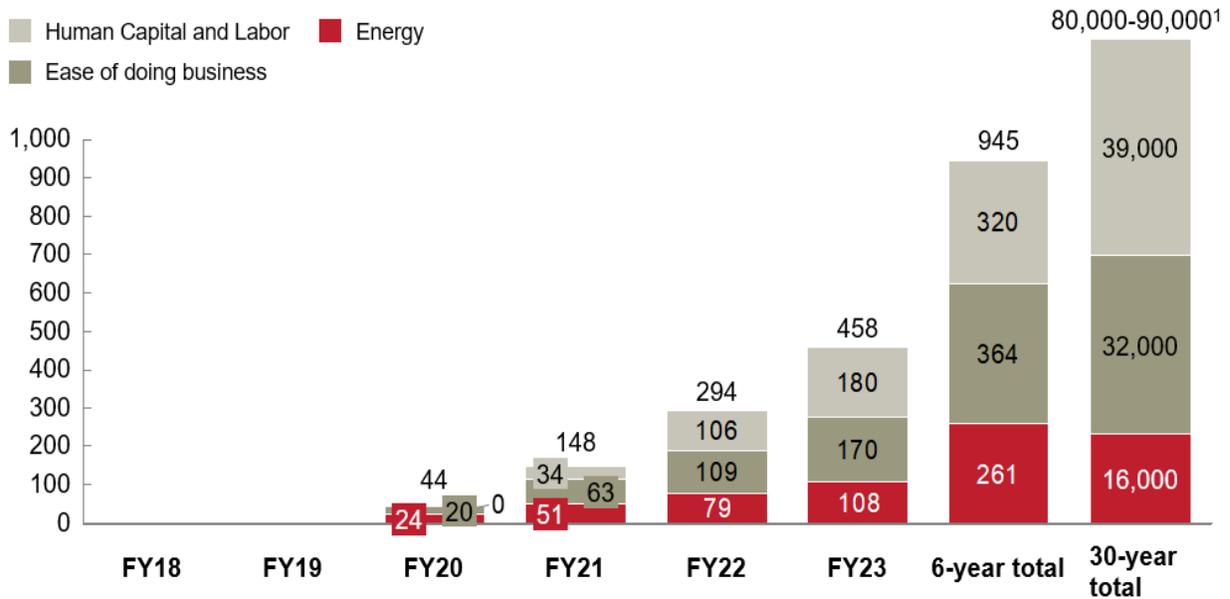


As shown below (**Exhibit 7**), these reforms equal approximately \$80-90 billion in increased Commonwealth revenues over 30 years. The reforms are crucial to placing Puerto Rico on a path to long-term structural sustainability.



**Exhibit 7: Impact of Structural Reforms Over 30 Years**

Impact of structural reforms, \$M

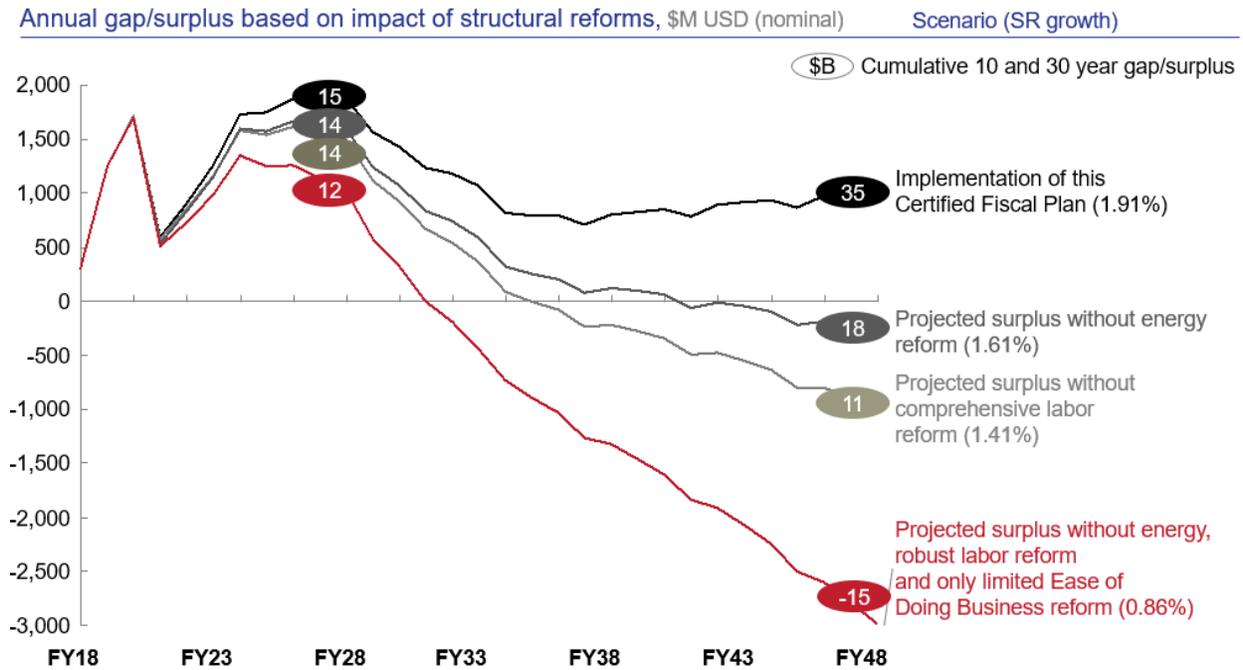


<sup>1</sup> Structural reforms in the 30-year are estimated due to macroeconomic compounding and long-term projection uncertainty

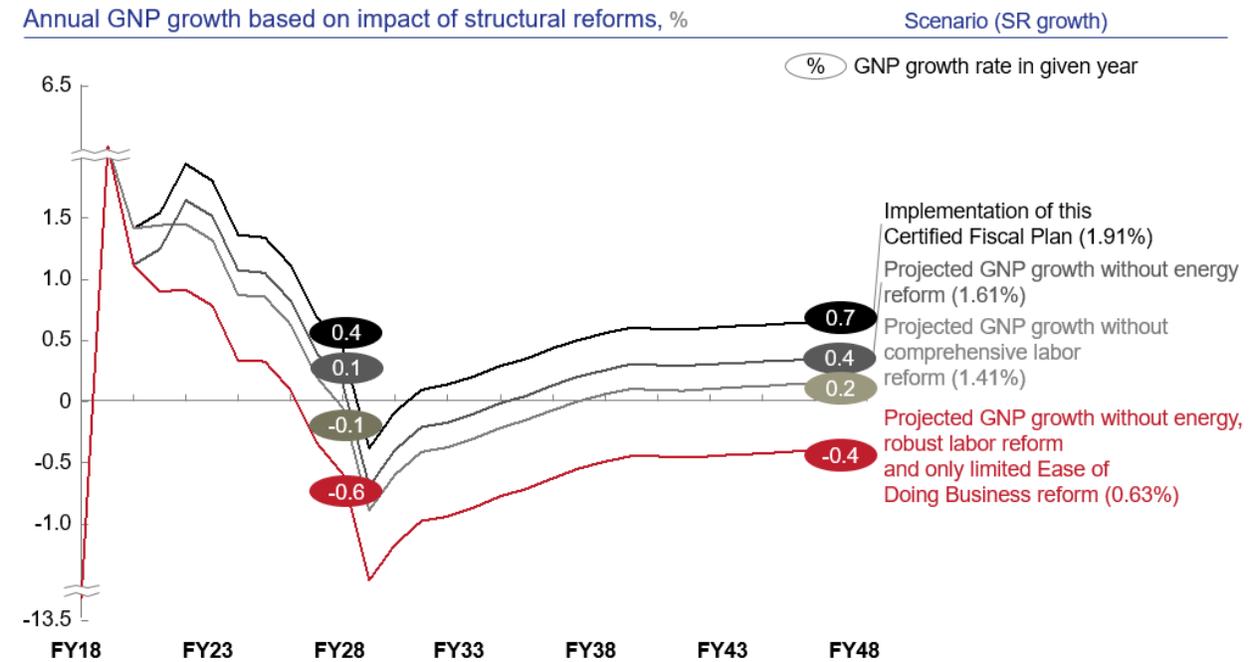
The entire package of structural reforms presents a transformational path for Puerto Rico, in which the long-term trend of decline turns into growth. However, without such structural reforms, there would be deficits by FY2032 (**Exhibit 8**). Similarly, this path ensures that the 1.91% impact from structural reforms by FY2023 will allow Puerto Rico to grow consistently thereafter; the path shown without the implementation of the reforms does not allow Puerto Rico to grow in the future (**Exhibit 9**). It is the full implementation of these reforms – human capital and labor, energy, and ease of doing business– that will allow the Island to achieve a sustainable economic future.



### Exhibit 8: Annual Gap/Surplus Pre-Debt Service Based on Impact of Structural Reforms



### Exhibit 9: Puerto Rico's GNP Outlook





## **VII. CONCLUSION**

As stated in the New Fiscal Plan, Puerto Rico will receive over \$60 billion of disaster related funding to rebuild the Island within the next 10 years. The federal funding will provide a cushion of time within which Puerto Rico must continue the hard work of making the necessary structural changes, reforms, and adjustments that will allow it to reverse the over a decade-long negative growth trend of the Puerto Rican economy, such that we can achieve fiscal balance, restructure the debt to sustainable levels, and return to capital markets.

Collectively, the labor reforms are transformational and will create opportunity for the future work force of Puerto Rico. The focus is to make Puerto Rico more competitive, and in turn create jobs, instill confidence, and change Puerto Rico's negative economic outlook trend to a positive one. The options are clear: full implementation of reforms present a path forward for Puerto Rico's GNP growth – one that will reawaken the economic prosperity Puerto Ricans have long been deprived of.

The New Fiscal Plan starts from the premise that the citizens of Puerto Rico deserve better – more opportunity for work, and an environment that is conducive to entrepreneurship and business creation. The reforms combine proven incentives for those who work, in the form of an Earned Income Tax Credit, with liberalization of the labor market rules that have made Puerto Rico out-of-step with U.S. states. Increasing labor force participation also levels the playing field by bringing workers from the informal sector into the formal economy, contributing to the Commonwealth's tax base needed to fund government services.

The implementation of the full range of structural reforms proposed in the New Fiscal Plan will prove to be transformational for Puerto Rico. The focus should be to implement this portfolio of reforms in its entirety to be able to deliver the maximum positive impact for the people – create more jobs and opportunity, instill confidence, strengthen the island's competitiveness and return the economy to growth mode, as well as to allow for a reasonable Plan of Adjustment that helps put an end to Title III court proceedings.



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# A Race to the Bottom? Employment Protection and Foreign Direct Investment

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## Abstract

A common critique of globalization is that it leads to a race to the bottom. This hypothesis assumes that multinationals invest in countries with lower regulatory standards and that countries competitively undercut each other's standards in response. This paper examines both assumptions and finds evidence of the first but no support for the second. Specifically, a reduction in employment protection rules leads to an increase in foreign direct investment (FDI). Not surprisingly, changes in employment protection legislation have a stronger impact on the relatively mobile types of FDI. However, there is no evidence that countries are competitively undercutting each other's labor market standards, despite the fact that doing so would attract FDI.

*Keywords:* foreign direct investment; employment protection; race to the bottom

*JEL Codes:* F16; F23

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# 1 Introduction

The race to the bottom hypothesis hinges on two important assumptions. First, it is assumed that multinational enterprises (MNE) choose to invest in countries with less restrictive standards. Second, it is assumed that foreign countries competitively undercut each other's standards in order to attract FDI. While a common critique of globalization is that it can lead to a race to the bottom, there is relatively little evidence supporting either of these key assumptions. This paper tests these predictions by examining the impact of employment protection legislation on FDI and by examining the impact of labor market standards in other countries on the employment protection legislation in the foreign host country.

The mobility of capital, and in particular FDI, has increased substantially in the last twenty five years. U.S. direct investment abroad as a share of gross domestic product has increased from 6% in 1982 to 25% in 2009. Advances in transportation and communication have allowed different production activities to be relocated abroad. However, labor market regulations, such as hiring and firing restrictions, will increase the costs of doing business in a particular foreign country. As employment protection rules become stricter in one country, multinationals will shift production activities to another relatively less costly location. Thus, according to the first assumption of the race to the bottom hypothesis, labor market restrictions will reduce FDI. Furthermore, the response of multinationals to employment restrictions likely depends on the type of FDI. Relatively more mobile types of FDI will have a greater ability to respond to changes in labor market restrictions than FDI that is tied to a specific location. For instance, vertical FDI, which is motivated by the desire to take advantage of low foreign factor prices, can be relocated to less expensive locations relatively easily. However, horizontal FDI, which is motivated by the desire to access a foreign market, needs to be near the foreign consumers.

The second key assumption of the race to the bottom hypothesis is that countries lower their labor standards in order to undercut their competitors and attract FDI. As the average labor standards in other foreign countries decreases, the foreign host country will lower their labor standards in response. Thus, the average employment restrictions in other

foreign countries should have a positive impact on the employment protection rules in the host country. While the intuition of the race to the bottom hypothesis is relatively straightforward, there is little empirical evidence to support either assumption.

This paper examines these predictions using data on FDI by U.S. multinationals and data on employment restrictions in twenty six foreign countries which collectively account for over three quarters of U.S. outward FDI. Focusing on U.S. FDI is appealing because it fixes parent country characteristics that may influence FDI. In addition, using detailed data from the Bureau of Economic Analysis (BEA) on foreign affiliate sales of U.S. multinationals allows horizontal, export-platform, and vertical FDI to be separately identified. The measure of employment protection used in this analysis is a composite index of hiring and firing costs obtained from the Organisation for Economic Co-operation and Development (OECD). This provides a consistent and objective measure of differences in employment protection legislation across countries and over time. Spanning twenty six countries and twenty three years, the data set provides the scale and scope necessary to examine both assumptions of the race to the bottom hypothesis.

To test the first assumption, the empirical analysis controls for time and country fixed effects and estimates the relationship between employment protection and FDI using ordinary least squares (OLS), dynamic panel generalized methods of moments (GMM), and instrumental variables (IV). The results in all specifications indicate that employment protection has a significant, negative impact on the foreign affiliate sales of U.S. multinationals. This is consistent with the prediction that labor market restrictions will increase the costs of production in the host country and thus reduce U.S. FDI to that foreign country.

Even more compelling is that the impact of employment protection varies across different types of FDI in the manner predicted. There is relatively little impact of employment restrictions on affiliate sales to the local market (horizontal FDI) but a more significant impact of employment restrictions on affiliate sales to other foreign countries (export-platform FDI). Finally, there is a large, negative, and significant impact of employment restrictions on affiliates sales back the U.S. (vertical FDI). These contrasting results, provide compelling evidence that labor market restrictions have the largest effect on the relatively more mobile types of FDI. Thus, there is evidence that FDI responds to labor market restrictions and

that this response is strongest among the most footloose types of FDI. This verifies the first assumption of the race to the bottom hypothesis and provides a motivation for countries to lower their employment protection rules.

The second key assumption of the race to the bottom hypothesis is that countries competitively undercut each other's labor market standards in order to attract FDI. To test this proposition, this paper examines whether host country employment protection legislation depends on changes in labor market standards in other foreign countries. Competitor's labor market standards are quantified as the average of employment protection in other foreign countries, which is calculated as an unweighted average, a weighted average based on distance, or a weighted average based on vertical and export-platform FDI. OLS, GMM, and IV results indicate that host country employment protection legislation does not depend on the employment restrictions in other foreign countries regardless of which weighting system is used. There is no evidence that countries are competitively undercutting each other's labor market restrictions, despite the fact that doing so would attract foreign direct investment. Thus, this paper finds evidence supporting the first assumption of the race to the bottom hypothesis but no evidence of the second assumption.

Additional results examine the relationship between employment protection and vertical FDI in greater detail. Specifically, findings indicate that employment protection rules decrease sales to U.S. parents and to a lesser extent sales to unaffiliated U.S. parties. In addition, sales of goods, rather than sales of services, are more responsive to employment restrictions. There is also evidence that both firing and hiring restriction have an important affect on vertical FDI, with the former having a larger negative impact than the latter. Finally, an alternate maximum likelihood estimation strategy is used to examine the robustness of the results that test the second assumption of the race to the bottom.

Multinationals play a crucial role in the increasingly integrated global economy. For instance, forty percent of all U.S. trade occurs within the boundaries of the firm (U.S. Census 2010). Understanding how multinationals decide where to locate production facilities is crucial in explaining trade flows and understanding the implications of globalization more generally. The determinants of FDI have been studied extensively (Carr et al. 2001, Markusen and Maskus 2002, Blonigen et al. 2007). These studies have convincingly shown

that foreign country characteristics such as GDP, skill level, trade costs, investment costs, and distance are important determinants of FDI. While the idea that multinationals are attracted to foreign countries with less restrictive labor standards is intuitive and is gaining traction in the popular press, relatively little is actually known about whether this is an important determinant of FDI. The results in this paper provide clear evidence that labor market restrictions have a significant effect on FDI.

Research on labor market restrictions typically focuses on the implications for employment (Lazear 1990, Acemoglu and Angrist 2001, Di Tella and MacCulloch 2005, Boeri and Jimeno 2005) and for output (Besley and Burgess 2004). An important contribution of many of these studies, relative to earlier work, is to look at within country variation using panel data rather than simply making cross country comparisons. In this paper, I also control for unobserved country characteristics but look at the global ramifications of employment protection. Given the increasingly integrated world economy and the growing importance of multinationals, it is also important to consider how employment restrictions will affect FDI.

The few studies that examine the link between employment protection and FDI generate mixed results. For instance, Rodrik (1996) and OECD (2000) find evidence that a decrease in labor standards reduces FDI, contrary to the predictions of the race to the bottom hypothesis. Bhagwati (2007) also argues that there is no evidence that multinationals are attracted to countries with lower labor standards. However, other studies find that less restrictive employment protection rules increase FDI (Gorg 2005, Dewit et al. 2009, Javorcik and Spatareanu 2005, Benassy-Quere et al. 2007). While similar in spirit, these papers typically rely on more ad hoc and subjective measures of hiring and firing costs than the employment protection measured used in this analysis. Furthermore, none of these papers examine the impact of labor market restrictions on different types of FDI. An important contribution of this paper is the finding that the impact of labor market restrictions on FDI depends crucially on the type of FDI.

While Azemar and Desbordes (2010) also look at different types of FDI, their measure of employment protection has no annual variation. In contrast, this paper exploits changes in labor market restrictions within a country over time. The ability to control for country

and year fixed effects and the ability to identify a causal impact of employment protection on FDI using the GMM and IV estimation strategies represent important contributions of this paper.

Tests of the race to the bottom hypothesis tend to focus on whether multinationals invest in countries with lower regulatory standards. As mentioned, the evidence regarding this first assumption is far from conclusive. However, tests of the second assumption of the race to the bottom hypothesis are even rarer. To the best of my knowledge, this is the only paper to examine whether countries competitively undercut one another's labor standards. Thus, this is the first comprehensive empirical test of the race to the bottom hypothesis.

The remainder of the paper proceeds as follows. Section 2 discusses the assumptions of the race to the bottom hypothesis. The estimation strategy is described in Section 3, while the data and descriptive statistics are presented in Section 4. The results are discussed in Section 5 and extensions are presented in Section 6. Finally, Section 7 concludes.

## **2 Race to the Bottom**

### **2.1 Assumption 1**

The first assumption of the race to the bottom hypothesis is that multinationals choose where to invest based in part on the employment restrictions within the foreign country. Fundamentally, stricter labor restrictions will impose additional costs on MNE and make investing in that particular country less appealing. In addition, FDI that is relatively more mobile, in the sense that it can be equally effective in a variety of different countries, should be more responsive to labor restrictions. As the costs associated with FDI increase due to employment protection legislation, the multinational will simply shift FDI to other countries. Thus, the responsiveness of FDI to employment protection legislation will depend crucially on the type of FDI.

Horizontal FDI occurs when a multinational invests in a country in order to access that foreign market and avoid transport costs associated with exporting the good from home (Markusen 1984). The MNE shifts the entire production process to the foreign country and then sells the output to local consumers. Thus, the decision to pursue horizontal FDI de-

depends on a "proximity-concentration trade-off" between the home and foreign country in which the benefits associated with being close to the foreign market need to be weighed against the costs associated with setting up production activities abroad (Brainard 1997). With horizontal FDI, the choice set facing the multinational is producing at home or producing in the foreign country whose market they want to access. Since other foreign countries are not a viable destination for FDI, horizontal FDI will be the least sensitive to employment protection legislation in the foreign country.

Export-platform FDI occurs when a multinational accesses a foreign market by setting up an affiliate in a neighboring country and exporting to the desired country (Ekholm, Forslid, and Markusen 2003, Yeaple 2003). The motivation is still to access a foreign market but now one foreign affiliate can export to a variety of neighboring countries. Thus, the multinational can access multiple markets with one well placed foreign affiliate. Under export-platform FDI, the relevant choice set facing the MNE is to produce at home and export or to produce in one of many potential host countries and export to multiple markets within a region. Since there are more options available to the MNE, export-platform FDI will be more sensitive to employment protection legislation than horizontal FDI.

Finally, vertical FDI occurs when multinationals invest in a country in order to take advantage of low foreign factor prices and minimize costs (Helpman 1984). The MNE shifts a part of the production activities to the foreign affiliate and then ships the output back to the home country for further processing or for final sales. Unlike horizontal and export-platform FDI which need to be near a specific foreign market, vertical FDI can be located in any foreign country regardless of location. The MNE simply chooses to invest in the country that generates the greatest cost savings. If the costs associated with operating in one foreign country increase, the MNE can shift these production activities to any other foreign country. Given that the motivation for vertical FDI is to take advantage of low foreign factor prices, vertical FDI will be especially sensitive to changes in the cost of production. Thus, relative to horizontal and export-platform FDI, vertical FDI will be the most responsive to employment protection legislation.

The key prediction is that the more footloose the FDI, the more sensitive FDI will be to increases in labor restrictions in the foreign country. As employment protection increases in

the foreign country, multinational will be reluctant to shift horizontal FDI elsewhere since that would defeat the main motivation of accessing that foreign market. However, with export-platform FDI the multinational has the ability to shift production to neighboring countries as labor restrictions increase. Finally, with vertical FDI the multinational has the ability to shift production to any other foreign country, regardless of location. The empirical analysis that follows examines whether FDI responds to employment protection legislation in this manner.

## 2.2 Assumption 2

The second assumption of the race to the bottom hypothesis is that countries competitively undercut each other's labor market standards in order to attract foreign investment. Given that FDI is often associated with increases in production, capital stock, infrastructure, and knowledge spillovers, attracting foreign investment is particularly appealing for foreign countries. If, according to assumption one, multinationals are attracted to countries with less restrictive labor standards, then each country has an incentive to lower their employment protection rules slightly below that of other countries. By undercutting the employment standards in other foreign countries, each host country has the ability to lure FDI away from its competitors. Thus, the second assumption of the race to the bottom hypothesis predicts that employment restrictions in a foreign country and the average labor standards in other countries are positively related. Specifically, as the weighted average of employment protection rules among a countries competitors falls the foreign country will reduce its own employment protections in response. The analysis that follows discusses how this weighted average is constructed and examines whether countries competitively undercut each other's labor standards.

## 3 Specification

### 3.1 Testing Assumption 1

The analysis begins by examining whether FDI is sensitive to changes in employment protection in the foreign host country. To test this first assumption of the race to the bottom

hypothesis, the following equation will be estimated using ordinary least squares (OLS):

$$(1) \quad FDI_{c,t} = \alpha_1 EP_{c,t-1} + X_{c,t-1} \alpha_2 + \lambda_c + \theta_t + \epsilon_{c,t}.$$

where  $FDI_{c,t}$  is U.S. foreign direct investment into country  $c$  in year  $t$ . The variable  $EP_{c,t-1}$  is employment protection in foreign country  $c$  and  $X_{c,t-1}$  is a vector of control variables that includes host country characteristics such as GDP, population, trade costs, skill level, tax rate, and investment costs. These variables are lagged to account for the fact that multinationals cannot immediately adjust FDI in response to these host country characteristics.<sup>2</sup> The natural log of all variables is used in the empirical analysis which allows for a more intuitive interpretation of the results. Finally,  $\lambda_c$  and  $\theta_t$  are country and year fixed effects respectively.

A second empirical strategy is to estimate a dynamic panel model, where current FDI depends on the lagged value of FDI. This accounts for the possibility that FDI is persistent over time. Thus, adding lagged FDI to equation (1) and first differencing leads to the following estimation equation:

$$(2) \quad \Delta FDI_{c,t} = \beta_1 \Delta EP_{c,t-1} + \Delta X_{c,t-1} \beta_2 + \beta_3 \Delta FDI_{c,t-1} + \Delta \theta_t + \Delta \epsilon_{c,t}.$$

where the country fixed effects are subsumed by the annual differences. The issue with estimating this equation is that the differenced residual,  $\Delta \epsilon_{c,t}$ , is by construction correlated with the lagged dependent variables,  $\Delta FDI_{c,t-1}$ , since both are functions of  $\epsilon_{c,t-1}$ . Similarly,  $\Delta EP_{c,t-1}$  and the control variables  $\Delta X_{c,t-1}$  may also be correlated with  $\Delta \epsilon_{c,t}$ . Therefore, OLS regressions of equation (2) can produce inconsistent estimates. To avoid this problem and to address potential endogeneity concerns, equation (2) will be estimated using the Arellano-Bond GMM estimator. This estimation strategy instruments the differenced variables that are not exogenous with their respective lagged levels (Holtz-Eakin, Newey,

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<sup>2</sup>The results are similar if these variables are not lagged.

and Rosen 1988, Arellano and Bond 1991). This allows a causal impact of employment protection legislation on foreign direct investment to be identified.

Despite the inclusion of country and year fixed effects, lagging all the independent variables, and using the Arellano-Bond GMM estimation strategy, there may be lingering endogeneity concerns.<sup>3</sup> To address these concerns, it is possible to estimate equation (1) using the instrumental variable (IV) estimation strategy. This third empirical strategy uses the unionization density and the political ideology and strength of the ruling party as instruments for employment protection legislation in the foreign host country. A country with a declining union presence may, as a result, see an increase in governmental employment restrictions. Thus, changes in union density will be an important predictor of the employment protection legislation implemented in the foreign host country. In addition, a country with a more liberal ruling party will be more likely to implement labor market restrictions. Thus, changes in the ruling party and its relative strength will be an important predictor of employment protection. These instruments will identify an exogenous source of variation in labor market restrictions which is unrelated to FDI. This mitigates endogeneity concerns and allows the impact of employment protection on FDI to be identified. The construction of both instrumental variables will be discussed in greater detail in Section 4.4.

Given the theoretical motivation discussed in Section 2, we would expect  $\alpha_1 < 0$  and  $\beta_1 < 0$ . As employment protection increases, the costs of operating a foreign affiliate increase, and thus FDI decreases as the multinational shifts these production activities elsewhere. In addition, the magnitude of  $\alpha_1$  and  $\beta_1$  will depend crucially on the type of FDI. Thus, all three empirical strategies will be separately estimated using total FDI, horizontal FDI, export-platform FDI, and vertical FDI as the dependent variables. The coefficients on employment protection should be more negative as the degree of mobility exhibited by each type of FDI increases. Specifically,  $\alpha_1$  and  $\beta_1$  will be most negative in the vertical FDI regression, it will be least negative in the horizontal FDI regression, and it will fall between these extremes in the export-platform FDI regression.

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<sup>3</sup>The race to the bottom hypothesis assumes that country's employment protection legislation reponds to other countries standards not one's own level of FDI. Furthermore, it is not entirely clear how FDI would affect employment protection legislation. Perhaps an increase in FDI encourages host countries to increase employment restrictions to protect local workers from being exploited by foreign multinationals or maybe increases in FDI encourage host countries to decrease employment restrictions to attract more FDI.

## 3.2 Testing Assumption 2

To test the second assumption of the race to the bottom hypothesis, this paper examines whether employment protection legislation is a function of employment protection in other foreign countries. Specifically, the following equation is estimated:

$$(3) \quad EP_{c,t} = \phi_1 \text{Competitor\_}EP_{c,t-1} + X_{c,t-1}\phi_2 + \phi_3 EP_{c,t-1} + \lambda_c + \theta_t + \epsilon_{c,t}.$$

where the dependent variable,  $EP_{c,t}$ , is employment protection in foreign country  $c$ .  $\text{Competitor\_}EP_{c,t-1}$  is the weighted average of employment protection in other foreign countries. This variable is constructed using three different weighting techniques which will be discussed in greater detail in the section that follows.  $X_{c,t-1}$  is a vector of control variables and the lagged value of employment protection is included as a regressor to account for the fact that employment protection rules are persistent over time.  $\lambda_c$  and  $\theta_t$  are country and year fixed effects respectively. Finally, all variables are in natural logs and the independent variables are lagged to account for the fact that changes in employment protection legislation take time to implement.

Equation 3 will be estimated using the OLS, Arellano-Bond GMM, and IV estimation strategies. The weighted average of the unionization and political ideology variables will be used as instruments in the IV regressions. If the race to the bottom theory is important, then  $\phi_1 > 0$ . As other foreign countries lower their employment protection rules, country  $c$  will respond by reducing its own employment protections in order to undercut its competitors.

## 4 Data

### 4.1 Foreign Direct Investment

Foreign direct investment is measured as U.S. direct investment abroad using data from the Bureau of Economic Analysis (BEA). Focusing on multinationals from one country is appealing because it minimizes parent country characteristics that may influence outward FDI. In addition, data on U.S. multinational companies is more comprehensive and detailed

than FDI data from other countries. There is little reason to believe that the determinants of U.S. FDI are fundamentally different from the decisions facing multinationals in other countries.

Another especially appealing aspect of the BEA data is that the measure of FDI used in this analysis (i.e. affiliate sales) allows for horizontal, export-platform, and vertical FDI to be separately examined. Specifically, the BEA identifies the ultimate destination of the sales by U.S. foreign affiliates. Affiliate sales to the local market measures horizontal FDI, affiliate sales to other foreign countries measures export-platform FDI, and affiliate sales back to the U.S. measures vertical FDI.<sup>4</sup> As mentioned before, the impact of employment protection on FDI should become more negative as the type of FDI becomes relatively more mobile. Finally, these FDI measures are converted into real dollars using the chain-type price index for gross domestic investment.<sup>5</sup>

## 4.2 Employment Protection

Data on employment protection comes from the Organisation for Economic Co-operation and Development (OECD). The OECD constructs a composite index of employment protection from seventeen individual measures of hiring and firing costs. These seventeen basic measures can be grouped into two broad categories, restrictions against firing workers and restrictions on hiring temporary workers. The firing restrictions include measures such as the notification process and timing of dismissals, the severance pay required, and the procedures for contesting an unfair dismissal. The hiring restrictions include measures such as the allowable number and duration of fixed term contracts, the type of work that temporary workers can do, and whether regular and temporary workers are treated equally.<sup>6</sup> The employment protection index is measured on a scale of zero to six with six representing the most restrictive rules.

While this composite index certainly does not capture all relevant factors that influence

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<sup>4</sup>There are many other types of 'complex' FDI that are variations of these three basic components (Yeaple 2003). While these three categories may include more complex types of FDI, this will not fundamentally change the basic ordering of these types of FDI from less-mobile to more-mobile.

<sup>5</sup>This price deflator is found in the Economic Report of the President (<http://www.gpoaccess.gov/eop/tables10.html>).

<sup>6</sup>For further details on the components of these measures and how they are calculated, see the methodology section of the OECD Indicators of Employment Protection website at [www.oecd.org/employment/protection](http://www.oecd.org/employment/protection).

labor market flexibility, it does have some appealing aspects. First and foremost, it is an objective and consistent estimate of employment protection regulations in a wide variety of countries. Changes in this measure of employment protection represent legislative and policy changes in the host country that are more likely exogenous to foreign affiliate sales.<sup>7</sup> Second, while this measure may not explicitly include all relevant labor market restrictions, it represents a useful proxy for the overall employment conditions in the host country. Third, it is possible to separate this index into its hiring and firing sub-categories which proves useful in the analysis that follows. Finally, this employment protection measure is available for thirty countries and twenty four years (1985-2008). The scale and scope of this variable represents an important improvement over other measures.<sup>8</sup>

### 4.3 Control Variables

The estimation strategy implemented in this analysis controls for both country and year fixed effects. To account for factors that may vary within a country over time, a variety of additional control variables are included that are likely to influence the decision of a multinational to pursue FDI. Perhaps most important is the host countries real GDP which is obtained from the OECD. The population of the host country also comes from the OECD. Following Blonigen et al. (2007), I measure host country trade costs as the inverse of the openness measure reported by the Penn World Tables (PWT).

Data on the host country skill level is obtained from the Barro and Lee (2010) Educational Attainment Dataset. They report the average year of schooling for those over 25 years old every five years from 1950-2010. The intervening years are calculated using linear interpolation. Host country corporate income tax rates come from the OECD. Investment costs in the host country are measured using data from the Business Environment Risk Intelligence (BERI). Investment costs are calculated as the inverse of the composite index which includes the operations risk index, the political risk index, and the remittance and

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<sup>7</sup>While changes in employment protection legislation is infrequent in some countries, when these changes occur they represent an important shift in labor market restrictions.

<sup>8</sup>Other authors (Gorg 2005, Dewit et al. 2009, Di Tella and MacCulloch 2005) have used data from the Global Competitiveness Report (GCR) produced by the World Economic Forum. This measure of hiring and firing costs is obtained from surveying local business managers about the hiring and firing practices in their country. This is relatively subjective and noisy measure which may not necessarily reflect changes in labor market legislation in the foreign host country.

repatriation factor index. Together, these control variables represent the factors that have been generally identified as important determinants of FDI.

#### 4.4 Instruments

The IV analysis uses the unionization density and the political ideology of the ruling party as instruments for employment protection. Data on the unionization rate in the foreign host country comes from the OECD and is calculated as the share of total wage and salary earners that are trade union members. As discussed previously, a lower unionization density increases the need for labor market regulations.

Data used to construct the political ideology variable comes from the Political Constraint Index (POLCON) Dataset (Henisz 2002). First, the political ideology of the political party that controls the executive branch of the government is identified. Each ruling political party is identified as liberal, neutral, or conservative. Then this ideology variable is interacted with a measure of political constraint which reflects the relative strength of the ruling party. Specifically, the political constraint variable takes into account the number of branches within the government that have veto power over policy changes, the party alignment across the branches of government, and the party heterogeneity within the legislative branches of government. This modified political ideology variable takes on values between one and three. Values close to three indicate that a relatively powerful liberal party is in control, values close to two indicate a relatively weak or neutral party is in control, and values close to one indicate that a relatively powerful conservative party is in control. A ruling party that is more liberal and powerful is more likely to implement employment protection legislation.

#### 4.5 Competitor Employment Protection

The employment protection measure from the OECD is used to construct the average of employment protection in other foreign countries. Specifically, for country  $c$  the *Competitor\_EP* variable is calculated as the weighted average of employment protection in all other foreign countries in the sample, not including country  $c$  itself. There are three different methods used to construct this average.

First, this variable is constructed as the unweighted average of employment protection in the other foreign countries. This method weights equally all other foreign countries. Second, *Competitor\_EP* is constructed using the inverse of distance between country  $c$  and the other foreign host countries as weights. The weights are normalized to one to account for the fact that the sample of countries changes over this period.<sup>9</sup> The employment protection legislation in countries that are closer in proximity to country  $c$  are weighted more heavily. Using the inverse of distance as weights is a common method for calculating spatial variables.

Rather than weighting countries that are closer in proximity more heavily, the third method weights more heavily those countries that are likely competing with country  $c$  for FDI. Specifically, the average vertical and export-platform FDI sales in each foreign country is used as a weight. The weights are normalized so that employment protection in those countries that have a greater share of vertical and export platform FDI sales are weighted more heavily. If these types of FDI are more mobile, then country  $c$  will be more responsive to changes in employment protection rules in countries that have a larger share of this type of FDI. In other words, these foreign countries will be the ones that country  $c$  is competing against to attract these relatively mobile types of FDI.

## 4.6 Descriptive Statistics

Combining these various measures, generates an unbalanced panel data set that spans twenty six countries and twenty three years (1985-2007).<sup>10</sup> The twenty six countries in this sample accounted for 78% of U.S. FDI in 2000. Table 1 reports the summary statistics of the variables used in this analysis. While the sample includes only OECD countries, Table 1 indicates there is substantial variation in all of these measures. For instance, real affiliate sales varied from \$1,165 million in Turkey in 1985 to \$586,295 million in the United Kingdom in 2007. On a scale of zero to six with six being the most restrictive, employment protection ranges from 0.6 in the United Kingdom in the 1990s to 4.2 in Portugal in the

<sup>9</sup>The results that follow are similar if the sample is restricted to countries that have data for the entire period.

<sup>10</sup>The countries include Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Mexico, New Zealand, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

late 1980s.

Figure 1 plots the annual average of employment protection against the annual average of real affiliate sales. A significant negative relationship between employment protection and affiliate sales is evident in Figure 1. Over time there has been a rough trend towards a decrease in employment protection rules and an increase in U.S. foreign affiliate sales.

Figure 2 plots the country average of employment protection against the country average of real affiliate sales. The U.K. and Canada have relatively lax employment protection rules and have high foreign affiliate sales. However, countries such as Portugal, Turkey and Greece have had strict employment protection rules and low levels of U.S. foreign affiliate sales. Perhaps not surprisingly, France and Germany have strict employment protection rules but high levels of affiliate sales. Again, there is a strong negative relationship between employment protection and affiliate sales. Countries that have strict employment protection rules typically have less U.S. foreign affiliate sales.

Figure 3 plots the country average of employment protection against the country average of different types of real affiliate sales. Two observations are worth noting. First, there is interesting variation across countries in terms of which type of FDI is most important. Not surprisingly, Japan and Australia have relatively large shares of horizontal FDI, Ireland and Switzerland have relatively large shares of export-platform FDI, and Mexico has a relatively large share of vertical FDI. Second, a negative relationship between employment protection and all three types of FDI is evident in Figure 3. However, it appears that the relationship between employment protection and vertical FDI is most negative, which is consistent with the intuition from Section 2.

Figures 1-3 provide insight into the dimensions and characteristics of the data set used in this analysis. It is interesting that such a strong negative relationship emerges in these basic scatter-plots. However, there are some important limitations of these scatter-plots which the empirical analysis that follows is able to overcome. First, the country and year fixed effects will capture much of the variation evident in these figures. The analysis that follows exploits country variation over time to examine the impact of employment protection on foreign affiliate sales. Second, these figures do not account for other factors that are changing over time and may be affecting both affiliate sales and employment protection.

As discussed previously, a wide array of control variables will be included in the empirical analysis. Third, this negative correlation does not imply causation. Fortunately, the GMM and IV estimation strategies will identify a causal impact of employment protection on foreign affiliate sales. With these caveats in mind, it is surprising that such a consistently negative relationship emerges in Figures 1-3. The section that follows examines whether this relationship is robust to a more careful and rigorous analysis.

Finally, Figure 4 reports the annual average of employment protection (solid line) and the 95% confidence intervals (dashed lines). The average employment protection in this sample of twenty six countries fell from 2.45 in 1985 to 2.00 in 2008, a reduction of 18%. In addition, the 95% confidence intervals converged over this time period which indicates that the variation in employment protection across countries decreased from 1985 to 2008. Both of these stylized facts are consistent with the second assumption of the race to the bottom hypothesis. However, this does not imply causation nor is it the only plausible explanation. The analysis that follows, identifies to what extent this reduction is driven by countries competitively undercutting each others labor standards.

## 5 Results

The goal of this analysis is to examine whether FDI responds to employment protection legislation and whether countries competitively undercut each other's labor standards. This section tests these two predictions of the race to the bottom hypothesis. First, the impact of employment protection restrictions on foreign affiliate sales to different locations is examined. Second, I examine whether countries competitively reduce their employment restrictions in response to changes in employment restrictions in other foreign countries.

### 5.1 Assumption 1 Results

The first assumption of the race to the bottom hypothesis is tested using the OLS, Arellano-Bond GMM, and IV estimation strategies. The OLS results obtained from estimating equation (1) are reported in Table 2. The results in column 1 indicate that more restrictive employment protection rules lead to a significant reduction in foreign affiliate sales. Given

the log-log specification, a 1 percent increase in employment protection leads to a 0.2 percent decrease in foreign affiliate sales. This is consistent with the idea that employment protection legislation increases the costs of operating in the host country and thus reduces U.S. FDI to that foreign country.

Columns 2-4 of Table 2 separate foreign affiliate sales by the ultimate destination of these sales. The results in column 2 indicate that employment protection reduces foreign affiliate sales to the local host country (horizontal FDI). The results in column 3 indicate that employment protection does not have a significant impact on foreign affiliate sales to other foreign countries (export-platform FDI). Finally, the results in column 4 indicate that employment protection has a large, negative impact on foreign affiliate sales back to the U.S. (vertical FDI). These findings provide preliminary support for the intuition discussed in section 2. Specifically, employment protection legislation has the strongest negative impact on the most mobile type of FDI. However, the GMM and IV estimation strategies will be better at identifying a causal impact of employment protection on FDI.

The coefficients on GDP, trade costs, skill, and investment costs are all significant and of the expected sign. Foreign direct investment increases with the size of the foreign economy, with reductions in trade costs, with reductions in the average skill level, and with reductions in investment costs. Consistent with other studies, GDP has a stronger positive impact on horizontal FDI while trade costs, skill, and investment costs have a stronger negative impact on vertical FDI. While the population and tax rate are typically thought to be important determinants of foreign direct investment, the coefficients on these variables are found to be insignificant. This may be because the country fixed effects and year fixed effects are capturing the variation in these control variable.

The Arellano-Bond GMM results obtained from estimating equation (2) are reported in Table 3. Employment protection has a negative impact on total foreign affiliate sales, but this relationship is only significant at the ten percent level (see column 1). More importantly, the impact of employment protection on different types of affiliate sales is consistent with the predictions from section 2. In column 2, employment protection does not have a significant impact on sales to the local market (horizontal FDI). This is consistent with the idea that horizontal FDI is not sensitive to host country employment protection restrictions. U.S.

multinationals want to access this foreign market and are thus relatively unresponsive to changes in employment protections in the host country.

In column 3, employment protection has a negative and significant effect on affiliate sales to other foreign countries (export-platform FDI). With export-platform FDI, U.S. multinationals can access a foreign market through a variety of different neighboring countries. Thus, as the employment protections become stricter in one host country, U.S. multinationals shift their affiliate production to another foreign country in that region.

In column 4, employment protection has large, negative, and significant impact on affiliate sales back to the U.S. (vertical FDI). Specifically, a 1 percent increase in employment protection leads to a 0.6 percent decrease in foreign affiliate sales to the U.S. With vertical FDI, U.S. multinationals are not constrained geographically by the need to access a foreign market. Thus, if the costs of operating foreign affiliates increase due to employment protection restrictions, the U.S. multinational simply relocates affiliate production to another cheaper foreign location. Finally, the lagged sales coefficients in all regression in Table 3 are positive and significant which indicates that sales are persistent over time. The high p-values on the Hansen J and second order autocorrelation (AR2) tests indicate that the lags of the dependent variables are in fact exogenous and are thus good instruments.<sup>11</sup>

Finally, equation (1) is estimated using the IV estimation strategy. Table 4 reports the first stage IV results for all four sales regressions.<sup>12</sup> As expected, the unionization rate has a negative affect on employment protection. As the prevalence of unions decreases, there is more need to protect workers through government imposed labor market restrictions. Also consistent with expectations, the political ideology variable has a positive impact on employment protection. A strong liberal government is more likely to implement labor market restrictions. The F-stat on the excluded instruments is above 40 in all the regressions, which indicates relatively strong instruments.

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<sup>11</sup>However, the Hansen J test can be weakened when, as a rule of thumb, the number of instruments exceeds the number of groups (i.e. countries). This is the case in this analysis because there are a relatively large number of years which increases the instrument matrix. However, this does not affect the coefficient estimates (Roodman 2006) and the results in Table 3 are not sensitive to reducing the number of lagged instruments used in the GMM estimation strategy.

<sup>12</sup>Although similar, the first stage results are not the same for the different IV regressions because the sample size changes depending on which foreign affiliate sales dependent variables is used in the second stage.

The second stage IV results are reported in Table 5. Once again, employment protection decreases foreign affiliate sales. Furthermore, consistent with expectations, employment protection has a progressively more negative impact on local sales, foreign sales, and U.S. sales. Not surprisingly, employment protection legislation has the most negative impact on the relatively more mobile types of FDI. In addition, the magnitudes are large. A 1 percent increase in employment protection leads to a 3 percent decrease in affiliates sales back to the U.S. Vertical FDI is most sensitive to labor costs in foreign countries and thus labor market restrictions have the largest impact on this type of FDI. Finally, the overidentification test (i.e. the Hansen J p-value) indicates that the instruments are uncorrelated with the error term and are thus valid instruments. The results in Table 5 provide clear and convincing evidence that FDI decreases with employment protection legislation in the foreign host country.

Overall, the results in Tables 2-5 support the first assumption of the race to the bottom hypothesis. As employment protection legislation decreases, foreign direct investment increases. In addition, as the type of FDI becomes more mobile, the relationship between employment protection and foreign affiliate sales becomes larger in magnitude and more significant. This is an important result and indicates that the multinational response to employment protection depends crucially on the type of FDI. Furthermore, these key results are robust across the OLS, GMM, and IV estimation strategies.

## 5.2 Assumption 2 Results

The results so far indicate that FDI, particularly export-platform and vertical FDI, increases as employment restrictions are relaxed. This provides a motivation for foreign host countries to competitively undercut each other's labor standards. To test this second key assumption of the race to the bottom hypothesis, equation 3 estimates the impact of employment protection rules in competing foreign countries on the host country's own employment protection legislation. The results of this analysis are reported in Tables 6, 7, and 8.

Table 6 reports the results when *Competitor\_EP* is constructed as an unweighted average of other foreign country's employment protection rules. Column 1 reports the OLS results, column 2 reports the Arellano-Bond GMM results, and column 3 reports the

IV results using the unweighted average of *union* and *ideology* as instruments.<sup>13</sup> In all regressions, the coefficient on lagged *Competitor\_EP* is insignificant. If the race to the bottom theory was important we would expect this coefficient to be positive and significant. A reduction in their competitor's labor standards would lead to a reduction in the foreign host countries employment restrictions. The lack of significant findings casts doubt on the assumption that countries are competitively undercutting each other's labor standards.

Table 7 shows the estimation results when *Competitor\_EP* is constructed as a weighted average using the inverse of distance between the two foreign countries as the weights. This places more emphasis on employment protection rules in foreign countries that are in close proximity to the foreign host country. The results in Table 7 once again indicate that, regardless of the estimation strategy used, *Competitor\_EP* has no significant impact on employment protection in the host country. However, the strong positive impact of lagged host country employment protection on current employment protection indicates that these labor standards are persistent over time.<sup>14</sup>

As discussed in section 4.5, it is also possible to construct *Competitor\_EP* using the share of average vertical and export-platform sales as weights. The first part of this paper finds that these types of FDI are most sensitive to changes in employment protection legislation. Rather than weighting countries based on geographic distance, this method weights more heavily employment protection in those foreign countries that have a larger share of these relatively mobile types of FDI. Presumably these are the foreign countries that the foreign host country is competing against for U.S. FDI. Table 8 reports the results using *Competitor\_EP* constructed in this manner. Again, the coefficient on *Competitor\_EP* is insignificant in the OLS and GMM specifications. However, it is significant and negative in the IV regression. This suggests that as the employment protection legislation in other foreign countries decreases, the employment protection rules in the host country increase. Thus, if anything, this finding works against the second assumption of the race to the bottom hypothesis.

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<sup>13</sup>The first stage F-stat and the overidentification test in this IV regression indicates that these instruments are relatively weak.

<sup>14</sup>In addition, it is important to include the lagged host country employment protection as an additional control because the host country's EP level is not included in the calculation of *Competitor\_EP*.

Overall, there is no evidence that countries competitively undercut each other's labor standards, despite the fact that doing so would increase inward FDI. Perhaps changing economy wide labor standards is too blunt a tool to attract foreign investment. This key finding is robust to three different methods of constructing the competitor's employment protection variable and to three different estimation strategies. While there is evidence supporting the first assumption of the race to the bottom hypothesis, there is no evidence supporting the second assumption.

## 6 Extensions

The following extensions provide additional insight into the relationships between FDI, host country employment protection, and competitor's employment protection rules. Specifically, different components of affiliate sales to the U.S. and employment protection rules are examined. In addition, an alternate specification is used to test the second assumption of the race to the bottom hypothesis.

### 6.1 Affiliate Sales to the U.S.

Employment protection regulations have the strongest impact on foreign affiliate sales back the U.S. It is possible, given the BEA data, to take a closer look at the type of affiliate sales back to the U.S. most affected. Specifically, affiliate sales can be separated into those going to the U.S. parent and those going to unaffiliated U.S. parties. In addition, affiliate sales are separated into the sale of goods and the sale of services back to the U.S. The results using the IV estimation strategy are reported in Table 9.

The results using foreign affiliate sales to the U.S. parent as the independent variable are reported in column 2 and the results using foreign affiliate sales to unaffiliated U.S. parties as the independent variable are reported in column 3. The coefficients on employment protection are negative, significant, and similar in magnitude in both specifications. A 1 percent increase in employment protection leads to a 3.0 percent decrease in sales to the U.S. parent and a 2.6 percent decrease in sales to unaffiliated U.S. parties. If anything, employment protection has a slightly more negative impact on affiliate sales back to the

U.S. parent. This suggests that FDI whose output is shipped back to the U.S. parent for further processing is more mobile than FDI whose output is sold to U.S. consumers.

Columns 4 and 5 of Table 6 compare affiliate sales of goods and services back to the U.S. The results indicate that the sale of goods decreases in response to employment protection but there is no significant impact on the sale of services. While this points to an interesting distinction between affiliate sales of goods and services, these results should be interpreted with caution since data on affiliate sales of services is notoriously difficult to measure.

## 6.2 Employment Protection Components

Having taken a closer look at the dependent variable of interest, we now turn to the key independent variable (employment protection). As discussed previously, the employment protection measure from the OECD is an average of firing and hiring costs assembled from seventeen individual components. It is possible to separately examine the impact of firing restrictions and hiring restrictions on the foreign affiliate sales to the U.S. By definition these firing and hiring components have less variation than the composite index. However, no change in these employment restriction measures within a country still represents an important source of variation or counterfactual in this analysis.

Table 10 reports the IV estimation results from regressing U.S. sales on the firing and hiring components of employment protection. The results in columns 2 and 3 indicate that both firing and hiring costs decrease vertical FDI. A 1 percent increase in firing restrictions decreases affiliate sales to the U.S. by 4.3% and a 1 percent increase in restrictions on hiring temporary workers decrease affiliate sales to the U.S. by 2.3%. The slight difference in the size of the coefficients suggests that firing restrictions are a greater deterrent for FDI than restrictions on hiring temporary workers. However, overall, the additional costs associated with both firing and hiring workers leads U.S. multinationals to relocate their affiliate production activities elsewhere.

## 6.3 Contemporaneous Competitor Employment Protection

The results reported in Tables 6-8 assumed that there is a lag in the response of host countries employment protection rules to changes in their competitor's employment protection

rules. It is assumed that it takes time for countries to respond to their competitor's actions and to implement these changes. However, if the host country can anticipate changes in labor standards in other foreign countries, then the host country can respond quickly by lowering its own standards within the given year. While somewhat less plausible, this section examines this possibility in greater detail.

To test for this possibility, the following spatio-temporal model is estimated:

$$(4) \quad EP_{c,t} = \rho \cdot W \cdot EP_{c,t} + X_{c,t-1}\phi_2 + \phi_3 EP_{c,t-1} + \lambda_c + \theta_t + \epsilon_{c,t}.$$

This is similar to equation 3 except now the components of the contemporaneous *Competitor\_EP*, the spatial autoregressive term, is explicitly stated as the product of the spatial lag weighting matrix,  $W$ , and employment protection. As discussed before,  $W$  is constructed as the row normalized unweighted average, the row normalized weighted average using the inverse of distance, and the row normalized weighted average using average affiliate sales. Finally,  $\rho$  is the parameter to be estimated. While similar to equation 3, this notation is used here to be consistent with the spatial econometrics literature.

This equation is estimated using the maximum likelihood (ML) estimation strategy (Blonigen et al. 2007). OLS estimates of equation 4 are inconsistent because by construction the spatial autoregressive term and the error term are correlated. However, this is not a problem if the spatial autoregressive term is temporally lagged, as is the case in equation 3 (Franzese and Hays 2008).

The results from estimating equation 4 are reported in Table 11. *Competitor\_EP* is now contemporaneous while all other control variables remain temporally lagged. The results indicate that changes in the competitor's employment protection rules has a negative and significant impact on the host country's employment protection rules. This result is not sensitive to the weighting method used to construct the  $W$  matrix. This is a somewhat surprising result and is at odds with the second assumption of the race to the bottom hypothesis which predicts a positive coefficient. Specifically, we would expect that reductions in competitor's labor standards would cause the host country to competitively lower

their own labor standards in response. Instead, the results in Table 11 indicate the exact opposite. The host country raises their labor standards in response to lower competitor labor standards. This interesting result warrants further examination which is left to future research. For the purposes of this paper, these results confirm earlier findings and once again indicate that there is no evidence that countries are competitively undercutting one another's labor standards.

## 7 Conclusion

There are two implicit assumptions in the race to the bottom hypothesis. The first assumption is that multinationals will increase their foreign investment in response to reductions in employment protection in the host country. Furthermore, the relatively mobile types of FDI will be most responsive to employment protection rules. The second assumption is that countries competitively undercut each other's labor standards in order to attract FDI.

The empirical results presented in this paper confirm the first assumption. Specifically, there is a significant negative impact of employment protection on FDI. A reduction in employment protection rules leads to an increase in foreign affiliate sales. In addition, this negative relationship is strongest among the most mobile types of FDI. Employment protection legislation in the host country has limited impact on horizontal FDI, a more substantial negative impact on export-platform FDI, and a large, negative impact on vertical FDI.

Despite the fact that lowering employment restrictions increases FDI, there is no evidence that countries are competitively undercutting each other's labor standards to attract foreign investment. Specifically, this paper examines whether labor standards in other foreign countries affect the employment restrictions in the foreign host country. Regardless of the weighting method used to construct the foreign countries' labor standards or the estimation strategy, there is no significant impact on the host country's employment protection rules. Overall, this paper finds support for the first proposition of the race to the bottom hypothesis but no evidence of the second assumption.

Whether this is a desirable outcome depends on one's view of employment protection.

If labor market restrictions are necessary to protect the rights of workers, then this is an encouraging result. Although multinationals are investing in countries with the least restrictive regulatory conditions, there is no evidence that this is promoting a race to the bottom. However, if labor market restrictions are undesirable and hinder economic flexibility and growth, then the finding that countries are not competitively lowering employment restrictions is discouraging. Although attracting foreign investment provides an incentive for countries to liberalize their labor markets, to date countries are not competing with one another to do so. Regardless of one's perspective on labor market restrictions, this paper provides important evidence that FDI does respond to regulatory standards but that countries are not competitively lowering standards to attract FDI.

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TABLE 1

Summary Statistics					
Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Total Affiliate Sales (\$m)	556	71,364	96,918	1,165	586,295
Employment Protection	560	2.204	0.971	0.600	4.190
GDP (\$m)	582	627,057	709,352	43,425	3,618,565
Population (thousands)	598	31,543	31,937	3,272	127,787
Trade Costs	593	0.021	0.011	0.006	0.068
Skill	598	9.4	1.9	4.0	13.1
Tax Rate	549	33	10	9	56
Investment Costs	590	0.018	0.003	0.012	0.027
Union	558	35	20	7	84
Ideology	590	2.1	0.5	1.2	3.0

The sample includes 26 OECD countries and 23 years (1985-2007).

FIGURE 1

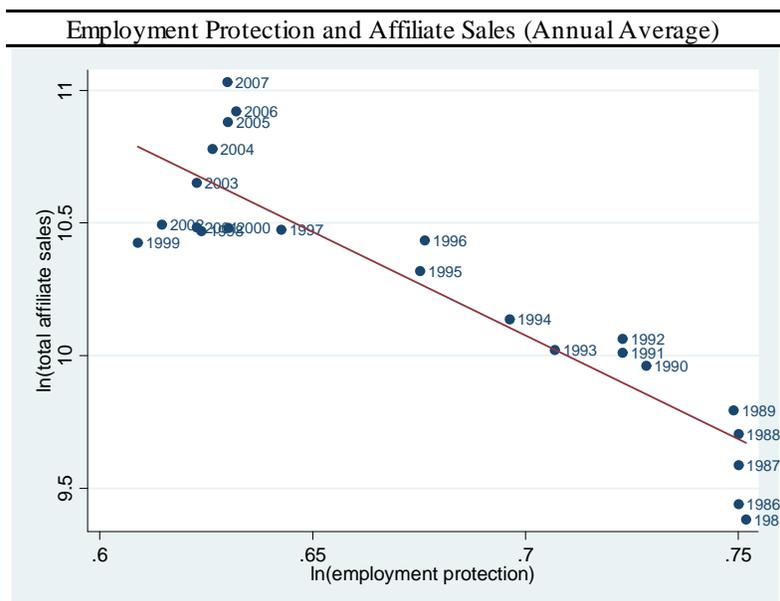


FIGURE 2

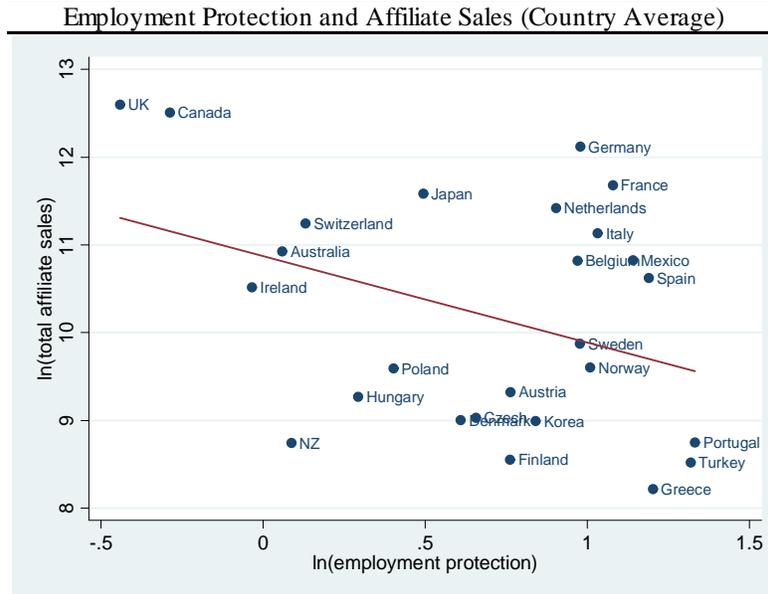


FIGURE 3

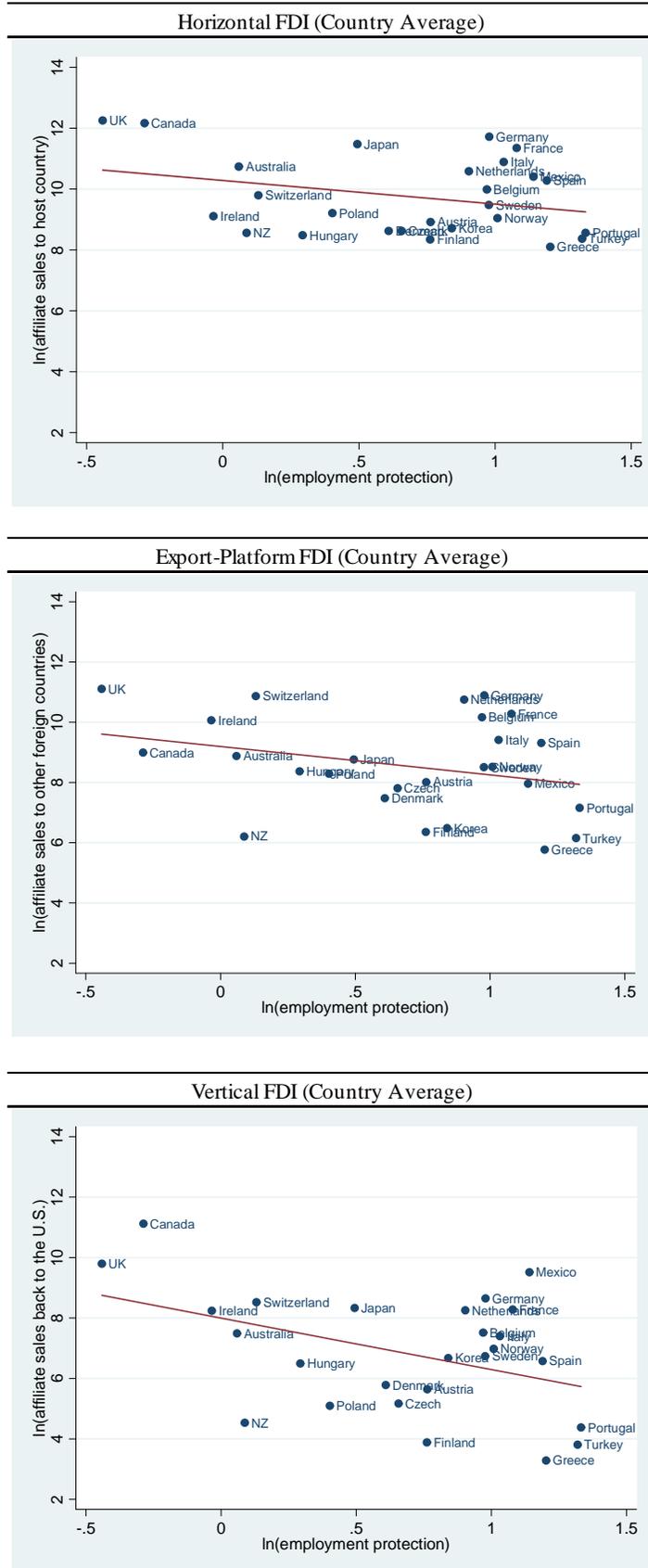
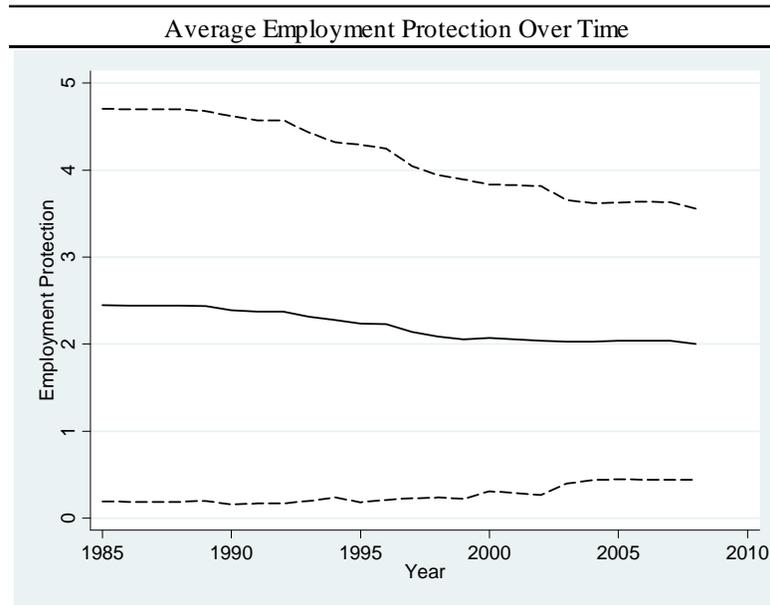


FIGURE 4



The solid line represents the mean of Employment Protection by year. The 26 OECD countries are included in this mean, although not all countries span the entire sample. The dotted lines represent the 95% confidence intervals.

TABLE 2  
Foreign Affiliate Sales by Destination (OLS)

Lagged Independent Variables	Total Sales	Local Sales	Foreign Sales	U.S. Sales
Employment Protection	-0.178*** [0.056]	-0.186*** [0.049]	-0.099 [0.133]	-0.638*** [0.220]
GDP	1.567*** [0.130]	1.887*** [0.137]	-0.025 [0.337]	0.894 [0.674]
Population	-0.284 [0.424]	0.015 [0.443]	1.083 [0.866]	-2.008 [1.233]
Trade Costs	-0.838*** [0.119]	-0.500*** [0.122]	-2.350*** [0.279]	-2.278*** [0.481]
Skill	-0.923*** [0.136]	-0.574*** [0.122]	-2.022*** [0.356]	-2.855*** [0.696]
Tax Rate	-0.087 [0.061]	-0.046 [0.053]	-0.102 [0.136]	-0.591** [0.247]
Investment Costs	-0.397** [0.160]	-0.331** [0.167]	-1.846*** [0.598]	-3.747*** [1.203]
Observations	490	472	482	464
R-squared	0.99	0.99	0.96	0.92

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country and year fixed effects are included in all regressions. The dependent variable is U.S. foreign affiliates sales. Total Sales are affiliate sales to all locations, Local Sales are affiliate sales within the host country, Foreign Sales are affiliate sales to other foreign countries not including the U.S. or the host country, and U.S. sales are affiliate sales back to the U.S.

TABLE 3  
Foreign Affiliate Sales by Destination (Arellano - Bond GMM)

Lagged Independent Variables	Total Sales	Local Sales	Foreign Sales	U.S. Sales
Employment Protection	-0.096* [0.052]	-0.071 [0.069]	-0.202** [0.083]	-0.565*** [0.175]
GDP	0.323** [0.155]	0.524*** [0.151]	0.304 [0.212]	1.334** [0.535]
Population	0.133 [0.320]	-0.059 [0.306]	0.985* [0.533]	-1.288 [0.941]
Trade Costs	-0.214* [0.117]	-0.365*** [0.102]	-0.603*** [0.196]	-0.623** [0.253]
Skill	-0.411*** [0.118]	-0.453*** [0.116]	-0.531** [0.207]	-0.933** [0.427]
Tax Rate	-0.004 [0.048]	-0.056 [0.049]	0.063 [0.078]	-0.084 [0.148]
Investment Costs	0.087 [0.148]	0.078 [0.138]	0.156 [0.230]	-0.511 [0.564]
Total sales	0.803*** [0.032]			
Local sales		0.698*** [0.044]		
Foreign sales			0.681*** [0.036]	
U.S. sales				0.561*** [0.118]
Observations	461	420	437	400
Hansen J p-value	1	1	1	1
AR2 p-value	0.50	0.09	0.18	0.94

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Year fixed effects are included in all regressions. The dependent variable is U.S. foreign affiliates sales. Total Sales are affiliate sales to all locations, Local Sales are affiliate sales within the host country, Foreign Sales are affiliate sales to other foreign countries not including the U.S. or the host country, and U.S. sales are affiliate sales back to the U.S.

TABLE 4  
First Stage IV Results (Dependent Variable: Employment Protection)

Lagged Independent Variables	Total Sales	Local Sales	Foreign Sales	U.S. Sales
Unions	-0.418*** [0.045]	-0.410*** [0.046]	-0.420*** [0.047]	-0.412*** [0.047]
Ideology	0.070*** [0.023]	0.067*** [0.023]	0.070*** [0.023]	0.067*** [0.023]
Observations	482	464	474	456
R-squared	0.97	0.97	0.97	0.97
Cragg-Donald F Stat, Instruments	44	43	43	42

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country fixed effects, year fixed effects, and all control variables are included in all regressions. The dependent variable is employment protection in all regressions. These first stage results vary slightly depending on the sample size of the affiliate sales measure used in the second stage.

TABLE 5  
Foreign Affiliate Sales by Destination (IV)

Lagged Independent Variables	Total Sales	Local Sales	Foreign Sales	U.S. Sales
Employment Protection	-0.654*** [0.140]	-0.413*** [0.136]	-1.511*** [0.492]	-2.988*** [1.155]
GDP	1.864*** [0.143]	2.045*** [0.155]	0.831*** [0.307]	2.123*** [0.483]
Population	0.314 [0.461]	0.153 [0.483]	3.007** [1.266]	1.978 [2.596]
Trade Costs	-0.831*** [0.120]	-0.449*** [0.126]	-2.406*** [0.311]	-2.697*** [0.574]
Skill	-1.153*** [0.156]	-0.698*** [0.123]	-2.680*** [0.496]	-3.889*** [1.069]
Tax Rate	0.005 [0.059]	-0.012 [0.053]	0.19 [0.155]	-0.094 [0.266]
Investment Costs	-0.384** [0.165]	-0.405** [0.162]	-1.503*** [0.552]	-2.773*** [1.003]
Observations	482	464	474	456
R-squared	0.99	0.99	0.95	0.91
Cragg-Donald F Stat, Instruments	44	43	43	42
Hansen J p-value	0.63	0.31	0.59	0.42

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country and year fixed effects are included in all regressions. The dependent variable is U.S. foreign affiliates sales. Total Sales are affiliate sales to all locations, Local Sales are affiliate sales within the host country, Foreign Sales are affiliate sales to other foreign countries not including the U.S. or the host country, and U.S. sales are affiliate sales back to the U.S.

TABLE 6  
Host Employment Protection, Unweighted Average of Competitor's EP

Lagged Independent Variables	OLS	GMM	IV
Competitor's EP	-0.887 [0.938]	-0.831 [0.754]	-6.276 [4.803]
Host EP	0.792*** [0.070]	0.792*** [0.034]	0.597*** [0.192]
Observations	494	468	494
R-squared	0.99		0.99
Cragg-Donald F Stat, Instruments			7
Hansen J p-value		1	0.02
AR2 p-value		0.053	

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country fixed effects, year fixed effects, and all control variables (including unions and ideology) are included in all regressions. The dependent variable is employment protection in the host country. The competitor's employment protection variable is the unweighted average of employment protection in other foreign countries.

TABLE 7  
Host Employment Protection, Distance Weighted Average of Competitor's EP

Lagged Independent Variables	OLS	GMM	IV
Competitor's EP	-0.002 [0.100]	-0.01 [0.139]	-0.191 [0.374]
Host EP	0.825*** [0.051]	0.821*** [0.030]	0.818*** [0.052]
Observations	494	468	494
R-squared	0.99		0.99
Cragg-Donald F Stat, Instruments			19
Hansen J p-value		1	0.64
AR2 p-value		0.054	

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country fixed effects, year fixed effects, and all control variables (including unions and ideology) are included in all regressions. The dependent variable is employment protection in the host country. The competitor's employment protection variable is the weighted average of employment protection in other foreign countries using the inverse of distance between the host and foreign country as weights.

TABLE 8  
Host Employment Protection, Sales Weighted Average of Competitor's EP

Lagged Independent Variables	OLS	GMM	IV
Competitor's EP	-0.688 [0.556]	-0.676 [0.416]	-2.708** [1.326]
Host EP	0.796*** [0.066]	0.794*** [0.027]	0.712*** [0.085]
Observations	494	468	494
R-squared	0.99		0.99
Cragg-Donald F Stat, Instruments			17
Hansen J p-value		1	0.31
AR2 p-value		0.059	

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country fixed effects, year fixed effects, and all control variables (including unions and ideology) are included in all regressions. The dependent variable is employment protection in the host country. The competitor's employment protection variable is the weighted average of employment protection in other foreign countries using affiliate sales to the U.S. and to other foreign countries as weights.

TABLE 9  
Foreign Affiliate Sales to the U.S. by Type (IV)

Lagged Independent Variables	Total U.S. Sales	U.S. Sales to:		U.S. Sales of:	
		Parent	Unaffiliate	Goods	Services
Employment Protection	-2.988*** [1.155]	-3.020*** [1.125]	-2.568** [1.041]	-3.638** [1.468]	-0.127 [1.463]
GDP	2.123*** [0.483]	1.690*** [0.546]	2.731*** [0.776]	1.759*** [0.590]	7.634*** [0.973]
Population	1.978 [2.596]	3.778 [2.620]	-5.077* [2.620]	3.730 [2.929]	-13.883*** [3.889]
Trade Costs	-2.697*** [0.574]	-2.475*** [0.595]	-3.299*** [0.642]	-2.935*** [0.725]	-1.770** [0.809]
Skill	-3.889*** [1.069]	-4.361*** [1.046]	-2.488*** [0.951]	-4.431*** [1.502]	-4.217*** [1.215]
Tax Rate	-0.094 [0.266]	-0.214 [0.283]	0.199 [0.395]	-0.224 [0.333]	-0.003 [0.443]
Investment Costs	-2.773*** [1.003]	-2.997*** [1.058]	-0.621 [1.075]	-3.325*** [1.239]	2.662** [1.254]
Observations	456	455	456	399	411
R-squared	0.91	0.91	0.86	0.91	0.89
Cragg-Donald F Stat	42	42	42	30	33
Hansen J p-value	0.42	0.48	0.36	0.46	0.83

Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All variables are in natural logs. The independent variables are all lagged one period. Country and year fixed effects are included in all regressions. The dependent variable is foreign affiliate sales back to the U.S. These are decomposed into sales to U.S. parents and sales to unaffiliated U.S. parties. U.S. sales are also broken down into sales of goods and sales of services.

TABLE 10  
Impact of Different Types of Employment Protection on Foreign Affiliate Sales to the U.S. (IV)

Lagged Independent Variables	U.S. Sales		
EP Total	-2.988*** [1.155]		
EP Firing		-4.285*** [1.480]	
EP Hiring			-2.331** [1.100]
GDP	2.123*** [0.483]	0.837 [0.534]	3.776*** [1.271]
Population	1.978 [2.596]	-0.507 [1.748]	2.112 [3.196]
Trade Costs	-2.697*** [0.574]	-1.260*** [0.434]	-2.791*** [0.706]
Skill	-3.889*** [1.069]	-3.840*** [1.000]	-3.850*** [1.213]
Tax Rate	-0.094 [0.266]	-0.899*** [0.245]	0.004 [0.374]
Investment Costs	-2.773*** [1.003]	-0.77 [0.972]	-3.675*** [1.350]
Observations	456	456	456
R-squared	0.91	0.92	0.88
Cragg-Donald F Stat	42	58	11
Hansen J p-value	0.42	0.82	0.11

Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are in natural logs. The independent variables are all lagged one period. Country and year fixed effects are included in all regressions. The dependent variable is foreign affiliate sales back to the U.S. Different regressions include different measures of employment protection. Total employment protection is an average of "firing" which includes restrictions on individual dismissals and "hiring" which includes restrictions on the hiring of temporary workers.

TABLE 11  
Host Employment Protection, Contemporaneous Average of Competitor's EP (ML Estimation)

Lagged Independent Variables	Unweighted	Distance	Sales
Competitor's EP	-3.572*** [0.421]	-0.174*** [0.056]	-0.922*** [0.160]
Host EP	0.704*** [0.053]	0.820*** [0.048]	0.791*** [0.049]
Observations	494	494	494

Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All variables are in natural logs. All independent variables, except Competitor's EP, are lagged one period. Country fixed effects, year fixed effects, and all control variables (including unions and ideology) are included in all regressions. The dependent variable is employment protection in the host country. The competitor's employment protection variable is the average of employment protection in other foreign countries, which is calculated as an unweighted average, a weighted average using distance, and a weighted average using affiliate sales.

## 7

## ASSESSING THE GAINS FROM STRUCTURAL REFORMS FOR JOBS AND GROWTH

*Derek Anderson, Bergljot Barkbu, Lusine Lusinyan, and Dirk Muir*

### Structural Reforms and Gaps in Euro Area Countries

Euro area countries, particularly those in the periphery, have made strong progress on their structural reform agendas since the global financial crisis. The crisis created the impetus to implement difficult, but needed, structural reforms. In particular, important labor market reforms aimed at reducing labor adjustment costs and promoting employment have been put in place in Greece, Italy, Portugal, and Spain, while countries in the core have primarily focused on increasing labor force participation, for example, through pension reform. Product market reforms have pursued market liberalization and deregulation, mainly in the periphery, although the overall progress on implementing the European Union (EU) Services Directive has been slow in both the periphery and the core.

Progress has been impressive, but important structural gaps still exist, with specific priorities varying across countries.<sup>1</sup> Indicators of product market regulation and the degree of competition in various sectors of the economy suggest scope for easing regulation and strengthening competition in the euro area vis-à-vis the Organization for Economic Cooperation and Development (OECD) frontier cases. Although some euro area countries (notably, Ireland) are among the OECD best-practice cases, product markets are, on average, more heavily regulated and less open to competition in the euro area than in other advanced economies (Figure 7.1, left panel), reflected also in higher price markups, which is a proxy measure for the degree of competition, especially in services (Figure 7.1, right panel).

There is also significant scope for making European labor markets more inclusive, dynamic, and efficient, while recognizing that there is no single optimal labor market model. Employment protection is more stringent in the euro area than elsewhere in advanced OECD countries (Figure 7.2, left panel), which can have a negative impact on labor productivity (Bassanini, Nunziata, and Venn, 2009). Unemployment insurance is relatively more generous while retirement incentives encourage early exit from the labor force. In addition to labor adjustment costs, the tax wedge is high in most euro area countries, and reducing it by shifting taxation from direct to indirect taxes

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Research assistance was provided by Pedro Espallat. The chapter builds on Barkbu and others (2012) and Lusinyan and Muir (2013).

<sup>1</sup> IMF (2013a) discusses the key priorities for euro area countries, based on in-depth country-specific analyses carried out by IMF country teams as part of economic surveillance or program work.

Figure 7.1 Selected Indicators of Product Market Regulation and Competition

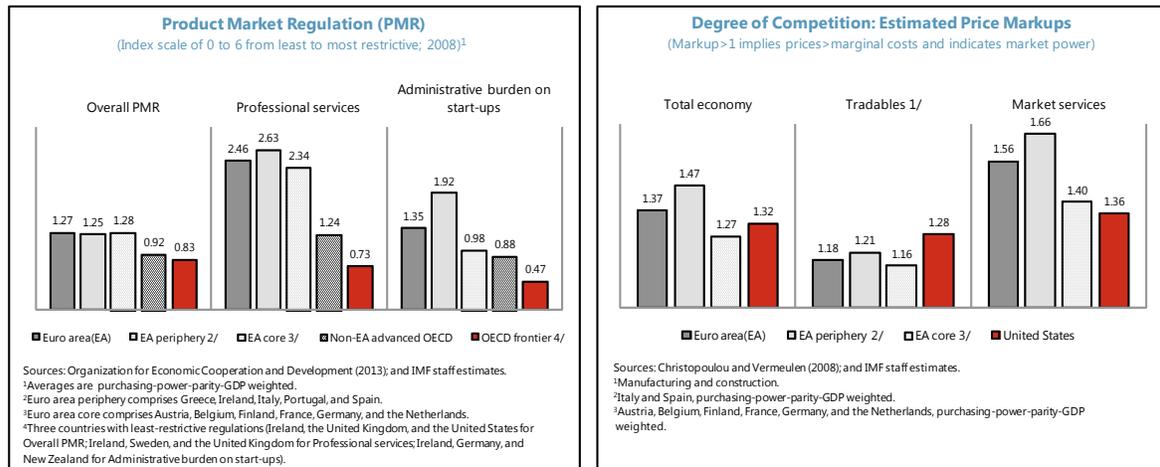
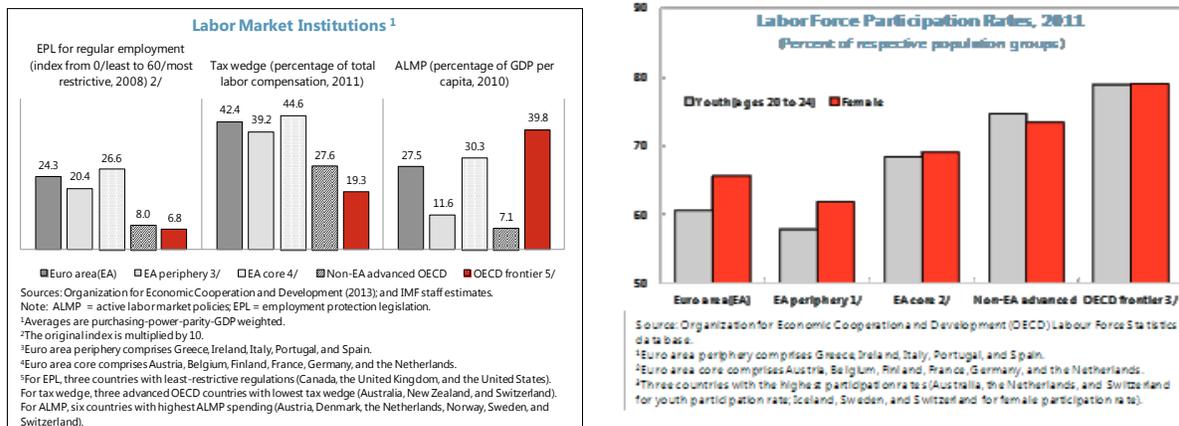


Figure 7.2 Selected Indicators of Labor Market Institutions and Performance



could further boost employment, growth, and competitiveness. The use and scale of active labor market policies vary across the euro area. Strengthening such policies, together with other measures to boost labor force participation (e.g., child care support), can have an important impact on employment, employability, and efficiency of job matching, which would help address the problems of low labor utilization, especially female and youth, that many euro area countries are facing (Figure 7.2, right panel).

## Quantifying the Impact of Structural Reforms

This chapter analyzes the potential macroeconomic impact of structural reforms that would help narrow the structural gaps in the euro area. For each of the euro area countries, the simulation models the impact of closing roughly 50 percent of the gap with OECD frontier cases in labor and product market policies as well as improving the functioning of the pension and tax systems. Product market reforms seek to reduce anticompetitive regulations, lower barriers to entry, and

increase competition. Labor market reforms are more varied, and include reducing employment protection legislation, reducing unemployment benefits, increasing child care support, implementing active labor market programs, and enacting pension-related reforms such as increasing the standard retirement age and increasing the incentive to work between the ages of 60 and 65. Finally, revenue-neutral tax reforms shift taxation from labor and corporate income to consumption. OECD empirical estimates of the dynamic effects of structural reforms on macroeconomic variables such as labor participation, unemployment, and productivity are used as inputs to the model to generate the estimates of the impact of reforms on real GDP.<sup>2</sup>

To quantify the impact, the IMF's Global Integrated Monetary and Fiscal model, a general equilibrium model that features nominal and real adjustment costs and incomplete asset markets, is used.<sup>3</sup> The model brings together economic agents that optimize freely (firms maximize profits, and households maximize utility based on a consumption-leisure choice) and liquidity-constrained agents that consume their income fully. The analysis in this chapter uses a six-region version, composed of the core euro area countries, the euro area periphery countries, the United States, emerging Asia, Japan, and the rest of the world.<sup>4</sup>

Several key features drive the short-term dynamics of the reform impact. The euro area core and periphery regions follow a common inflation targeting regime. Fiscal policy is independently determined in each region and is based on a policy rule that ensures long-term sustainability<sup>5</sup> while allowing for short-term countercyclical stabilization policies. The gradual implementation of reforms, combined with the gradual adjustment of labor supply and capital in response, drives the difference between short- and long-term effects. The simulations are conducted with monetary policy that accommodates the increase in inflation in the short term, complementing the positive effects on real GDP.

Households and firms are assumed not to believe initially that the government will successfully enact its reform agenda, which affects their behavior. Households and firms base their current decisions and expectations only on the reforms actually implemented up to that point. However, the government continues to implement its reforms each year, so households and firms continually update their decisions, gradually adjusting their expectations. After five years, households and firms are assumed to believe fully that the entire announced reform package will be implemented. This process of gradual acceptance affects the outcome in the short to medium term, but the long-term outcome will be the same as if households and firms immediately

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<sup>2</sup> For a detailed discussion of the methodology used to obtain the empirical estimates of the impact of structural reforms, see, for example, Bouis and Duval (2011); updated estimates have been used in the simulations in this chapter.

<sup>3</sup> Kumhof and others (2010) and Anderson and others (2013) provide details on the theoretical foundations and properties of the Global Integrated Monetary and Fiscal model.

<sup>4</sup> In what follows, the euro area periphery comprises Greece, Ireland, Italy, Portugal, and Spain; the remainder of the euro area countries make up the core euro area.

<sup>5</sup> By doing so, this analysis abstracts from considerations of the way different sovereign debt levels may impact fiscal policy and its effects.

believe in the full implementation of the announced reform package (see the section titled Reform Implementation: Macroeconomic and Policy Environment).

The analysis has some limitations. In particular, employment is represented only as total hours worked, but it cannot be further decomposed into the unemployment rate, the participation rate, or average hours worked. The way the equilibrium wage is set does not allow involuntary unemployment to be captured. In addition, the analysis is conducted around an initial steady state that does not account for different cyclical or competitiveness positions across countries, which could affect the extent of possible reforms or their full effects. The estimates are therefore only illustrative examples of what might be achieved in the short and long terms. The section titled Reform Implementation: Macroeconomic and Policy Environment looks at how reform implementation and its impacts may be affected by policy credibility, price stickiness, and demand conditions.

### **The Benchmark Scenario**

Structural reforms can raise real GDP markedly, though the full effects of reforms only materialize with time. This section uses estimates of the distance from the OECD frontier cases to consider the scope and potential gains from reforms and constructs a benchmark scenario (see Table 7.1), using as a baseline the IMF's country-specific projections, as reflected in the April 2013 *World Economic Outlook*. The dynamic effects of different reforms on real GDP, employment, and competitiveness for the periphery and core euro area countries are discussed.

### **Product market reforms**

Euro area countries tend to have higher markups than other advanced economies, indicating substantial scope for gains from reforms. Reforms are assumed to close roughly half the gap between the countries' current regulatory burden and a frontier measure (defined differently for different reforms) within 13 years, but the reforms are front-loaded into the first 5 years (Table 7.1). The empirical estimates of the impact on productivity from reducing regulatory barriers are based on Boursès and others (2010), and take into account the short-term dynamics of reforms in Bouis and others (2012), as well as the estimates for markups from other sources, such as Forni, Gereli, and Pisani (2010). The regulatory burden indicators are estimated using the OECD's survey-based product market regulation index (Boylaud and Nicoletti, 2003). In the tradables sector, the indicators cover product market regulations, such as state control of business enterprises, legal and administrative barriers to entrepreneurship, and barriers to international trade and investment. The nontradables sector consists of retail trade, network industries, and professional services. The indicators for retail trade are barriers to entry, operational restrictions, and price controls; for professional services, they are barriers to entry and conduct regulation in the legal, accounting, engineering, and architectural professions; and for network industries they are barriers to entry and public ownership in the energy, transport, and communications sectors.

Increasing competition in the tradables and nontradables sectors in the euro area could raise the level of real GDP by 1¾ percent after five years and by more than 7 percent in the long term. The first-year impact on real GDP would, however, be limited to ¼ percent (Figure 7.3). Greater

Table 7.1. Assumptions for Structural Reforms

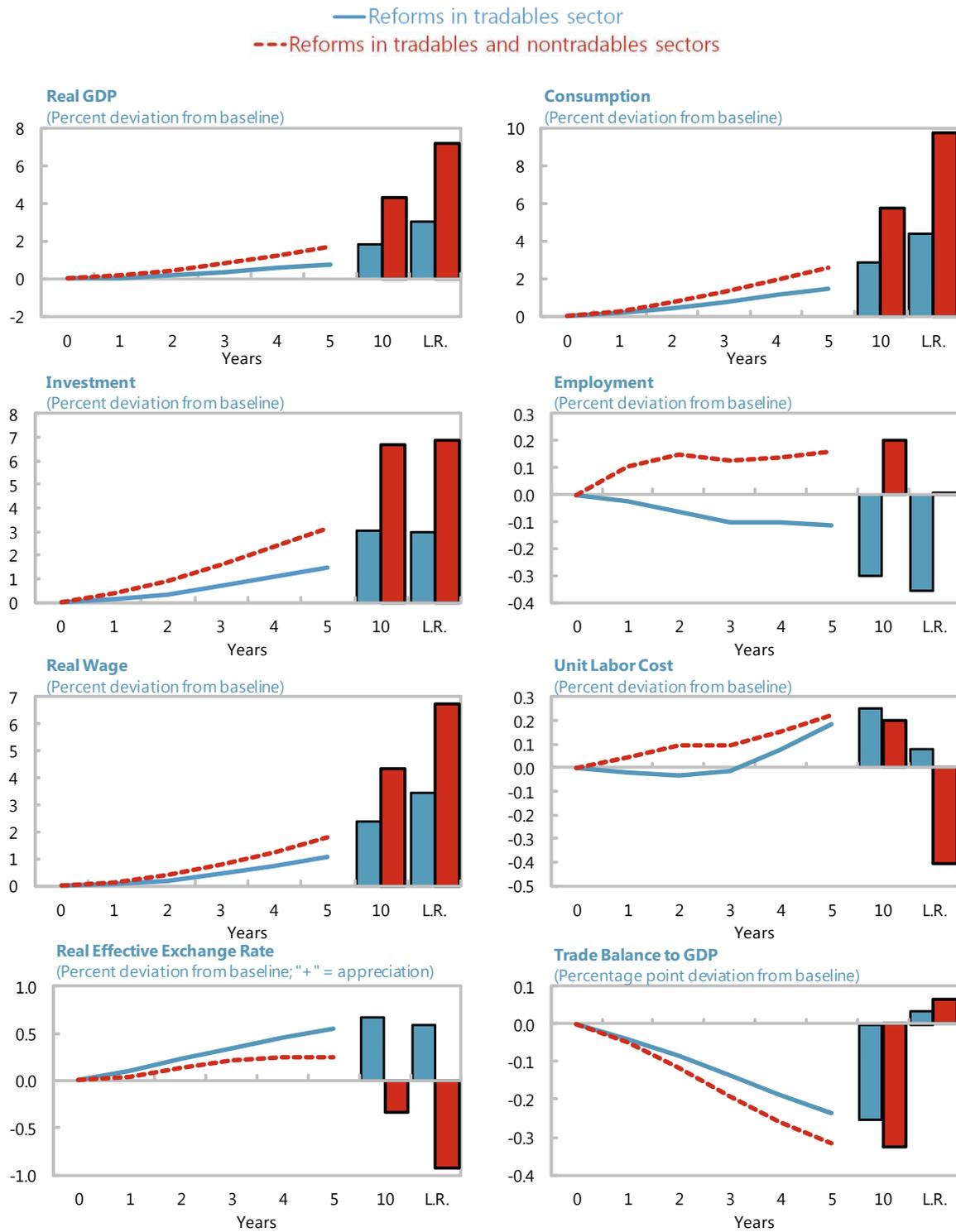
Reform	Proxy	Phasing	Other Assumptions (percent, except as noted)	
			Core	Periphery
<b>Product Market Reforms</b>				
Increasing competition in the tradables sector	Decrease in the markup on tradable goods	Reform measures increase productivity for 13 years. Not fully credible until the 6th year.	<b>Tradables Markup Decrease</b> 4.9	<b>Decrease</b> 6.7
Increasing competition in the nontradables sector	Decrease in the markup on nontradable goods, decrease in the wage markup	Reform measures increase productivity for 13 years. Not fully credible until the 6th year.	<b>Nontradables Markup Decrease</b> 14.8	<b>Decrease</b> 21.0
			<b>Wage Markup Decrease</b> 22.5	<b>Decrease</b> 40.4
<b>Labor Market Reforms</b>				
Easing employment protection	Increase in economy-wide labor-augmenting productivity	Reform measures increase productivity for 13 years. Not fully credible until the 6th year.	<b>Productivity Increase</b> 0.8	<b>Increase</b> 0.6
Strengthening active labor market policies	Increase in labor supply, increase in government consumption	Increased fiscal spending phased in over 2 years. Increase in labor supply over 13 years. Not fully credible until the 6th year.	<b>Labor Supply Increase</b> 0.1	<b>Increase</b> 0.2
			<b>Fiscal Spending Increase</b> 0.2% of GDP	<b>Increase</b> 0.2% of GDP
Increasing female participation through child care	Increase in labor supply, increase in government consumption	Increased fiscal spending phased in over 2 years. Increase in labor supply over 13 years. Not fully credible until the 6th year.	<b>Labor Supply Increase</b> 0.4	<b>Increase</b> 0.5
			<b>Fiscal Spending Increase</b> 0.2% of GDP	<b>Increase</b> 0.2% of GDP
Reducing unemployment benefits through the average replacement rate	Increase in labor supply, decrease in transfers to LIQ households	Decrease in transfers phased in over 2 years. Increase in labor supply over 13 years. Not fully credible until the 6th year.	<b>Labor Supply Increase</b> 0.4	<b>Increase</b> 0.6
			<b>Transfers Decrease</b> 0.2% of GDP	<b>Decrease</b> 0.6% of GDP
Reducing pension benefits	Increase in labor supply, decrease in transfers to LIQ households	Decrease in transfers phased in over 6 years. Increase in labor supply over 13 years. Not fully credible until the 6th year.	<b>Labor Supply Increase</b> 0.3	<b>Increase</b> 0.2
			<b>Transfers Decrease</b> 0.9% of GDP	<b>Decrease</b> 0.6% of GDP
<b>Tax Reforms</b>				
Revenue-neutral tax switching	Increase in the value-added tax offset by cuts to labor and corporate income taxes over two years	Phased in over two years. Immediately credible.	<b>VAT Revenue/GDP Increase (percentage points)</b> 1.75	<b>Increase</b> 1.25
			<b>Labor Tax Revenue/GDP Decrease (percentage points)</b> 1.0	<b>Decrease</b> 0.75
			<b>Capital Tax Revenue/GDP Decrease (percentage points)</b> 0.75	<b>Decrease</b> 0.5

Sources: Organization for Economic Cooperation and Development and IMF staff estimates

Note: LIQ = liquidity-constrained.

## ASSESSING THE GAINS FROM STRUCTURAL REFORMS FOR JOBS AND GROWTH

Figure 7.3 Product Market Reforms



Sources: Global Integrated Monetary and Fiscal Model simulations using OECD and IMF staff estimates

Note: L.R. is the long run (2060).

competition would reduce the cost of goods and services to consumers, leading to an increase in consumption, investment, and exports. The increased demand for goods would increase firms' demand for factors of production, putting upward pressure on real wages. Employment would be lower because the stronger income effect outweighs the substitution effect, driven mostly by reforms in the tradables sector.

The euro area's competitiveness would slightly improve in the long term. With labor productivity almost 7 percent higher, unit labor cost would decline. In the long term, the euro would depreciate in real terms by almost 1 percent and the nominal trade balance would slightly improve after an initial deterioration driven by strong imports.

Gains from product market reforms are more extensive in the periphery than in the core. Almost half of the gains from product market reforms originate in the periphery, despite it representing only one-third of the economic size of the euro area (Table 7.2).

### ***Labor market reforms***

The benchmark scenario for labor market reforms comprises policies that increase labor supply and ease adjustment. Labor market institutions are a key reform priority, but involve many factors that need to be taken into account when charting a course for reforms and that may vary in importance across countries (Blanchard, Jaumotte, and Loungani, 2013). To model the impact of labor market reforms, estimates are used from Bassanini and Duval (2006), taking into account the short-term dynamics as found in Bouis and others (2012) for reforms to ALMP, unemployment, and EPL, and from Jaumotte (2003).

Active labor market policies (ALMP) aim to encourage the nonemployed to retrain and return to the labor market. The analysis assumes that countries increase the ratio of ALMP spending per unemployed to GDP per capita relative to the average within a set of countries with high ALMP spending (Denmark, Austria, the Netherlands, Norway, Sweden, and Switzerland). This assumption is implemented through a permanent increase in government spending for two years, financed through an increase in public debt and an increase in labor supply.

Unemployment insurance helps workers insure against unemployment, but may also lead to lower employment and longer unemployment duration. The impact of a reduction in the average replacement rate (ARR) of unemployment insurance benefits relative to the average within a set of countries with low replacement rates (Australia, Canada, Japan, New Zealand, the United Kingdom, and the United States) is considered. This impact is implemented in the model through a reduction in government spending and an increase in labor supply.

- *Employment protection legislation (EPL)* encourages stable employment relationships, but may also hamper the reallocation process, with a negative impact on productivity (e.g., Martin and Scarpetta, 2012). Countries are assumed to ease employment protection relative to the average of the three lowest levels observed across OECD economies. The impact of this easing is implemented using the OECD estimates of increased labor productivity in both the tradables and nontradables sectors.

**Table 7.2. Simultaneous Reform Packages, Decomposition of Real GDP***(Percent deviation from baseline)*

	Year 1	Year 2	Year 5	Long Run
<b>Euro Area Periphery</b>				
Benchmark scenario	1.4	2.7	4.8	15.4
Product and labor reforms	0.9	1.8	4.2	14.5
Product market reforms	0.3	0.6	2.4	10.0
Tradables sector	0.1	0.3	1.1	3.8
Nontradables sector	0.2	0.4	1.3	6.2
Labor market reforms	0.6	1.1	1.6	3.5
Employment protection	0.0	0.1	0.2	0.5
Active labor market policy	0.2	0.3	0.1	0.2
Female participation rate	0.4	0.7	0.2	0.7
Unemployment insurance	0.0	-0.1	0.5	0.9
Pensions	0.1	0.2	0.3	0.7
Tax reforms	0.4	0.6	0.6	1.0
<b>Euro Area Core</b>				
Benchmark scenario	1.1	2.1	3.7	10.6
Product and labor reforms	0.7	1.3	2.8	9.2
Product market reforms	0.1	0.3	1.3	5.7
Tradables sector	0.0	0.1	0.6	2.6
Nontradables sector	0.1	0.3	0.8	3.1
Labor market reforms	0.5	0.9	1.2	2.8
Employment protection	0.0	0.1	0.2	0.7
Active labor market policy	0.1	0.2	0.1	0.2
Female participation rate	0.2	0.3	0.2	0.5
Unemployment insurance	0.1	0.2	0.1	0.4
Pensions	0.1	0.1	0.4	0.6
Tax reforms	0.4	0.7	0.8	1.4
<b>Euro Area</b>				
Benchmark scenario	1.2	2.3	4.1	12.3
Product and labor reforms	0.7	1.5	3.3	11.0
Product market reforms	0.2	0.5	1.7	7.2
Tradables sector	0.1	0.2	0.8	3.0
Nontradables sector	0.1	0.3	1.0	4.2
Labor market reforms	0.5	0.9	1.4	3.0
Employment protection	0.0	0.1	0.2	0.6
Active labor market policy	0.1	0.2	0.1	0.2
Female participation rate	0.3	0.4	0.2	0.5
Unemployment insurance	0.1	0.1	0.3	0.6
Pensions	0.1	0.2	0.3	0.7
Tax reforms	0.4	0.7	0.8	1.2

Sources: Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates.

- *Increased availability of public child care services* can increase labor supply, especially of women, by reducing the opportunity cost of employment. The analysis assumes that countries increase the ratio of public child care spending to GDP per capita relative to the average of countries with the highest public child care spending (Denmark, Norway, Sweden, and the United Kingdom). This increase in child care spending is modeled through a permanent increase in government spending for two years and an increase in labor supply.

Labor market reforms also cover pension reform. Pension reform would consist of both an increase in the retirement age by two years and a move to actuarial neutrality (a zero implicit tax rate on continued employment for workers between the ages of 60 and 65). This reform would lead to permanently lower pension outlays (represented by a reduction in transfers to liquidity-constrained households), allowing for a permanent reduction in government debt, and to an increase in labor supply.

The labor market reforms could have a positive but modest impact on real GDP of 1½ percent after five years and 3 percent in the long term. The short-term gain would be limited to ½ percent of GDP, but still double the impact of product market reforms (Figure 7.4). In the short term, households would perceive the changes in policies regarding ALMP, ARR, and child care as temporary, and would not fully commit to supplying more labor. Similarly, because productivity gains from EPL would not be fully realized in the short term, its impact would be marginal. Wages would fall in the medium term because the positive effects of higher demand for euro area goods, and hence for the factors of production, would still take time to materialize, but would still increase in the long term. The effects would also be apparent in the dynamics of consumption, which would decline notably after five years before increasing in the long term. In the long term, most of the increase would be driven by the reforms that boost labor supply. However, the productivity impact from EPL would be substantial, accounting for more than a quarter of the impact on real GDP.

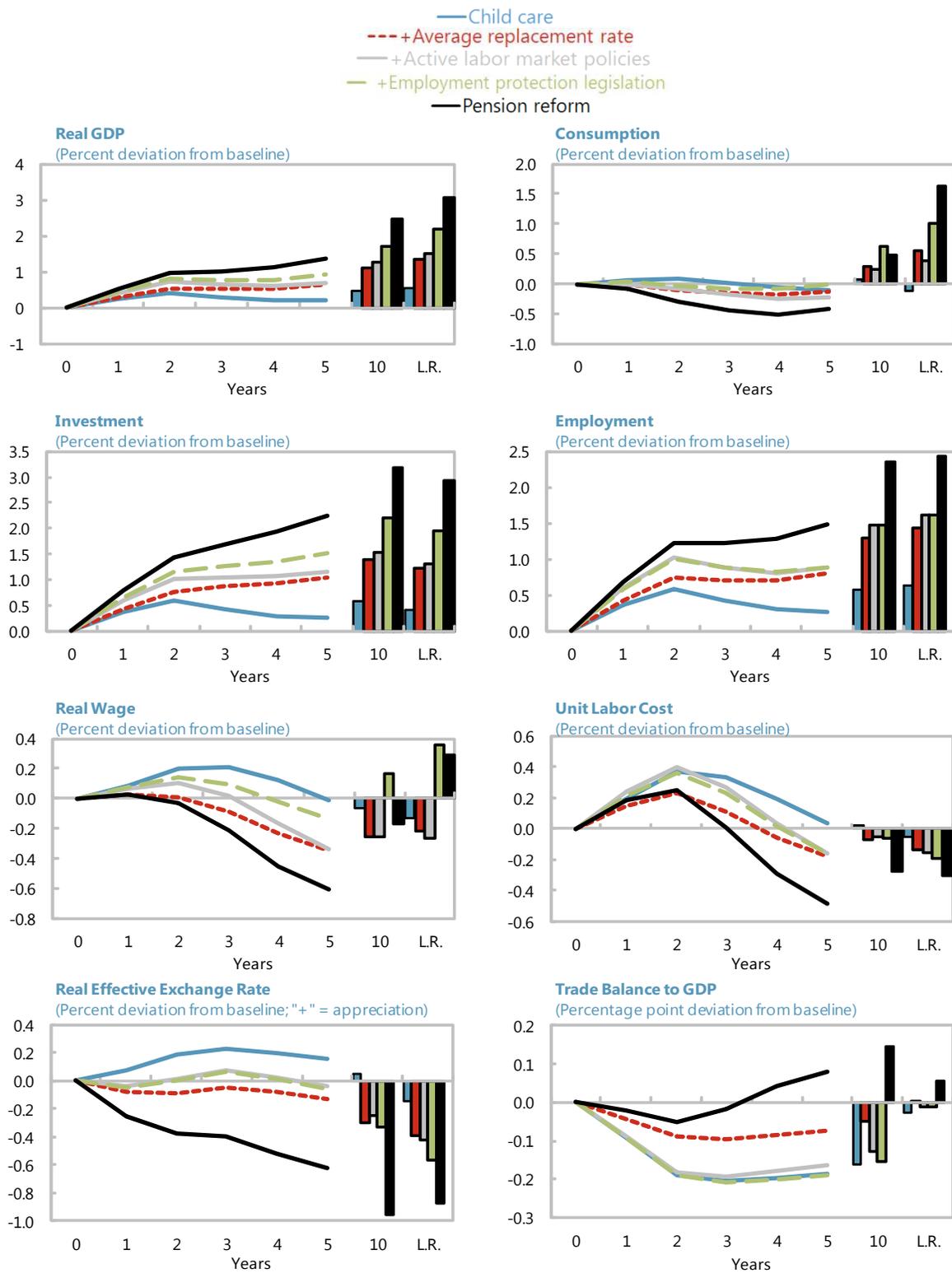
Euro area competitiveness and labor productivity would improve in the long term. Although there would be downward pressure on productivity from the increase in labor supply, it would be offset by the EPL reforms. Therefore, the unit labor cost is lower, reinforced by the decline in real wages resulting from higher labor supply. With more labor available for production, firms' demand for capital would also increase, and investment would be permanently higher. Cheaper goods being produced in the euro area would also lead to a permanent real exchange rate depreciation of almost 1 percent and a slightly stronger external position.

Labor market reforms would have a stronger short-term impact than product market reforms, but their effect would become relatively muted. According to OECD estimates, the euro area is not too distant from best practices in ALMPs and child care services. The effects of these reforms on productivity and GDP are empirically found to be relatively small (Barnes and others, 2011; Bouis and Duval, 2011).

However, the fiscal implications of labor reforms would be positive for the euro area. In the long term, the decrease in spending on pensions and unemployment insurance would lead to a fall in the level of government debt in the euro area as a whole of almost 20 percent of GDP (with the

ASSESSING THE GAINS FROM STRUCTURAL REFORMS FOR JOBS AND GROWTH

**Figure 7.4 Labor Market Reforms**



Sources: Global Integrated Monetary and Fiscal Model simulations using OECD and IMF staff estimates  
 Note: L.R. is the long run (2060).

largest reduction in debt occurring in the periphery countries). Because there would be less demand for global saving to maintain the level of euro area debt, the global interest rate would decline permanently, by about 10 basis points.

Labor market reforms would have a larger impact in the periphery than in the core. The long-term gains in real GDP would be  $3\frac{1}{2}$  percent in the periphery and  $2\frac{3}{4}$  percent in the core (Table 7.2). The periphery could gain most from reforms to unemployment insurance, female labor market participation, and pensions; for the core, the gains would be largest from reforms to EPL and pensions.

### **Revenue-neutral tax reforms**

Revenue-neutral tax reform shifts the tax burden away from distortionary direct taxes to indirect taxes, increasing the incentives to work and invest. In particular, “fiscal devaluation,” which is a budget-neutral shift from employers’ social contributions toward value-added taxes (VAT), has been shown in the empirical literature to increase output and employment (see, for example, IMF, 2012). Because labor-related tax revenues constitute a large share of the revenues in the euro area, transferring this burden to VAT would increase the incentive to work and to hire labor, leading to an increase in labor supply and real GDP (Allard and others, 2010). Similarly, a shift away from corporate income taxes to VAT would increase the return on capital, leading to higher investment and real GDP. Tax revenues can be increased by broadening the tax base as well as by increasing tax rates. The table below shows the size of the revenue-neutral tax reform that is assumed to be implemented in the core and the periphery of the euro area over two years, starting in 2013.

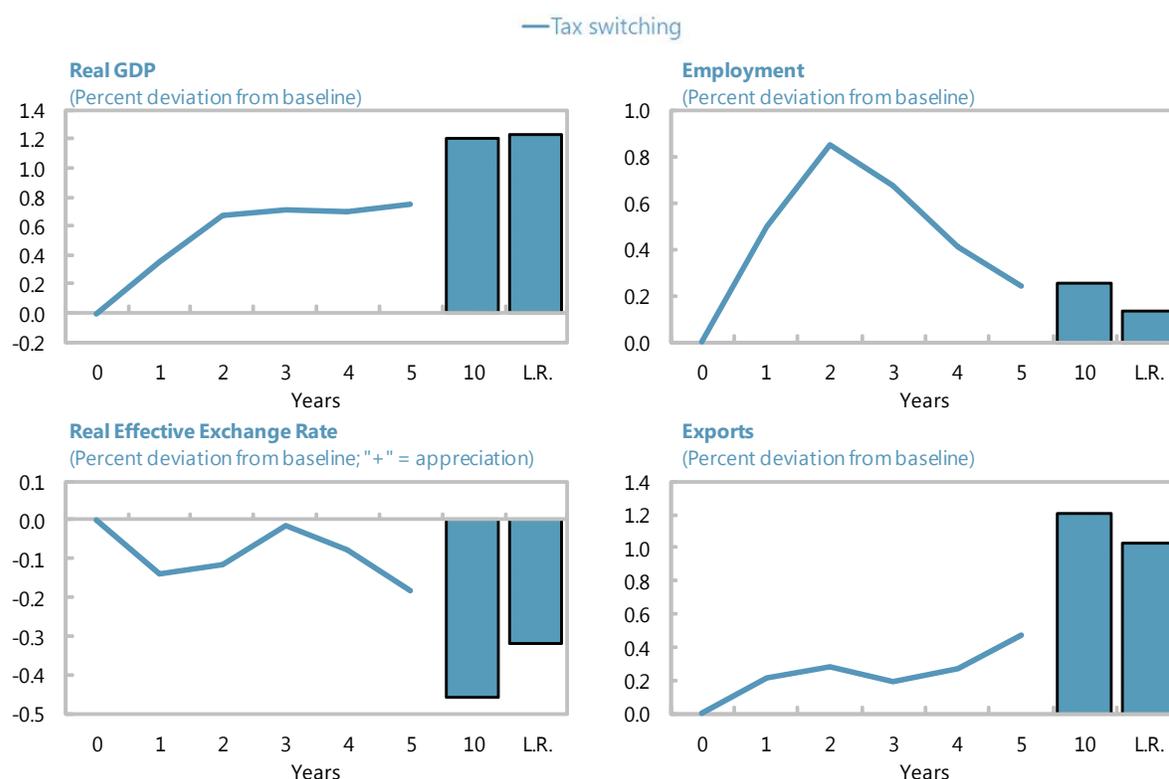
#### **Assumed Two-Year Change in Tax Instruments as a Share of GDP**

	Corporate Tax	Labor Tax	Value-Added Tax
Core	-0.75	-1.0	1.75
Periphery	-0.5	-0.75	1.25

A shift in taxation from direct to indirect taxes could raise real GDP by  $\frac{3}{4}$  percent after five years and  $1\frac{1}{4}$  percent in the long term. In the first year, GDP would be higher by almost  $\frac{1}{2}$  percent (Figure 7.5). The medium-term impact would be dampened because households and firms believe that the reforms are temporary. Therefore, although consumption tax increases would immediately affect consumers’ marginal propensity to consume, the direct tax cuts would not have as large an offsetting effect on household and firm behavior. Consumption would fall after five years, although it would increase in the long term. Employment, after a positive short-term reaction, would be only marginally higher in the long term (although the real wage would increase). Because the tax cuts would affect the cost of capital and labor directly, competitiveness would improve. The unit labor cost would fall slightly despite increasing real wages, exports would rise by about 1 percent in the long term, and the real exchange rate would depreciate.

An increase in consumption taxes would lower household consumption, but the positive effects from removing tax distortions would be much greater. In the long term, the labor income tax cut

Figure 7.5 Fiscal Reforms



Sources: Global Integrated Monetary and Fiscal Model simulations using OECD and IMF staff estimates

Note: L.R. is the long run (2060).

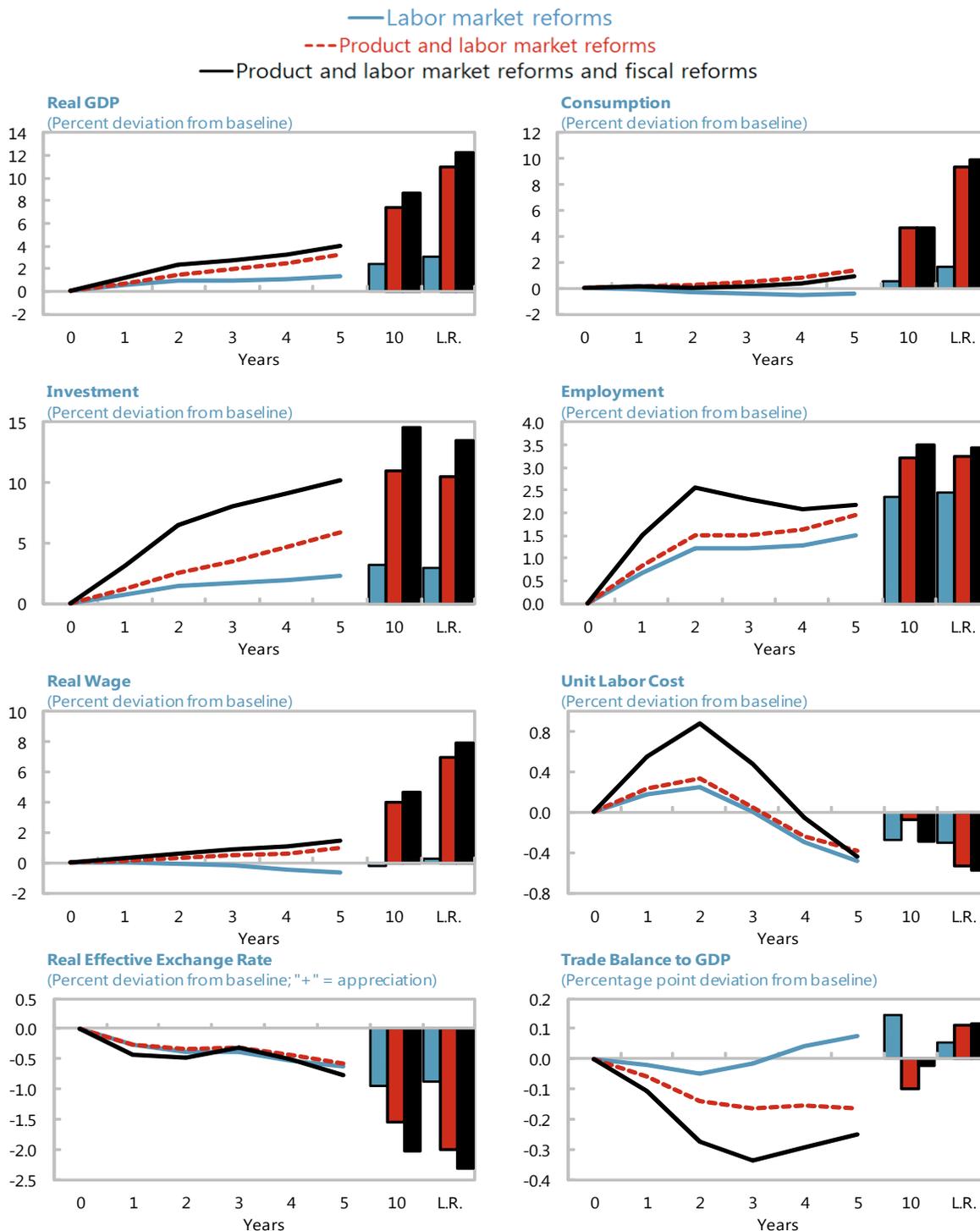
would offset the negative effects from consumption taxes on households' spending power and would provide an incentive for more labor supply. The corporate income tax cut would reduce the cost of capital faced by firms, encouraging greater demand for capital and labor. The assumption that firms only gradually believe in the implementation of the reforms would slow this process.

### **Combining all structural reforms**

Simultaneous implementation of product market, labor market, and tax reforms would be larger than the sum of the components. The impact on real GDP would be 4 percent after five years and 12 percent in the long term (Figure 7.6).<sup>6</sup> Product market reforms would strongly boost consumption even as labor market and tax reforms act as a drag, especially in the short term. Employment would increase in both the medium and long terms, a reflection of the impact of labor market and tax reforms. Real wages would still be higher, despite downward pressure from

<sup>6</sup> These results differ from those reported in IMF (2013a, 2013b) because these simulations include fiscal reforms, assume a larger gap to close through product market reforms, and use more updated data and a different model.

**Figure 7.6 Benchmark Scenario**



Sources: Global Integrated Monetary and Fiscal Model simulations using OECD and IMF staff estimates  
 Note: L.R. is the long run (2060).

**Table 7.3. Individual versus Simultaneous Reform Packages, Decomposition of Real GDP***(Percent deviation from baseline)*

	Year 1	Year 2	Year 5	Long Run
<b>Reforms Implemented Individually by Euro Area Core and Euro Area Periphery</b>				
All reforms	1.0	2.1	4.0	12.1
Product and labor reforms	0.6	1.3	3.3	10.9
Product market reforms	0.2	0.5	1.7	7.2
Labor market reforms	0.1	0.3	0.8	2.2
Tax reforms	0.4	0.7	0.8	1.2
<b>Reforms Implemented Simultaneously by Euro Area Core and Euro Area Periphery</b>				
All reforms	1.2	2.3	4.1	12.3
Product and labor reforms	0.7	1.5	3.3	11.0
Product market reforms	0.2	0.5	1.7	7.2
Labor market reforms	0.5	0.9	1.4	3.0
Tax reforms	0.4	0.7	0.8	1.2

Sources: Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates.

the labor market reforms. The unit labor cost would decline, and a strong labor productivity increase, driven by product market reforms, would dominate.

### **Reform Coordination, Spillovers, and Intra–Euro Area Rebalancing**

Synergies would come into play from the simultaneous implementation of reforms in the core and the periphery. Implementing the benchmark reform scenario simultaneously in both regions would provide slightly larger gains than the added effect from reform packages implemented in each region in isolation (Table 7.3). Spillovers would be greater from the core to the periphery of the euro area than from the periphery to the core (Tables 7.4 and 7.5). If the periphery reformed alone, the core would gain  $\frac{1}{4}$  percent of real GDP. However, if the core reformed alone, the periphery would gain  $\frac{1}{2}$  percent of real GDP in the short term and  $1\frac{1}{2}$  percent of real GDP in the long term. First, the periphery exports more to the core than it imports, so if the core reforms by itself, the export increase by the periphery (and the positive effects on periphery real GDP) would

**Table 7.4. Structural Reforms in the Periphery, Decomposition of Real GDP**  
(Percent deviation from baseline)

	Year 1	Year 2	Year 5	Long Run
<b>Structural Reforms in the Euro Area Periphery</b>				
All reforms	0.7	1.5	4.1	13.6
Product and labor reforms	0.5	1.1	3.7	12.7
Product market reforms	0.2	0.6	2.0	8.6
Labor market reforms	0.1	0.2	0.7	2.2
Tax reforms	0.2	0.4	0.5	0.9
<b>Spillovers to the Euro Area Core</b>				
All reforms	0.2	0.3	0.2	0.3
Product and labor reforms	0.1	0.3	0.2	0.3
Product market reforms	0.0	0.0	0.1	0.3
Labor market reforms	0.0	0.1	0.0	0.0
Tax reforms	0.1	0.1	0.0	0.0

Sources: Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates

**Table 7.5. Structural Reforms in the Core, Decomposition of Real GDP**  
(Percent deviation from baseline)

	Year 1	Year 2	Year 5	Long Run
<b>Structural Reforms in the Euro Area Core</b>				
All reforms	0.8	1.6	3.4	10.2
Product and labor reforms	0.4	0.9	2.6	8.8
Product market reforms	0.1	0.3	1.3	5.4
Labor market reforms	0.1	0.2	0.7	2.1
Tax reforms	0.3	0.6	0.8	1.4
<b>Spillovers to the Euro Area Periphery</b>				
All reforms	0.5	0.9	0.6	1.6
Product and labor reforms	0.3	0.6	0.6	1.5
Product market reforms	0.0	0.1	0.3	1.4
Labor market reforms	0.1	0.1	0.1	0.0
Tax reforms	0.2	0.3	0.1	0.0

Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates.

be greater than vice versa. Second, the model assumes that productivity improvements would spill over from the more advanced core countries.<sup>7</sup> Finally, the model assumes that monetary policy would remain accommodative in the short term, leading to higher inflation, thereby reducing real interest rates and boosting real GDP.

Reforms in the periphery would boost competitiveness and help rebalancing, even if the core reforms simultaneously. The spillovers from increased productivity of one region to the other would lead to extra expansion of their productive capacities, further driving up both employment and real wages (Table 7.6). Consequently, greater gains occur in labor productivity under simultaneous reform. However, the decline in the real effective exchange rate and unit labor costs would not be as great in the long term under simultaneous reform—both regions are producing goods more cheaply, and one region could not have achieved the competitive advantage that would result if only one region had reformed. Nonetheless, in the simultaneous reform scenario, rebalancing between the core and the periphery would still occur because the periphery would depreciate against the core (albeit not as strongly) because it has a more comprehensive package of reforms, which would be reinforced by larger productivity spillovers from the core (larger than the effect of its own productivity reforms spilling over to the core).

In addition, simultaneous reform in both the core and the periphery would have a long-term positive, but modest, impact on the global economy. The rest of world's real GDP would be about ½ percent above baseline in the long term (Table 7.7). The short-term spillovers would be negative for the rest of the world because the euro would depreciate. However, in the long term, spillovers from the euro area would be larger, emanating from higher productivity levels and a positive income effect in the euro area that would increase the euro area demand for goods from the rest of world. Also, because the euro area debt-to-GDP ratio would decline by 20 percentage points from pension and unemployment reforms in the long term, a larger pool of global savings would be available for investment, thereby driving down the global real interest rate. This lower interest rate would lower the global cost of capital and stimulate the global economy.

### Reform Implementation: Macroeconomic and Policy Environment

Potential gains from structural reforms could be sizable, but various macroeconomic and policy factors may affect their actual impact. This section focuses on three such factors:

- Policy credibility;
- Short-term price stickiness; and
- Initial demand conditions.

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<sup>7</sup> Cross-country spillovers solely from trade linkages are relatively weak (as is the case in dynamic stochastic general equilibrium models in general), but technology and positive productivity spillovers can be important. We explicitly model a link in which productivity spills over from countries that reform to their closest trading partners based on work in Coe and Helpman (1995), Coe, Helpman, and Hoffmaister (1997), and Lumenga-Neso, Olarreaga, and Schiff (2005).

**Table 7.6. Structural Reforms Individually or Simultaneously***(Percent deviation from baseline)*

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 5</b>	<b>Long Run</b>
<b>Core when only Core Reforms</b>				
Real GDP	0.8	1.6	3.4	10.2
Employment	0.9	1.6	1.8	3.0
Real wages	0.1	0.2	0.8	6.1
Unit labor cost	0.2	0.3	-0.7	-0.8
Labor productivity	-0.2	-0.2	1.2	5.9
Real bilateral periphery exchange rate	0.0	-0.1	-0.9	-2.3
Real effective exchange rate	-0.3	-0.4	-0.9	-2.5
<b>Core when Entire Euro Area Reforms</b>				
Real GDP	1.1	2.1	3.7	10.6
Employment	1.4	2.4	2.0	3.0
Real wages	0.3	0.6	1.3	6.9
Unit labor costs	0.6	0.9	-0.4	-0.5
Labor productivity	-0.3	0.4	1.4	6.7
Real bilateral periphery exchange rate	0.0	0.1	0.3	1.5
Real effective exchange rate	-0.4	-0.5	-0.7	-1.8
<b>Periphery when only Periphery Reforms</b>				
Real GDP	0.7	1.5	4.1	13.6
Employment	0.7	1.4	2.3	4.2
Real wages	0.0	-0.2	0.4	7.7
Unit labor costs	0.0	-0.3	-1.3	-1.2
Labor productivity	-0.1	0.0	1.4	7.6
Real bilateral core exchange rate	0.0	-0.2	-1.1	-3.7
Real effective exchange rate	-0.2	-0.3	-1.1	-3.9
<b>Periphery when Entire Euro Area Reforms</b>				
Real GDP	1.4	2.7	4.8	15.4
Employment	1.7	2.9	2.6	4.2
Real wages	0.3	0.7	1.6	9.9
Unit labor costs	0.6	0.9	-0.6	-0.8
Labor productivity	-0.3	-0.3	2.0	9.7
Real bilateral core exchange rate	0.0	-0.1	-0.3	-1.5
Real effective exchange rate	-0.4	-0.4	-0.9	-3.2

Sources: Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates.

**Table 7.7. The Benchmark Scenario: Effects on the Rest of the World, Decomposition of Real GDP**

*(Percent deviation from baseline)*

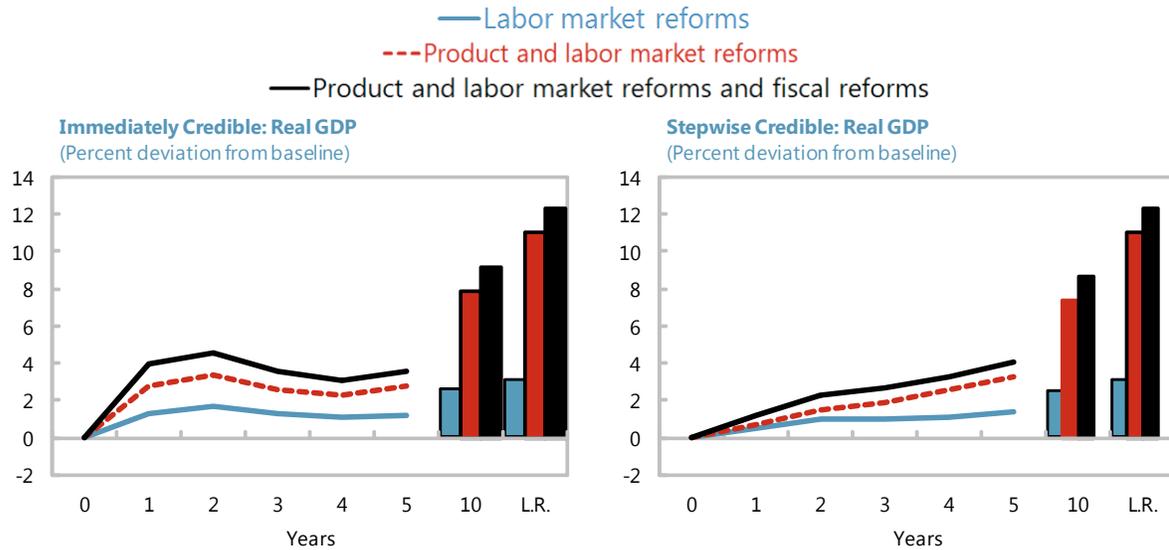
	Year 1	Year 2	Year 5	Long Run
<b>Euro Area</b>				
Total	1.2	2.3	4.1	12.3
Core	1.1	2.1	3.7	10.6
Periphery	1.4	2.7	4.8	15.4
<b>Rest of the World</b>				
Total	0.0	0.1	0.0	0.4
United States	0.0	0.0	0.0	0.3
Japan	0.0	0.0	-0.1	0.2
Emerging Asia	0.0	0.0	-0.2	0.0
Remaining countries	0.1	0.1	0.0	0.6

Sources: Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates.

### The Role of Policy Credibility

The speed at which gains could be realized in the euro area is affected by the degree of credibility of the announced reform packages. In the benchmark scenario, households and firms believe only gradually that the reform package will be fully implemented beyond the reforms carried out in the current year. If instead they immediately believed in implementation of the reform package as announced, the increase in real GDP would be faster (Figure 7.7). The households that can save would embrace the future increase in wealth from the promised continuation of the reform early on and would immediately increase their consumption.

The labor market would also behave very differently. If there were full policy credibility, households and firms would foresee the potential for future production, and more labor would be used in the short term, until such time that firms could invest enough to generate a higher capital stock to permanently increase their productive capacity. In the benchmark case, the labor response would be much weaker because no long-term changes in labor demand would be perceived initially. After the sixth year, labor would pick up as the full future benefits come to be understood, and firms still would not have enough capital in place. So, if households and firms believe in the future path of reform, employment would peak early (in year 3) and then decline. Otherwise, employment would build gradually and would peak at a lower level (in year 6), but the peak would be sustained for a longer time. Once households and firms fully believe in the reform package, the results are the same as under the case in which they believe in the reform package from the start.

**Figure 7.7 The Role of Credibility in the Benchmark Scenario**

Sources: Global Integrated Monetary and Fiscal Model simulations using OECD and IMF staff estimates  
 Note: L.R. is the long run (2060).

### The Role of Short-Term Price Stickiness

Competition-enhancing structural reforms reduce price and wage markups, but short-term costs of adjustment matter as well. Changes in markups would have short- and long-term effects on macroeconomic aggregates, but they do not directly affect the short-term dynamics of prices. In the short term, prices are driven by nominal adjustment costs present in the economy. In the benchmark scenario, changes in prices from any given shock take roughly 50 percent longer to work their way through the economy than in the most flexible major region, the United States. However, as markets become more competitive, the speed of price adjustment can be expected to increase.

An assumption of more flexible prices in the euro area does not materially affect the results. The analysis assumes that the monetary policy rule in the euro area has the same level of aggressiveness as in the United States, given that this property is related to the short-term stickiness of prices. The benchmark reform scenario is tested under this different assumption, without considering the transition path from higher to lower price stickiness. The outcomes can be read as the upper bound of the effects on the transition dynamics from their impact on product and labor market reforms (Table 7.8). The long-term results remain unchanged, while there are slightly greater gains in the short term because firms and households more rapidly adjust their prices and wages to reflect the future changes in the economy, thereby incurring lower costs from short-term inertia.

**Table 7.8. The Role of Price Stickiness in the Short Term, Decomposition of Real GDP***(Percent deviation from baseline)*

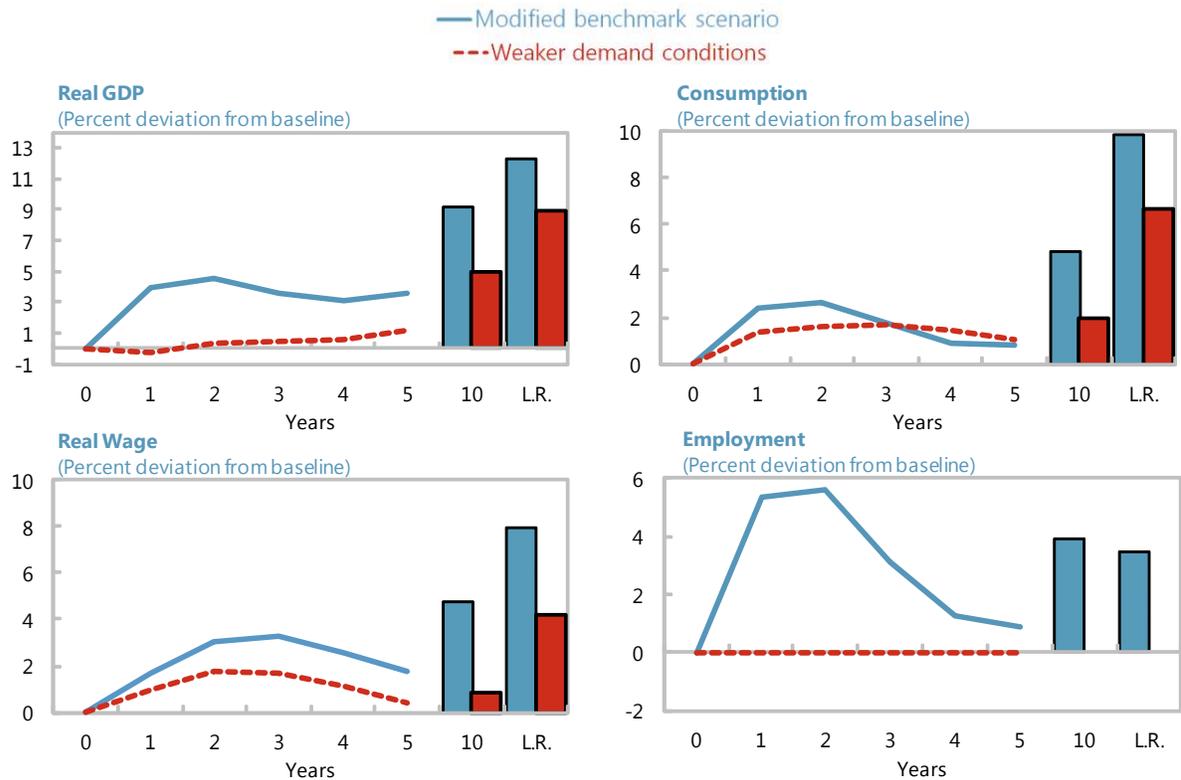
	Year 1	Year 2	Year 5	Long Run
<b>Euro Area</b>				
All reforms				
Benchmark scenario	1.2	2.3	4.1	12.3
Price stickiness similar to United States	1.8	2.8	4.0	12.3
Product market reforms				
Benchmark scenario	0.2	0.5	1.7	7.2
Price stickiness similar to United States	0.3	0.5	1.7	7.2
Labor market reforms				
Benchmark scenario	0.5	0.9	1.4	3.0
Price stickiness similar to United States	0.7	1.1	1.4	3.0
Tax reforms				
Benchmark scenario	0.4	0.7	0.8	1.2
Price stickiness similar to United States	0.5	0.8	0.8	1.2

Sources: Global Integrated Monetary and Fiscal model simulations using Organization for Economic Cooperation and Development and IMF staff estimates.

## The Role of Demand Conditions

Weak demand and excess capacity conditions may limit the short-term output response to reforms. In particular, balance sheet concerns and low confidence encumber private sector decisions, thereby weakening demand and possibly hindering the effectiveness of supply-side reforms. For example, relaxing employment protection may not stimulate hiring in the short term, but increase unemployment. Similarly, reducing unemployment insurance or increasing the retirement age would lower disposable income if those induced to seek work cannot find jobs. Overall, there are considerable uncertainties about the immediate effects of implementing structural reforms during a recession.

An illustration estimates the worst-case impact of weak demand conditions by assuming that firms would not hire any additional workers. No hiring would occur despite the increase in labor supply that comes from labor market reforms such as increased child care, ALMP, and reduced unemployment insurance benefits. In reality, labor demand would most likely increase in the long term, although the negative short-term effects could occur. Demand for other factors of production would also be lower compared with the benchmark scenario. To discuss the lower bound effectively, the analysis only considers the case in which reforms are immediately and fully believed in by households and firms, and compares this to the version of the benchmark scenario implemented in the same manner (as shown in the left panel of Figure 7.7).

**Figure 7.8 Impact of Weaker Initial Demand Conditions**

Sources: Global Integrated Monetary and Fiscal Model simulations using OECD and IMF staff estimates  
 Note: L.R. is the long run (2060).

The short-term impacts on real GDP would be substantial because real GDP would fall in the first year instead of increasing. The shortfall could be as high as 4 percent of real GDP (Figure 7.8), driven primarily by labor market reforms. Real wages would decline relative to the benchmark because the increase in labor supply would allow firms to slash wages, and the marginal product of labor would decline.

Product market and tax reforms would still be fairly effective in the medium term under restricted labor demand. Both sets of reforms act on both factors of production, capital and labor. So although employment may not increase in this scenario, capital will increase by almost enough to overcome the weakness in labor demand. On the demand side, labor income, on balance, would be lower than in the benchmark scenario, although households that save would experience higher wealth from the notable increase in the capital stock (which is an increase in the equity of firms). Moreover, the depreciation in the real effective exchange rate would be greater because all goods would be even cheaper, not only from the decrease in markups and increase in productivity from the reforms, but also from the long-term decline in real wages in response to rigid labor demand.

## Concluding Remarks

The analysis illustrates that structural reforms in the euro area can increase its real GDP markedly, though it may take time for their full potential to be achieved. Structural reforms are critical to improving the long-term capacity of economies to grow through both more intensive use of resources and higher productivity. Weak demand conditions may dampen the already small short-term impact. The long-term gains are largest in the periphery countries, where growth is most needed. Reforms would also boost euro area competitiveness. The largest gains for euro area countries could come from product market reforms; labor market reforms could have a positive but more modest impact on real GDP. Simultaneous implementation of product and labor market reforms would generate an additional GDP payoff.

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**ASSESSING THE ROLE OF LABOUR MARKET POLICIES  
AND INSTITUTIONAL SETTINGS ON UNEMPLOYMENT:  
A CROSS-COUNTRY STUDY**

**Stefano Scarpetta**

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## INTRODUCTION

Unemployment varies greatly across OECD countries and over time. During the past two decades, it was relatively trendless, albeit subject to cyclical fluctuations, in Japan and the United States, while it rose dramatically in many European countries. In the latter, unemployment rates also showed a high persistence. After rising during cyclical downturns, they tended to remain at (or close to) new higher levels after subsequent recoveries, suggesting that most of these increases were translated into higher "equilibrium" unemployment. For example, in EU countries, the rate of unemployment consistent with stable wage inflation (NAWRU) rose, more or less steadily, from less than 5 per cent in the mid-1970s to almost 10 percent in the early 1990s, while in the United States, the rise in the 1970s was partially reversed thereafter and the NAWRU is currently around 5 per cent.

High unemployment levels in Europe were accompanied by a growing incidence of long-term unemployment (LTU), from less than one-third of total unemployment in the late 1970s to almost 45 per cent in the early 1990s. In contrast, the incidence of LTU has remained relatively constant in the United States and Japan at about 10 and 15-20 per cent, respectively. There are also major differences in participation rates. The major European countries often have more than 40 per cent of their working-age population inactive (i.e. unemployed and not in the labour force). This compares with only a quarter in Japan and less than one-third in North America, Oceania and the Nordic countries.

As stressed in the OECD *Jobs Study* (1994b), an ensemble of factors – macroeconomic policies, trade and foreign direct investment, technology and innovation – interact with labour and product market policies and institutions, such as education and training, wage and price determination processes and welfare benefits, to determine the levels and dynamic behaviour of employment and unemployment rates across countries. The OECD work on the *Jobs Study* indicates that a number of these policy and institutional factors have played an important role in determining unemployment rates. This paper tries to assess the role of some of these factors.

The empirical analysis is conducted from two perspectives. Firstly, it examines the role that different policy and institutional settings have played in determining the marked differences in the level of structural or "equilibrium" unemployment

across the OECD countries during the past decade. Secondly, it looks at the role of these same policy and institutional factors in determining the persistence of unemployment

The results encompass most of the previous cross-country studies comparing labour market performance and, in particular, those of Layard *et al* (1991) and Bean and Symons (1989). They also offer new insights as to how policies and the mechanisms of wage determination may affect aggregate unemployment and other measures of labour market slack, such as youth and long-term unemployment rates and non-employment rates.<sup>2</sup> The use of these other measures of labour market slack gives a better understanding of the mechanisms through which distortions in the labour market affect unemployment and gives a better identification of potential beneficiaries of reforms

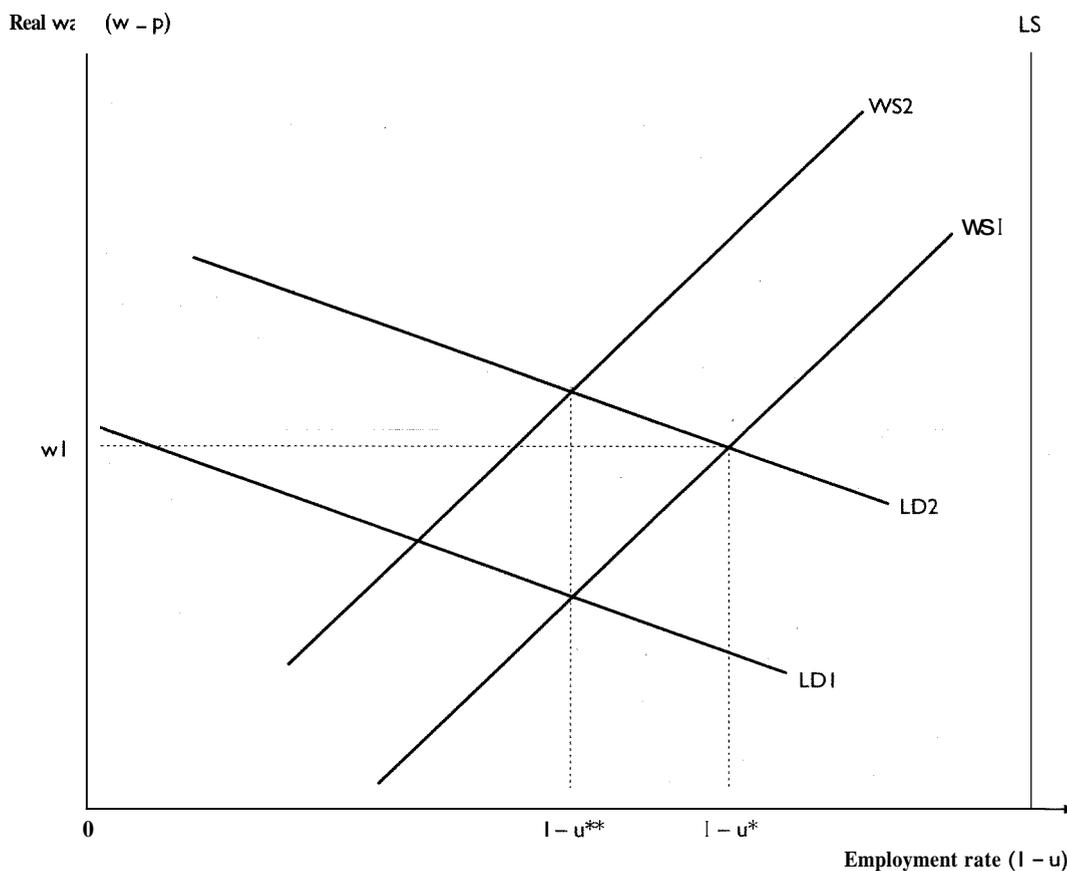
The broad empirical conclusions suggest that policy variables and the institutional mechanisms of wage determination do matter for the **level** of structural unemployment as well as for the **speed of labour market adjustment** in the OECD countries. In particular, overly generous unemployment benefits and stringent employment protection regulations contribute to raise equilibrium unemployment and reduce the speed of labour market adjustment after an exogenous shock. The different facets of countries' wage bargaining systems interact strongly. Insofar as its effect can be isolated, the paper suggests that greater co-ordination amongst the social partners is always beneficial to labour market performance, regardless of the degree of unionisation. The relationship between the degree of centralisation of wage bargaining and unemployment is more complex. In general, the results support the *hump-shaped* hypothesis whereby both highly centralised and fully decentralised wage bargaining systems offer the best results.

The paper is divided into four sections. The first section presents briefly the theoretical framework underlying the study and discusses some methodological issues related to the empirical analysis. The second section outlines the policy and institutional variables used, while the empirical results are discussed in the third section. The final section summarises the main findings.

## THE THEORETICAL FRAMEWORK AND THE ESTIMATION PROCEDURE

### The theoretical framework

Figure 1 presents a simple model of equilibrium in the labour market. The model assumes an economy of imperfectly competitive profit-maximising firms, each facing exogenously determined product market conditions and predetermined capital and technology (see Layard *et al.*, 1991 and Bean, 1994). Moreover, wages are bargained between workers and firms, the latter deciding on the level of employment, output and prices once a wage agreement has been reached ("right-to-manage" model). Ignoring for simplicity labour force growth and trend productivity

Figure 1. *Labour demand and wage-setting schedules*

Source: OECD.

effects, this simple model can be summarised on the basis of the following relationships:

– **labour demand schedule (LD):**

$$n = -\alpha(w - p) - \beta Z_n - w^u \quad \alpha > 0 \quad [1]$$

– where  $n$ ,  $w$  and  $p$  are respectively the logarithms of employment, wages (including payroll taxes) and prices,  $Z_n$  is a vector of variables influencing labour demand, which may include a mark-up of prices over marginal costs, and  $w^u$  is unanticipated wages which account for expectational errors.

- **wage-setting schedule (WS):** real wages are assumed to be a decreasing function of unemployment and an increasing function of wage push factors ( $Z_w$ ),<sup>3</sup> allowing for unanticipated price changes  $p^u$ . Thus

$$w - p = \delta_1 Z_w - \gamma_1 u - p^u \quad \delta_1 \geq 0; \gamma_1 \geq 0 \quad [2]$$

The  $Z_w$  vector should include factors such as the generosity of unemployment benefits, the relative strength of unions and the overall features of the wage bargaining process, as well as the tax wedge on the use of labour and the degree of mismatch between the skills and geographical location of job seekers on the one hand and those of the unfilled job vacancies, on the other. The parameter  $\gamma_1$  measures the impact of unemployment on wage setting and is likely to be affected by some of the factors included in  $Z_w$ .

- **labour supply (LS)** is assumed, for simplicity, inelastic to wages and a function of factors affecting participation decisions ( $Z_p$ ), including some of the elements of wage push ( $Z$ )

$$l = \delta_2 Z_p \quad \delta_2 > 0 \quad [3]$$

where  $l$  is the logarithm of the labour force

Since  $l - n \equiv u$ , equation [1] can be re-written as

$$l - u \equiv -\alpha(w - p) - \beta Z_n - w^u \quad [4]$$

The structural unemployment rate  $u^*$  is the value that solves equations [2], [3] and [4] when price and wage expectations are met (*i.e.*  $p^u = w^u = 0$ )

$$u^* = \frac{\alpha \delta_1 Z_w}{1 + \alpha \gamma_1} + \frac{\delta_2 Z_p + \beta Z_n}{1 + \alpha \gamma_1} \quad [5]$$

which is illustrated in Figure 1 at the intersection of the labour demand and wage-setting curves in the  $(1 - u, w - p)$  space

From equation [5] any factor that exogenously increases wage-push ( $Z$ ) or labour demand shifts ( $Z$ ) (e.g. an increase in the mark-up) would raise equilibrium unemployment. In the first case, the raise in equilibrium unemployment will be accompanied by an increase in real wages, while in the second case, it will be accompanied by a fall in real wages. As an illustration, a leftward shift in the WS schedule (from WS1 to WS2) could be the result of an increase in workers' power in wage bargaining. By the same token, a leftward shift (from LDI to LD2) of the labour demand schedule may result from reduced competition in the product market which would lead to persistently higher price mark-ups. In both cases, the equilibrium unemployment rate shifts to a higher level ( $u^{**}$  in Figure 1), and this increase would not be reversed by endogenous forces<sup>4</sup>

The policy and institutional factors which enter the wage-setting schedule [2] may influence not only the long-run equilibrium unemployment, but also the speed with which the labour market reacts to an exogenous shock. In the context of the bargaining model set up by equations [1] and [2], persistence mechanisms could be brought in by allowing wages to be a function of the change in unemployment as well as the level of unemployment. The rationale for this specification of the wage-setting schedule can be found in the behaviour of both firms and workers. High hiring and firing costs may introduce inertia in the firms' employment decisions. On the basis of the "insider-outsider" hypothesis (see below), it could also be argued that real wages may be more responsive to the threat of large-scale redundancy and rising unemployment than to the level of unemployment *per se*. Likewise, in the context of rising unemployment, the proportion of short-term unemployed (*i.e.* those most likely to compete directly with the employed) generally increases and this could put more downward pressure on wages than a stable level of unemployment

The introduction of the change in unemployment in the process of wage determination yields a new wage-setting schedule [2'] and allows for the definition of a short-term equilibrium unemployment ( $su^*$ ) as opposed to the long-term equilibrium defined by [5]

$$w - p = \delta_1 Z_w - \gamma_1 u - \gamma_2 \Delta u - p^u \quad \gamma_2 \geq 0 \quad [2']$$

The parameter  $\gamma_2$  is likely to be affected by labour market policies, via their impact on the effectiveness of job search and on its intensity, as well as by institutional factors influencing the insiders' power in wage bargaining.

The long-run steady-state equilibrium  $u^*$  has not changed as  $\Delta u = 0$  in equilibrium. However, in the short term, structural unemployment depends upon  $u_{t-1}$ . In particular,

$$su_t^* = \frac{-\alpha\delta_1 Z_w + \delta_2 Z_p + \beta Z_n}{1 + \alpha\gamma_1 + \alpha\gamma_2} + \frac{u_{t-1}}{1 + \frac{\alpha\gamma_1}{\alpha\gamma_2}} \quad [6]$$

or

$$su_t = \lambda u_{t-1} + (1 - \lambda)u^* \quad [6']$$

and the adjustment speed

$$(1 - \lambda) = \frac{1 + \alpha\gamma_1}{1 + \alpha\gamma_1 + \alpha\gamma_2} \quad [7]$$

The adjustment speed depends upon the flexibility of wages to the level ( $\gamma_1$ ) and changes ( $\gamma_2$ ) in unemployment. When the estimated coefficient  $(1 - \lambda)$  lies

between 0 and 1, there is said to be partial hysteresis or slow adjustment (Elmeskov and MacFarlan, 1993), while a coefficient equal to 0 points to full hysteresis.

### Estimation procedure

Equations [5] and [6] offer the basic framework for the analysis of cross-country variations of unemployment. In particular, two questions should be addressed. How do labour market policies and institutional factors affect the equilibrium unemployment rate  $u^*$ ? Moreover, how do these factors influence the speed of adjustment  $(1 - \lambda)$ ? To make the best use of the information available, these two questions are treated in turn.

To address the first question, we estimated the relative importance of policy and institutional variables in determining the wide disparities in structural unemployment and the potential effects of reforms, using a **static model** over the 1983-1993 period. The period corresponds, more or less, to a full business cycle, over which structural unemployment has remained relatively stable in most OECD countries, at least compared with the dramatic increases of the 1970s and early 1980s. This is also the period for which most of the information is available on several institutional features of the labour market and on labour market policies.

Since the policy and institutional factors are likely to have different impacts on different groups of the unemployed population and on participation decisions, four different measures of labour utilisation were used as the dependent variable: i) the total unemployment rate; ii) the youth unemployment rate, iii) the long-term unemployment rate; iv) and the non-employment rate. Comparisons between the results of the four different equations may offer a more complete picture of the effects of labour market policies and institutional factors on the labour market and help the identification of potential beneficiaries of reforms. Nevertheless, the use of the same specification for all four measures implies that a portion of cross-country variation remains unexplained as certain specific factors – such as minimum wages in the youth equations – are omitted from the analysis.

Using cross-country and time-series data and adding an explanatory variable to account for the effects of aggregate demand fluctuations over the cycle, the actual unemployment rate and the other three measures of labour market slack can be modelled by a reduced-form equation with the following structure

$$u_{it} = \mu_0 + \mu_i + \sum_k \beta_k x_{kit} + \sum_j \tau_j z_{ji} + \phi g_{it} + v_{it} \quad [8]$$

where  $i$  indexes countries,  $t$  the years,  $u_{it}$  is the unemployment rate (or one of the other measures of labour market slack),  $x_{it}$  is a  $k \times 1$  vector of time-varying explanatory variables,  $z_i$  is a  $j \times 1$  vector of variables which vary across countries but not over time,<sup>5</sup>  $\mu_0$  is a constant,  $\mu_i$  is the country-specific effect not accounted for by the available explanatory variables and  $v_{it}$  is the usual error term. Both  $x_{it}$  and  $z_i$

vectors consist of policy and institutional variables deemed likely to affect labour market conditions, while  $g_t$ , is the output gap (see below) included to account for changes in the business cycle

To shed some light on the speed of labour market adjustment, a **dynamic** version of the unemployment rate equation is also estimated over the 1970-1993 period, which encompasses the upsurge in unemployment after the two oil shocks. In this case, actual unemployment rate ( $u_{it}$ ) is expressed as the sum of the short-term equilibrium rate ( $su_{it}^*$ ) – which, from equation [6], is a function of lagged actual unemployment rate and the long-run steady-state equilibrium rate ( $u_i^*$ ) – plus a cyclical component which is identified using the output gap variable. From equation [7] the coefficient on lagged unemployment rate ( $\lambda$ ) mainly depends on the parameters  $\gamma_1$  and  $\gamma_2$  which, in turn, are functions of the labour market and institutional factors included in the  $\mathbf{x}_{it}$  and  $\mathbf{z}_i$  vectors. The long-run steady-state equilibrium unemployment ( $u_i^*$ ) is proxied by country-specific effects  $\mu_i$  and the few time-varying explanatory variables ( $\mathbf{x}_{it}$ ) for which long time-series are available<sup>6</sup>. Thus, the reduced-form unemployment equation can be written as

$$u_{it} = \mu_i + \left[ \mu_0 + \sum_k \delta_k x_{kit-1} + \sum_j \phi_j z_{ji} \right] u_{it-1} + \sum_k \beta_k x_{kit} + \phi g_{it} + v_{it} \quad [9]$$

where the notation is the same as for equation [8]<sup>7</sup>

## EXPLANATORY VARIABLES

### Cyclical factors

At any point in time, countries can differ in their relative position in the business cycle and in the amplitude of the cycle around the long-run trend. These differences are likely to affect the size and dynamic behaviour of the cyclical component of actual unemployment rates. To account for these factors, we used a measure of the output gap (GAP) defined as the percentage difference between actual and the long-run trend output, the latter obtained using a GDP smoothing approach based on the Hodrick-Prescott filter<sup>8</sup>. It should be stressed that, like any other index of the cycle, the output gap measure is not an exogenous variable, although it is reasonable to assume that it is economically predetermined (in the sense that changes in the cycle drive changes in employment and unemployment and not vice versa)

### Policy variables

#### *Active labour market policies*

Active labour market policies (ALMP) encompass different measures, including

and different forms of subsidised employment (OECD, 1993) These policies may reduce aggregate unemployment by shifting rightward the WS schedule of Figure 1<sup>9</sup> For example, raising the search effectiveness of job seekers could lead to greater efficiency in job matching and reduced real wage pressure,<sup>10</sup> which in turn would reduce the duration of Unemployment spells and raise employment (Layard and Nickell, 1986). Moreover, the enhanced qualifications of participants in training schemes are likely to raise their productivity once at work (OECD, 1993). On the other hand, the existence of generous active programmes may be taken by unions or employed workers as a signal of accommodation, which will raise wage pressure, shifting the WS schedule leftward and contributing to longer duration of unemployment spells and higher overall unemployment rates.

The government's commitment to active labour market policy is proxied by expenditure on active measures per unemployed person relative to output per capita (ALMPU) as in Layard *et al* (1991)<sup>11</sup> The per-capita measure takes into account a potential non-linearity in the relationship between active programmes and unemployment<sup>12</sup> However, the introduction of ALMPU in the unemployment equation is likely to lead to a simultaneity bias in the estimated parameters.<sup>13</sup> This would occur if governments react to changes in unemployment – or other signals of labour market conditions – with changes in total spending on ALMPs, which makes it difficult to disentangle the effect of active policy on the labour market We tried to minimise this problem by entering ALMPU as a fixed effect, using the average spending over the entire period for which data are available (1985-1993)

However, a further difficulty in determining the impact of ALMPs on unemployment arises if (some) programme participants are simply excluded from the count of unemployed job seekers although they are looking for work Under these circumstances, an obvious effect of increasing expenditures on – and participation in – ALMPs is to reduce “measured” unemployment without any change in “actual” unemployment Indeed, evidence indicates that in many OECD countries there is a positive correlation between unemployment dynamics and participation in active programmes<sup>14</sup> As unemployment rises, participation in ALMP increases, which suggests that the absolute number of “hidden” unemployed workers may increase when unemployment is high. For these reasons, when interpreting the impact of ALMP on measured unemployment, it is necessary to keep in mind this possible bias

### ***Unemployment benefits***

A large number of both macro and micro studies<sup>15</sup> (including the OECD *Jobs Study*) suggest that the level and especially the duration of unemployment benefits are likely to affect overall unemployment and its persistence Unemployment benefits may be expected to raise beneficiaries' reservation wages, thereby reducing

their search efforts and their willingness to accept job offers (*i.e.* leading to a leftward shift in the WS schedule) Moreover, generous benefits may reduce the insiders' (employed individuals) willingness to restrain their wage claims in the face of unemployment pressure (*i.e.* a flatter WS schedule in Figure 1). On the other hand, unemployment benefits act as a subsidy to job search, helping to overcome an asymmetric-information externality and contributing to better job matching and, thus, lower unemployment (via a rightward shift in WS)

The full complexity of the unemployment benefit system (UB)<sup>16</sup> is approximated in this study by a summary index of benefit entitlements derived from the OECD *lobs Study* (Chapter 8) The UB index is based on a simple average of net (after-tax) replacement rates for individuals with different durations of the unemployment spell, different levels of earnings and different family situations.<sup>17</sup> In the overall unemployment equations and in the non-employment equations, the index includes all duration categories (1-5 years), while in the LTU equations the summary index (UB2) includes replacement rates for durations longer than 12 months and in the youth unemployment equations the index (UB3) includes only replacement rates for the first 12 months<sup>18</sup> These measures partially overcome the simplification involved in representing the unemployment compensation system by a crude replacement rate and/or by a measure of maximum duration (Atkinson and Micklewright, 1991). Nevertheless, since these indices summarise different situations, they are inevitably somewhat arbitrary and do not differentiate the role of each individual component of the UB system in explaining unemployment (Martin, 1996).

### ***Employment protection legislation (EPL)***

In many countries, especially in Europe, the freedom of firms to hire and fire workers is limited by a variety of "employment protection" regulations.<sup>19</sup> As stressed in the OECD *lobs Study*, these regulations, if binding, are likely to operate in two directions. On the one hand, they may reduce arbitrary dismissals; lower contracting costs by setting general rules and standards, encourage on-the-job training and human capital formation (thereby raising productivity and earnings of "insiders") and, finally, provide for early warnings to allow workers to engage in job search prior to being laid off On the other hand, if firms feel that these regulations oblige them to retain workers who are no longer needed, they may become cautious in hiring and more selective in the choice of applicants, to the particular detriment of disadvantaged workers (often low-skilled, long-term unemployed and youth) Moreover, EPL may affect the structure of employment by indirectly promoting atypical (*i.e.* part-time and temporary) labour contracts which offer firms the workforce flexibility they would not have otherwise enjoyed, but which may act to consolidate insider power (Bentolila and Dolado, 1994)

As a proxy for the strictness of employment protection regulations, this paper uses the average of two indices measuring the strictness of EPL rules for regular and fixed-term contracts (see OECD *lobs* Study; and Grubb and Wells, 1993). While a relatively crude measure, this index offers a more complete picture of the different factors affecting decisions to hire and fire workers than other measures used in the literature, such as those based on employer surveys alone, as in (Emerson, 1988).<sup>20</sup>

### ***Non-wage labour costs***

Taxes on labour use have often been identified as a factor shaping the wage formation process and factor utilisation. A tax wedge on the use of labour can be defined as the difference between gross labour costs to employers and the consumption wage (net of direct and indirect taxes) paid to employees. This difference is affected by several elements – which vary a great deal across countries – including employees' and employers' social security contributions, income taxes and indirect taxes.

The macroeconomic impact of a change in the tax wedge depends on the reactions of both firms and workers. For example, in a perfectly competitive environment, an increase in payroll taxes will have no long-run effects on unemployment, insofar as wages will adjust to whatever level is needed to clear the market. However, if markets are imperfect and workers are able to resist offsetting wage cuts, an increase in these taxes may result in lower employment (*i.e.* a leftward shift in the LD schedule)<sup>21</sup> The occurrence of the latter depends, among other things, on the relative bargaining strengths of trade unions and employers (in the  $Z_w$  vector of {2}), and on firms' ability to pay wages in excess of market-clearing levels, which may also depend upon the degree of competition in the product market (in the  $Z_n$  vector of {1}). Moreover, an increase in taxes may be particularly detrimental to the employment prospects of certain categories of workers, such as low-paid workers, but not for others. For example, in the case of low-paid workers, employers may not be able to reduce wages to compensate for an increase in social security contributions if binding wage floors are established by statutory minimum wages, negotiated wage floors or high reservation wages induced by social welfare provisions.

Given data availability, the tax wedge indicator (TWEDGE) used here is based on average tax rates for average production workers, including employers' and employees' social security contribution rates, personal income tax rates and, finally, indirect tax rates (See Annex A for details) However, a marginal tax wedge is also considered using a smaller sample of countries to test whether the impact on unemployment differs

## Institutional factors

### *Unions and the wage bargaining process*

The wage bargaining process can play a crucial role in determining labour-market conditions and the speed of adjustment. For example, in the wage bargaining model set up in the previous section, wages may remain above market-clearing levels because the institutional system gives employees market power, thereby raising wages (*i.e.* a leftward shift in the WS schedule of Figure 1). However, these effects may be moderated, or even reversed, in contexts of fully centralised wage bargaining or when there is a high level of co-ordination among employers and among unions.

One common indicator of the character of industrial relations in a number of “insider-outsider models” is union density (the proportion of workers who are members of trade unions). Yet, a high degree of unionisation is not *per se* sufficient evidence of workers’ market power. In many countries, the administrative extension of wage agreements means that workers who are not union members are often covered by the terms and conditions of union contracts. By the same token, high union power in one sector can lead to spillover effects in non-union sectors (Blanchard and Kiyotaki, 1987).

In an effort to accommodate these elements, a measure of union density is complemented by two alternative indicators of the nature of the wage formation process: *i)* the degree of centralisation of wage bargaining, and *ii)* a measure of the degree of co-ordination among employers and among employees in the wage bargaining process.

A highly centralised wage bargaining system may allow the economy to respond in a more consistent way to adverse shocks than decentralised systems in which different groups/sectors/companies negotiate separately over wages (Tarantelli, 1986; Bruno and Sachs, 1985). However, Calmfors and Driffill (1988) have stressed that the relationship between centralisation of wage bargaining and wage outcomes is not monotonic, but rather hump-shaped.<sup>22</sup> The hump-shaped hypothesis suggests that both highly centralised (co-operative) bargaining structures – such as those in Austria and the Nordic countries – and fully decentralised (competitive) structures (United States) offer the best results.<sup>23</sup> In an intermediate (*ie* neither highly centralised nor highly decentralised) system – as in many EU countries – bargaining units are strong enough to generate dis-employment effects, but at the same time, each unit is vulnerable to other units’ wage strategies without being able to influence these strategies (a sort of “prisoner’s dilemma”).

Co-ordination refers to the extent to which decisions taken by trade unions and employers’ associations at the different bargaining levels (national, sectoral or company) are concerted so as to foster a mutually beneficial strategy.

The different equations estimated in this paper include the degree of unionisation together with either the indices of centralisation of wage bargaining or co-ordination as separate explanatory variables<sup>24</sup> In the first case, the country ranking of the relative degree of centralisation suggested by Calmfors and Driffill (CLWB) and its square (CLWB2) are included to account for the hump-shaped hypothesis In the second case, the Layard *et al* (1991) indices of employers' co-ordination (ECOOR) and employees' co-ordination (UCOOR) are used, or, alternatively, a summary measure of overall co-ordination (COOR), which sums the ECOOR and UCOOR indices. In the unemployment and non-employment equations, one would expect: a positive sign on CLWB and a negative sign on its square CLWB2 (the measure of corporatism is based on rankings in which lower numbers refer to higher levels of centralisation); a negative sign for both the index of employers' co-ordination and the index of unions' co-ordination

### ***Exposure to trade as a proxy for product market competition***

The lack of competition in the product market may have direct as well as indirect effects on the labour market In the presence of market power, profit-maximising firms will set prices above the marginal cost of production and consequently labour demand will be lower than otherwise would have been the case Moreover, employers may share product-market rents with their employees (insiders) (Geroski *et al.*, 1996) thereby raising wages above competitive levels and reducing employment levels. The combination of wage premia and low employment in non-competitive sectors may have spillover effects on other sectors of the economy in different ways, As stressed above, the automatic extension of wage agreements may also distort the balance between costs and productivity in more competitive sectors; the unemployed may prolong their search in the hope of acceding to highly paid jobs; and, finally, dismissed workers from "high-wage" firms may have very high reservation wages, especially in countries with earning-related unemployment benefits (OECD *Jobs Study*, Chapter 5)

Unfortunately no direct measure is available on the overall degree of product market competition in OECD countries. Indirect information can, however, be gathered from trade data In particular, measures of openness to foreign trade may shed some light on the degree of competitiveness to which domestic firms are exposed As a proxy for the pervasiveness of trade restrictions, a summary index was calculated on the basis of sectoral data on tariff rates and the frequency of non-tariff barriers (see Annex B for details) The larger the trade restrictions index (TRESTR), the more protected the domestic economy is However, insofar as countries differ a great deal in the relative importance of trade in national income (not least because of their size), the TRESTR index by itself may not necessarily offer an accurate picture of the effects of different trade policies on competition and resource allocation For example, two countries starting with the same levels of trade restrictions

but having different overall degrees of exposure to foreign trade may experience different output and employment effects by implementing the same trade reform package. Thus, an additional variable was introduced (INTER) which measures the interaction between TRESTR and an index of exposure to foreign competition (COMP). The latter combines an index of export intensity and an index of import penetration (see Annex A for details).

## Other factors

### *Real interest rates*

Several recent studies suggest that the significant increases in real interest rates during the 1980s, driven by increases in the public debt of many OECD countries, might have been among the driving factors behind the upsurge in unemployment, at least in countries where persistence mechanisms are at work. In particular, Phelps (1992, 1994) put forward several models in which real interest rates may affect unemployment. For example, in his “customer market” model of pricing, Phelps suggests that a reduction in real interest rates increases the incentives to invest in expanding market shares. Thus, the reduction in marginal production costs resulting from a fall in interest rates is likely to be followed by a reduction in price mark-ups which, in turn, should have positive effects on employment. Moreover, in an inter-temporal model, if workers have non-wage income, an increase in the rate of interest may reduce the expected utility of being employed. Along the same lines, Manning (1991) suggested that a higher interest rate – which in his model proxies the discount factor that workers apply to the value of potential future employment – reduces the opportunity cost of being unemployed in the future and makes workers more aggressive in their current wage claims.

Given the highly integrated world capital market, the paper uses a measure of the world real interest rate based on a CDP-weighted average of domestic long-term rates.<sup>25</sup>

### *The terms of trade*

It has also been argued that the deterioration of the terms of trade following the two oil shocks might have affected equilibrium unemployment insofar as it created a wedge between value-added prices and consumer prices.<sup>26</sup> This would then affect unemployment through much the same mechanisms as discussed above for the tax wedge. Since the potential impact depends on each country’s exposure to trade, the terms-of-trade variable (TERMS) was weighted by the average of the COMP index which, as described above, measures the degree of exposure to foreign trade.

## EMPIRICAL RESULTS

### The structural determinants of unemployment

Equation [8] was used to assess the role of policy and institutional factors in determining cross-country variations in structural unemployment. The analysis is based on annual data over the 1983-1993 period for a group of OECD countries (from 15 to 17 countries depending upon data availability under the different specifications)<sup>27</sup> Since the precise structure of the models was not known, Hendry's "general-to-particular" estimation approach was used to maximise the efficiency of estimates while allowing for a parsimonious specification. A sequential approach was used to identify the appropriate estimation technique: each equation was first estimated using OLS and the presence of unobservable country-specific effects was verified by a conventional F-test.<sup>28</sup> When the null hypothesis of cross-country equality of the constant term was rejected at conventional significance levels, error-components models using Feasible Generalised Least Squared (FGLS) were considered. The assumption that country-specific effects are random was tested using Honda's (1985) test. If the null hypothesis of non-randomness of country-specific effects was rejected, Hausman's (1978) orthogonal test was used to test for the correlation between the random country-specific effects and the other regressors, as suggested by Hausman and Taylor (1981)<sup>29</sup>

### *Regression results*

Table 1 presents the results of the reduced-form regressions on the total unemployment rate. Tables 2 to 4 present the results for youth unemployment rates, LTU rates and non-employment rates, respectively. The statistical tests discussed above are reported at the bottom of each table. Two basic specifications are used for the wage bargaining system: one with the two co-ordination variables (COOR) (see columns 1 to 7), and another with CLWB and its square replacing COOR (columns 8 to 10). In both cases, union density (UDENS) enters as well. Columns 3 to 5 report estimates incorporating the tax wedge, the terms of trade and the real interest rate, respectively. However, these variables have been omitted in the following steps if their coefficients were not statistically significant. The number of observations used in each equation and the number of countries included in the panel are reported at the bottom of each table.<sup>30</sup>

As expected, the F-tests reject strongly the hypothesis of no country-specific effects in all equations. Moreover, in all equations, the hypothesis of randomness of the country-specific effects cannot be rejected by the Honda test at standard statistical levels. Finally, the Hausman tests suggest possible problems of specification in only a few equations, at the 1 per cent critical level. In these cases, the value of the Hausman test is reported in bold.<sup>31</sup>

Table 1 Estimates of reduced-form unemployment rate equations 1983-1993<sup>1</sup>  
Feasible generalised least-squares

Explanatory variable <sup>2</sup>	Equation version number									
	1	2	3	4	5	6	7	8	9	10
	Estimated coefficients									
ALMPU	<b>-0.04*</b> <i>-1.65</i>	<b>-0.05*</b> <i>-1.67</i>	<b>-0.05*</b> <i>-1.72</i>	<b>-0.05*</b> <i>-1.68</i>	<b>-0.06*</b> <i>-1.83</i>	<b>-0.05*</b> <i>-1.65</i>	<b>-0.05*</b> <i>-1.65</i>	<b>-0.04</b> <i>-1.17</i>	<b>-0.05</b> <i>-1.40</i>	<b>-0.05</b> <i>-1.19</i>
UB	<b>0.14***</b> <i>745</i>	<b>0.13***</b> <i>696</i>	<b>0.13***</b> <i>678</i>	<b>0.13***</b> <i>701</i>	<b>0.13***</b> <i>699</i>	<b>0.13***</b> <i>635</i>	<b>0.13***</b> <i>701</i>	<b>0.13***</b> <i>618</i>	<b>0.12***</b> <i>591</i>	<b>0.13***</b> <i>612</i>
EPL	<b>0.31**</b> <i>242</i>	<b>0.37***</b> <i>264</i>	<b>0.37***</b> <i>264</i>	<b>0.37***</b> <i>268</i>	<b>0.39***</b> <i>274</i>	<b>0.27*</b> <i>1.75</i>	<b>0.37***</b> <i>266</i>	<b>0.12</b> <i>0.62</i>	<b>0.10</b> <i>0.57</i>	<b>0.13</b> <i>0.64</i>
UDENS	<b>0.10***</b> <i>466</i>	<b>0.11***</b> <i>494</i>	<b>0.11***</b> <i>465</i>	<b>0.11***</b> <i>474</i>	<b>0.13***</b> <i>516</i>	<b>0.11***</b> <i>481</i>	<b>0.11***</b> <i>488</i>	<b>0.12***</b> <i>475</i>	<b>0.12***</b> <i>468</i>	<b>0.12***</b> <i>471</i>
ECOOR	<b>-4.75***</b> <i>-4.57</i>									
UCOOR	<b>-0.80</b> <i>-0.61</i>									
COOR		<b>-3.08***</b> <i>-5.74</i>	<b>-3.07***</b> <i>-5.95</i>	<b>-3.07***</b> <i>-5.86</i>	<b>-3.18***</b> <i>-5.86</i>	<b>-2.62***</b> <i>-4.24</i>	<b>-3.08***</b> <i>-5.89</i>			
CLWB								<b>2.19***</b> <i>2.63</i>	<b>0.76</b> <i>0.75</i>	<b>2.19***</b> <i>2.63</i>
CLWB2								<b>-0.08*</b> <i>-1.75</i>	<b>0.01</b> <i>-0.12</i>	<b>-0.08*</b> <i>-1.75</i>
GAP	<b>-0.52***</b> <i>-1.650</i>	<b>-0.52***</b> <i>-1.640</i>	<b>-0.52***</b> <i>-1.610</i>	<b>-0.52***</b> <i>-1.600</i>	<b>-0.51***</b> <i>-1.620</i>	<b>-0.52***</b> <i>-1.640</i>	<b>-0.52***</b> <i>-1.630</i>	<b>-0.51***</b> <i>-1.610</i>	<b>-0.51***</b> <i>-1.610</i>	<b>-0.51***</b> <i>-1.610</i>
TWEDGE			<b>0.01</b> <i>0.12</i>							
TERMS				<b>-0.36</b> <i>-0.24</i>						
IRL					<b>-0.12</b> <i>-1.44</i>					
TRESTR						<b>0.03</b> <i>1.42</i>			<b>0.06**</b> <i>2.16</i>	
INTER							<b>-0.43</b> <i>-0.11</i>			<b>0.72</b> <i>0.18</i>
Adj R <sup>2</sup>	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
SEE	0.92	0.91	0.91	0.91	0.90	0.91	0.91	0.91	0.91	0.91
N of observations	181	181	181	181	181	181	181	181	181	181
N of countries	17	17	17	17	17	17	17	17	17	17
F-test	53.7***	74.0***	67.0***	69.0***	76.0***	68.7***	68.5***	1229***	99.7***	121.6***
Honda test	20.8***	23.3***	23.0***	22.1***	23.4***	23.4***	22.0***	26.0***	25.3***	25.8***
Hausman test	11.1**	7.1	11.0**	10.4**	14.1***	6.6	9.1*	3.8	4.1	3.9

Each coefficient indicates the expected change (in percentage points) in U resulting from a one unit increase in the independent variable  
\* Statistically significant at 10% level \*\* at 5% level \*\*\* at 1% level

1 All regressions contain a constant t-statistics in italics

2 Details on each explanatory variable are in Annex A

Note ALMPU = active labour market spending per unemployed UB = the average of different replacement rates EPL = index of the strictness of employment protection legislation UDENS = union density CLWB = index of corporatism CLWB2 = square of CLWB ECOOR UCOOR and COOR = indexes of co-ordination CAP = output gap TRESTR = index of pervasiveness of trade restrictions INTER = the product between TRESTR and the index of exposure to foreign competition TERMS = the terms of trade index IRL = the long-term interest rate TWEDGE = tax wedge index See Annex A for details

Source See Annex A

## Assessing the role of labour market policies and institutional settings on unemployment a cross-country study

Table 2. Estimates of reduced-form youth unemployment rate equations, 1983-1993<sup>1</sup>  
Feasible generalised least-squares

Explanatory variable <sup>2</sup>	Equation version number									
	1	2	3	4	5	6	7	a	9	10
	Estimated coefficients									
<b>ALMPU</b>	<b>-0.05</b>									
	<i>-1.03</i>									
<b>UB3</b>	<b>0.16***</b>	<b>0.15***</b>	<b>0.17***</b>	<b>0.16***</b>	<b>0.16***</b>	<b>0.17***</b>	<b>0.15***</b>	<b>0.18***</b>	<b>0.18***</b>	<b>0.16***</b>
	<i>3.90</i>	<i>3.47</i>	<i>3.64</i>	<i>3.49</i>	<i>3.56</i>	<i>3.65</i>	<i>3.26</i>	<i>3.72</i>	<i>3.62</i>	<i>3.28</i>
<b>EPL</b>	<b>1.57***</b>	<b>2.05***</b>	<b>2.18***</b>	<b>2.04***</b>	<b>2.09***</b>	<b>2.41***</b>	<b>2.02***</b>	<b>1.33***</b>	<b>1.25**</b>	<b>1.41***</b>
	<i>5.76</i>	<i>5.58</i>	<i>5.79</i>	<i>5.56</i>	<i>5.62</i>	<i>5.28</i>	<i>5.58</i>	<i>2.67</i>	<i>2.54</i>	<i>2.83</i>
<b>UDENS</b>	<b>0.20***</b>	<b>0.26***</b>	<b>0.28***</b>	<b>0.26***</b>	<b>0.29***</b>	<b>0.26***</b>	<b>0.26***</b>	<b>0.34</b>	<b>0.33***</b>	<b>0.32***</b>
	<i>3.92</i>	<i>4.75</i>	<i>4.86</i>	<i>4.51</i>	<i>4.86</i>	<i>4.76</i>	<i>4.55</i>	<i>5.17</i>	<i>5.11</i>	<i>4.79</i>
<b>ECOOR</b>	<b>-11.8***</b>									
	<i>-7.20</i>									
<b>UCOOR</b>	<b>0.78</b>									
	<i>0.30</i>									
<b>COOR</b>		<b>-9.21***</b>	<b>-9.26***</b>	<b>-9.13***</b>	<b>-9.46***</b>	<b>-10.65***</b>	<b>-9.20***</b>			
		<i>-7.25</i>	<i>-7.45</i>	<i>-7.21</i>	<i>-7.32</i>	<i>-6.20</i>	<i>-6.85</i>			
<b>CLWB</b>								<b>5.66***</b>	<b>4.20*</b>	<b>4.67**</b>
								<i>3.08</i>	<i>1.65</i>	<i>2.40</i>
<b>CLWB2</b>								<b>-0.16*</b>	<b>-0.09</b>	<b>-0.11</b>
								<i>-1.65</i>	<i>-0.73</i>	<i>-1.07</i>
<b>GAP</b>	<b>-1.16***</b>	<b>-1.13***</b>	<b>-1.11***</b>	<b>-1.12***</b>	<b>-1.12***</b>	<b>-1.14***</b>	<b>-1.13***</b>	<b>-1.12***</b>	<b>-1.12***</b>	<b>-1.11***</b>
	<i>-1.38</i>	<i>-1.351</i>	<i>-1.28</i>	<i>-1.313</i>	<i>-1.336</i>	<i>-1.353</i>	<i>-1.366</i>	<i>-1.319</i>	<i>-1.314</i>	<i>-1.329</i>
<b>TWEDGE</b>			<b>-0.10</b>							
			<i>-1.13</i>							
<b>TERMS</b>				<b>-2.12</b>						
				<i>-0.52</i>						
<b>IRL</b>					<b>-0.22</b>					
					<i>-0.98</i>					
<b>TRESTR</b>						<b>-0.07</b>			<b>0.06</b>	
						<i>-1.27</i>			<i>0.79</i>	
<b>INIER</b>							<b>0.00</b>			<b>0.49</b>
							<i>0.01</i>			<i>1.49</i>
Adj R <sup>2</sup>	0.82	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
SEE	4.06	2.5	2.53	2.54	2.52	2.53	2.54	2.5	2.51	2.49
N of observations	165	165	165	165	165	165	165	165	165	165
N of countries	15	15	15	15	15	15	15	15	15	15
F-test	234.1**	51.5***	48.7***	50.01***	53.27***	47.1***	50.3***	95.4***	89.8***	95.7***
Honda test	8.1***	17.5***	21.03***	9.21***	8.93***	10.4***	9.4***	14.5***	13.8***	14***
Hausman test	<b>18.9***</b>	11.2**	13.2**	12.34**	<b>15.24***</b>	11.2**	<b>16.3***</b>	7.2*	7.2'	9.2'

Each coefficient indicates the expected change (in percentage points) in youth U resulting from a one unit increase in the independent variable

\* Statistically significant at 10% level \*\* at 5% level \*\*\* at 1% level

1 All regressions contain a constant t-statistics in italics

2 Details on each explanatory variable are in Annex A

Note ALMPU = active labour market spending per unemployed UB3 = the average of different replacement rates EPL = index of the strictness of employment protection legislation UDENS = union density CLWB = index of corporatism CLWB2 = square of CLWB ECOOR UCOOR and COOR = indexes of co-ordination GAP = output gap TRESTR = index of pervasiveness of trade restrictions INTER = the product between TRESTR and the index of exposure to foreign competition TERMS = the terms of trade index IRL = the long-term interest rate TWEDGE = tax wedge index See Annex A for details

Source See Annex A

Table 3. Estimates of reduced-form LTU rate equations, 1983-1993<sup>1</sup>  
Feasible generalised least-squares

Explanatory variable <sup>2</sup>	Equation version number									
	1	2	3	4	5	6	7	8	9	10
	Estimated coefficients									
ALMPU	<b>-0.01</b> <i>-045</i>	<b>-0.02</b> <i>-056</i>	<b>-0.03</b> <i>-1.00</i>	<b>-0.02</b> <i>-093</i>	<b>-0.03</b> <i>-1 15</i>	<b>-0.02</b> <i>-108</i>	<b>-0.03</b> <i>-1 19</i>	<b>-0.02</b> <i>-065</i>	<b>-0.02</b> <i>-083</i>	<b>-0.02</b> <i>-088</i>
UB2	<b>0.05***</b> <i>290</i>	<b>0.05***</b> <i>2 74</i>	<b>0.03*</b> <i>192</i>	<b>0.04**</b> <i>202</i>	<b>0.04**</b> <i>2 14</i>	<b>0.03</b> <i>146</i>	<b>0.02</b> <i>109</i>	<b>0.03</b> <i>138</i>	<b>0.02</b> <i>120</i>	<b>0.02</b> <i>078</i>
EPL	<b>0.46***</b> <i>366</i>	<b>0.49***</b> <i>386</i>	<b>0.38***</b> <i>316</i>	<b>0.36***</b> <i>306</i>	<b>0.4***</b> <i>332</i>	<b>0.28**</b> <i>238</i>	<b>0.33***</b> <i>289</i>	<b>0.13</b> <i>095</i>	<b>0.12</b> <i>1.00</i>	<b>0.15</b> <i>124</i>
UDENS	<b>0.06***</b> <i>285</i>	<b>0.07***</b> <i>304</i>	<b>0.05**</b> <i>209</i>	<b>0.04"</b> <i>166</i>	<b>0.06***</b> <i>263</i>	<b>0.05**</b> <i>218</i>	<b>0.03</b> <i>1.50</i>	<b>0.05**</b> <i>200</i>	<b>0.05**</b> <i>212</i>	<b>0.03</b> <i>1.41</i>
ECOOR	<b>-2.93***</b> <i>-2 87</i>									
UCOOR	<b>-1.10</b> <i>-0 84</i>									
COOR		<b>-2.15***</b> <i>-452</i>	<b>-2.14***</b> <i>-49</i>	<b>-2.11***</b> <i>-500</i>	<b>-2.26***</b> <i>-5 10</i>	<b>-1.64***</b> <i>-347</i>	<b>-1.76***</b> <i>-401</i>			
CLWB								<b>2.06***</b> <i>368</i>	<b>1.20*</b> <i>173</i>	<b>1.48***</b> <i>267</i>
CLWB2								<b>-0.08***</b> <i>-287</i>	<b>-0.04</b> <i>-1 22</i>	<b>-0.05'</b> <i>-1 94</i>
GAP	<b>-0.17***</b> <i>-521</i>	<b>-0.17***</b> <i>-5 18</i>	<b>-0.20***</b> <i>-599</i>	<b>-0.19***</b> <i>-582</i>	<b>-0.19***</b> <i>-5 73</i>	<b>-0.19***</b> <i>-589</i>	<b>-0.20***</b> <i>-603</i>	<b>-0.20***</b> <i>-601</i>	<b>-0.19***</b> <i>-589</i>	<b>-0.20***</b> <i>-607</i>
TWEDGE			<b>0.11***</b> <i>399</i>	<b>0.12***</b> <i>419</i>	<b>0.11***</b> <i>387</i>	<b>0.10***</b> <i>350</i>	<b>0.10***</b> <i>365</i>	<b>0.12***</b> <i>418</i>	<b>0.11***</b> <i>36</i>	<b>0.11***</b> <i>387</i>
TERMS				<b>-1.80</b> <i>-1 16</i>						
IRL					<b>-0.15</b> <i>-1 47</i>					
TRESTR						<b>0.03*</b> <i>1 94</i>			<b>0.04*</b> <i>184</i>	
INTER							<b>0.21**</b> <i>2 33</i>			<b>0.23**</b> <i>2 49</i>
Adj R <sup>2</sup>	092	092	092	092	092	092	092	092	092	092
SEE	094	093	09	09	089	09	089	09	091	09
N of observations	177	177	177	177	177	177	177	177	177	177
N of countries	17	17	17	17	17	17	17	17	17	17
F-test	4747***	53.43***	47.15***	43.18***	4891	3771***	40.67***	53.34***	44.76***	43.07***
Hausman test	604'	472'	2.64**	6.9**	5 58*	3 38	3 4	5 6*	6*	7 1

Each coefficient indicates the expected change (in percentage points) in LTU rate resulting from a one unit increase in the independent variable

\* Statistically significant at 10% level \*\* at 5% level \*\*\* at 1% level

<sup>1</sup> All regressions contain a constant t-statistics in italics

<sup>2</sup> Details on each explanatory variable are in Annex A

Note ALMPU = active labour market spending per unemployed UB2 = the average of different replacement rates EPL = index of the strictness of employment protection legislation UDENS = union density CLWB = index of corporatism CLWB2 = square of CLWB ECOOR UCOOR and COOR = indexes of co-ordination GAP = output gap TRESTR = index of pervasiveness of trade restrictions INTER = the product between TRESTR and the index of exposure to foreign competition. TERMS = the terms of trade index IRL = the long-term interest rate TWEDGE = tax wedge index See Annex A for details

Source See Annex A

Table 4 Estimates of reduced-form non-employment rate equations, 1983-1993<sup>1</sup>(Sum of inactive and the unemployed divided by the working age-population in per cent)  
Feasible generalised least-squares

Explanatory variable?	Equation version number									
	1	2	3	4	5	6	7	8	9	10
	Estimated coefficients									
ALMPU	<b>-0.12*</b> <i>-1.65</i>	<b>-0.13*</b> <i>-1.67</i>	<b>-0.12**</b> <i>-1.96</i>	<b>-0.13*</b> <i>-1.74</i>	<b>-0.13*</b> <i>-1.68</i>	<b>-0.12*</b> <i>-1.84</i>	<b>-0.12**</b> <i>-2.24</i>	<b>-0.11</b> <i>-1.35</i>	<b>-0.12*</b> <i>-1.67</i>	<b>-0.11*</b> <i>-1.78</i>
EPL	<b>1.50***</b> <i>3.98</i>	<b>1.52***</b> <i>4.14</i>	<b>1.48***</b> <i>4.78</i>	<b>1.55***</b> <i>4.22</i>	<b>1.53***</b> <i>4.15</i>	<b>1.11***</b> <i>3.34</i>	<b>1.37***</b> <i>5.13</i>	<b>0.79**</b> <i>1.99</i>	<b>0.76**</b> <i>2.22</i>	<b>0.88***</b> <i>2.88</i>
UDENS	<b>0.12***</b> <i>3.19</i>	<b>0.12***</b> <i>3.22</i>	<b>0.11***</b> <i>2.90</i>	<b>0.14***</b> <i>3.54</i>	<b>0.13***</b> <i>3.03</i>	<b>0.11***</b> <i>3.06</i>	<b>0.08</b> <i>2.19</i>	<b>0.12***</b> <i>3.05</i>	<b>0.11***</b> <i>2.95</i>	<b>0.08**</b> <i>2.18</i>
ECOOR	<b>-5.39*</b> <i>-1.75</i>									
UCOOR	<b>-4.24</b> <i>-1.08</i>									
COOR		<b>-4.90***</b> <i>-3.76</i>	<b>-4.89***</b> <i>-4.46</i>	<b>-5.04***</b> <i>-3.85</i>	<b>-4.94***</b> <i>-3.76</i>	<b>-3.20***</b> <i>-2.60</i>	<b>-4.11***</b> <i>-4.26</i>			
CLWB								<b>5.41***</b> <i>3.17</i>	<b>2.19</b> <i>1.13</i>	<b>3.90***</b> <i>2.84</i>
CLWB2								<b>-0.24***</b> <i>-2.75</i>	<b>-0.08</b> <i>-0.85</i>	<b>-0.16**</b> <i>-2.26</i>
GAP	<b>-0.65***</b> <i>-1.280</i>	<b>-0.65***</b> <i>-1.280</i>	<b>-0.66***</b> <i>-1.260</i>	<b>-0.66***</b> <i>-1.300</i>	<b>-0.64***</b> <i>-1.250</i>	<b>-0.65***</b> <i>-1.290</i>	<b>-0.66***</b> <i>-1.320</i>	<b>-0.65***</b> <i>-1.280</i>	<b>-0.65***</b> <i>-1.280</i>	<b>-0.66***</b> <i>-1.310</i>
TWEDGE			<b>0.03</b> <i>0.69</i>							
TERMS				<b>3.64</b> <i>1.44</i>						
IRL					<b>-0.05</b> <i>-0.35</i>					
TRESTR						<b>0.12***</b> <i>2.78</i>			<b>0.14**</b> <i>2.51</i>	
INTER							<b>0.62***</b> <i>3.75</i>			<b>0.60***</b> <i>3.41</i>
Adj R <sup>2</sup>	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
See	152	152	155	151	152	153	153	153	153	154
N of observations	187	187	187	187	187	187	187	187	187	187
N of countries	17	17	17	17	17	17	17	17	17	17
F-test	179***	182.5***	125.8***	184.7***	181.8***	122.1***	95.4***	187.9***	138***	111.1***
Honda test	28.6***	28.6***	26.8***	28.6***	28.6***	27.7***	26.5***	28.5***	27.9***	26.9***
Hausman test	3.4	3.1	10.2**	5.6	3.4	3.2	9.6**	6.4**	4.8'	9.9'''

Each coefficient indicates the expected change (in percentage points) in NE rate resulting from a one unit increase in the independent variable

\* Statistically significant at 10% level \*\* at 5% level \*\*\* at 1% level

1 All regressions contain a constant t-statistics in italics

2 Details on each explanatory variable are in Annex A

Note ALMPU = active labour market spending per unemployed UB = the average of different replacement rates EPL = index of the strictness of employment protection legislation UDENS = union density CLWB = index of corporatism CLWB2 = square of CLWB ECOOR UCOOR and COOR = indexes of co-ordination GAP = output gap TRESTR = index of pervasiveness of trade restrictions INTER = the product between TRESTR and the index of exposure to foreign competition TERMS = the terms of trade index IRL = the long-term interest rate TWEDGE = tax wedge index See Annex A for details

Source See Annex A

Drawing from the results of a detailed diagnostic analysis (Box 1 and Annex C), the estimates are based on a panel which excludes data for Finland 1992-1993, Portugal 1983-1984, Italy 1983 and Spain 1993 which appear to influence significantly the estimated parameters. Moreover, two estimates of the ALMPU coefficients are reported in the text, one including Sweden and the other excluding it from the sample as this country strongly influences the estimated parameters of ALMPU.

#### Box 1. The identification of outliers and influential observations

Even after controlling for unobservable country-specific components, any inferences from the empirical results of models using a small panel data set and including qualitative variables should be made with care. Annex C reports the results of regression diagnostics based on the identification of observations which significantly increase the standard error of the regression and/or affect the estimated coefficients. It is worth mentioning at the outset that, after controlling for country-specific effects, there are only a few observations which significantly affect the regression results.

In particular, data for Finland for the early 1990s increase the standard errors of regressions significantly as the explanatory variables are not able to fully account for the rapid increase in Finnish unemployment rates during that period. Moreover, the diagnostic analysis points to the Portuguese data for 1983 – and to a lesser extent 1984 – as potential outliers. This comes as no surprise since unemployment rates dropped from almost 8 per cent in the early 1980s to 4-5 per cent in the 1985-1993 period in Portugal without any major change in the labour market policy and institutional stance (see Blanchard and Jimeno, 1995). Indeed, the indices summarising the labour market institutional settings in the late 1980s classify Portugal as the country with the most rigid employment protection legislation, with wages prevalently set at the sectoral level and with low employers' and workers' coordination in wage bargaining, all features which should be associated with higher unemployment. One possible explanation for this apparent contradiction is that labour market regulations in Portugal may be poorly enforced with little or no effects on wage and employment determination. The diagnostic checking also reveals that both the 1983 observation for Italy and the 1993 observation for Spain have a significant impact on the standard error of the regressions.

The results reported in Annex C also suggest that the inclusion of Sweden in the panel, albeit not affecting the overall performance of the regression, influences significantly the estimated coefficient for ALMPU. In particular, the exclusion of this country implies a stronger (and statistically significant) negative impact of ALMPU on unemployment. This result is not entirely surprisingly as Sweden has been characterised by both extremely high expenditures for active labour market programmes (four times the OECD average) in the 1983-1993 period and by levels of unemployment which, albeit low, are comparable with those of countries which spent much less on ALMPs.

As shown in Table 1, the estimated impacts of **active labour market programmes (ALMPU)** on the unemployment rate are small and in some cases not statistically significant. These results contrast with previous macro-based studies (Layard *et al.*, 1991, Layard and Nickell 1992) but seem consistent with a number of studies based on micro data, which indicate that active programmes have generally a limited impact on worker employability. However, if Sweden is excluded from the panel, the magnitude and statistical significance of the estimated coefficient for ALMPU increases (the estimated coefficient becomes  $-0.23$  in equation 2 in Table 1).

The coefficients in Table 1 make it possible to shed some light on the potential impact of active programmes on regular (*ie* non subsidised) employment – *e.g.* correcting for the influence of ALMP participants on the measurement of unemployment, on the assumption that participants are not counted as employed. Under the hypothesis of a constant labour force, and assuming an ALMP participation rate ( $p$ ) of 3 per cent of the labour force and a measured unemployment rate ( $u$ ) of 8 per cent, the results of Table 1 imply a derivative of measured unemployment rates with respect to ALMP participation rates of about  $-0.45$  in the panel including Sweden, and  $-1.48$  excluding Sweden. In other words, an increase in the number of ALMP participants of 1 percentage point of the labour force reduces measured unemployment by 0.45 to 1.48 percentage points of the labour force. As a consequence, the effect on the rate of regular employment ( $100 - u - p$ ) is either negative ( $-0.55$  percentage points of the labour force) or positive (0.48 percentage points) but still implying significant substitution effects<sup>32</sup>.

High levels of **unemployment benefits** increase structural unemployment significantly (Table 1). The implicit average elasticity of unemployment to the UB index is close to 0.5. These results suggest that disincentive effects and increased wage pressures dominate those affecting search effectiveness through income support. Reducing benefit entitlements may therefore reduce unemployment via lower reservation wages and higher exits from the unemployment pool.

The estimated results give some support to the hypothesis that stringent **employment protection legislation** contributes to high unemployment and non-employment rates<sup>33</sup>. As such, they are consistent with Lazear (1990) who indicated a negative (albeit weak) association between the unemployment rate and EPL. These results conflict, however, with those of Bertola (1992) who was unable to find any relationship between unemployment levels and employment adjustment costs.

Tables 2 to 4 clearly indicate that employment protection rules have a more significant effect on the structure of employment and unemployment, putting upward pressure on youth and long-term Unemployment. The estimated effects of EPL on unemployment in both the youth unemployment and the LTU equations are larger and more significant than those observed in the total unemployment equations<sup>34</sup>. These results are consistent with an insider-outsider explanation of

LTU and youth unemployment. Higher firing costs may cause firms to change their hiring strategies towards increased “screening” of job applicants. This is likely to work to the detriment of inexperienced workers and the long-term unemployed whose long absence from work may have caused a deterioration of their skills or be interpreted by firms as indicating low expected productivity. However, turnover costs are only a necessary and not a sufficient condition allowing insiders to bid for higher wages at the expense of employment opportunities for outsiders. The way in which wages are bargained may also contribute. Indeed, the sensitivity analysis discussed in Annex C suggests that the explanatory power of the EPL index changes significantly if explicit account is taken of its likely interaction with the wage bargaining system, that is, with union density and the centralisation of co-ordination variables.

There is also evidence in Table 1 (equation 2) that **worker bargaining power** (proxied by union density) may lead to higher Unemployment, unless it is accompanied by a well co-ordinated bargaining process (COOR)<sup>35</sup>. In corporatist countries, **co-ordination among employers** (see equation 1 in Table 1) can significantly reduce structural unemployment insofar as such co-ordination provides a mechanism by which labour market pressures can be internalised into wage formation, increasing the sensitivity of wages to aggregate events. In the alternative specification, **the degree of centralisation/decentralisation of wage bargaining** is also important. The estimated coefficients of both CLWB and its square (equation 8 in Table 1) have the expected signs (although they are not always significantly different from zero). Albeit weak, these results confirm the hump-shaped hypothesis described above, whereby both highly centralised systems and fully decentralised systems help to restrain the wage claims of insiders and thereby contain unemployment.<sup>36</sup> The sensitivity analysis (Annex C) also reveals that there are close interactions between union density, co-ordination and centralisation. The analysis suggests that higher co-ordination seems to be always associated with lower equilibrium unemployment rates, regardless of the level of unionisation. The relative performance of centralised systems depends more importantly on the degree of unionisation. Highly centralised systems seem to be associated with lower unemployment outcomes as long as unionisation is not too high. Decentralised systems are also associated with lower unemployment, although the overall impact is of a smaller scale.

Institutional factors affecting the wage bargaining system are found to have an even stronger impact on youth unemployment, LTU and non-employment (Tables 2-4). In the case of youth unemployment, the results provide further support to the insider-outsider thesis, whereby young workers and new entrants into the labour market are particularly affected by the strong position of insiders (as proxied by UDENS) who may set wages above market-clearing levels. Similarly, high union

density, if accompanied by low co-ordination, may increase the average duration of unemployment (LTU)

It is also noticeable that the **two indices of foreign “competition”** (TRESTR and INTER) in Table 1 generally have a positive sign, as predicted, although the coefficients have large standard errors. Given the expected links between a lack of product market competition, rents, and rent-sharing behaviour, it is not surprising that the LTU and non-employment equations (Tables 3 and 4) suggest that the lack of foreign competition has a significant effect on the most vulnerable job seekers, if not on all the unemployed

Table 1 does not give support to any effect of the **tax wedge** on overall unemployment, in contrast to previous results (Pichelmann and Wagner, 1986; Layard and Nickell, 1986). The use of a marginal tax wedge instead of the average tax wedge does not alter this result noticeably. Despite the negligible effect on overall unemployment, Table 3 reveals that high non-wage labour costs may affect significantly long-term unemployment rates. Since the long-term unemployed are often low-paid workers, this result seems consistent with the idea a high tax wedge may affect their employment prospect, especially in those countries where binding wage floors prevent taxes to shift fully on wages. Further investigation is, however, needed in this area especially to assess the links between binding wage floors (such as minimum wages) and tax wedges.

Finally, there is no evidence in Table 1 that over the 1983-1993 period changes in the **terms of trade** (equation 4) or changes in the **long-term interest rates** (equation 5) have significantly affected labour market conditions

### The persistence of unemployment

Let us now turn to the persistence of unemployment and to its possible determinants. This requires, as stressed in the previous section, the extension of the period of analysis to the 1970s and early 1980s. The first two columns of Table 5 show the degree of persistence in unemployment for 17 OECD countries over the period 1970-1993 for which data are available. They report the probability of accepting the unit-root hypothesis, *i.e.* full hysteresis, against the alternative of a stationary process with a constant (column 1) and with a constant and a trend (column 2). The results point to highly persistent unemployment rates in many OECD countries, although in several cases it is difficult to discriminate between the notion of full hysteresis and that of slow adjustment, as also reported in Elmeskov and MacFarlan (1993)

Recalling equation [9] in the previous section, the actual unemployment rate can be expressed as the sum of the short-term equilibrium rate and a cyclical component. The short-term equilibrium rate is a function of lagged unemployment and those factors affecting the long-run equilibrium unemployment, namely the

Table 5. Unemployment dynamics in OECD countries, 1970-1993

	Probability of unit root <sup>1</sup> against a stationary process with		Regression results					
	Constant	Constante and drift	Standard errors of regressions			Persistence ( $\lambda$ )		
			Equation 11	Equation 12	AR(1) model with constant and drift <sup>3</sup>	Equation 11	Equation 12	AR(1) model with constant and drift <sup>3</sup>
United States	0.21	0.12	0.53	0.51	1.00	0.64	0.63	0.63
Japan	0.60	0.53	0.50	0.51	0.19	0.64	0.73	0.82
Germany	0.51	0.05	0.47	0.48	0.72	0.84	0.84	0.86
France	0.97	0.34	0.42	0.43	0.56	0.79	0.85	0.83
Italy	0.99	0.02	0.50	0.52	0.51	0.90	0.88	0.65
United Kingdom	0.69	0.37	0.57	0.57	1.15	0.77	0.77	0.86
Canada	0.69	0.12	0.64	0.59	1.04	0.74	0.79	0.71
Australia	0.87	0.14	0.59	0.61	1.02	0.73	0.77	0.63
Belgium	0.89	0.22	0.79	0.77	0.90	0.90	0.89	0.94
Denmark	1.00	0.38	0.61	0.60	0.96	0.72	0.73	0.78
Finland	0.85	0.01	1.36	1.36	1.70	0.80	0.81	1.17
Ireland	0.56	0.20	0.91	0.94	1.22	0.79	0.79	0.82
Netherlands	1.00	0.29	0.56	0.57	0.90	0.81	0.82	0.91
Norway	0.87	0.20	0.36	0.35	0.55	0.75	0.67	0.79
Portugal <sup>2</sup>	0.35	—	0.92	0.92	0.94	0.87	0.89	0.90
Spain	0.93	0.01	1.19	1.20	1.53	0.87	0.87	0.87
Sweden	0.79	0.01	0.80	0.83	0.74	0.77	0.72	0.52

1 Probability of unit root against hypotheses of a stationary process with constant (column 1) or constant and time trend (column 2). The unit root test is based on augmented Dickey-Fuller test using the following specifications: Column 1  $du_t = C_0 + C_1 u_{t-1} + C_2 du_{t-1} + e_t$ ; Column 2  $du_t = C_0 + C_1 u_{t-1} + C_2 du_{t-1} + C_3 \text{Time} + e_t$ , where  $u$  is the unemployment rate and  $d$  is the first difference operator. See Campbell and Perron (1991).

2 Higher probability of unit root using a model with constant and drift.

3 The model has the form  $du_t = A + B_1 u_{t-1} + B_2 \text{Time}$ .

Source: See Annex A.

policy and institutional factors – as well as the real interest rates and the terms of trade – considered in the previous section. Furthermore, the coefficient for lagged unemployment ( $h$ ) can be expressed as a function of labour market policy and institutional factors – namely the UB index, the EPL index and the wage-setting variables<sup>37</sup> As for the static specification, two alternative equations are considered, one where union density is complemented by the co-ordination index and another where union density is complemented by the index of centralisation of wage bargaining and its square Equation [9] can therefore be specified as follows

$$u_{it} = \mu_i + \left[ \begin{array}{l} \alpha_0 + \beta_1 UB_{it-1} + \beta_2 EPL_i + \beta_3 UDENS_{it-1} + \\ \beta_4 (COOR_i, \text{ or, } CLWB_i \text{ and } CLWB2_i) \end{array} \right] u_{it-1} + \beta_5 UB_{it} + \beta_6 UDENS_{it} + \beta_7 IRL_t + \beta_8 TERMS_{it} + \beta_9 GAP_{it} + v_{it} \quad [10]$$

where  $i$  indices countries and  $t$  the years,  $\mu_i$  is the country-specific constant and the other acronyms have the same meaning as above

Using non-linear Seemingly Unrelated Regression (SUR) estimators, equation [10] with the co-ordination index yields

$$u_{it} = \mu_i + \left[ \begin{array}{l} -0.69 \quad +0.002UB_{it-1} \quad +0.021EPL_i \quad +0.002UDENS_{it-1} \quad -0.045COOR_i \\ (1934) \quad (4.74) \quad (9.56) \quad (3.56) \quad (-8.66) \\ +0.01UB_{it} \quad +0.01UDENS_{it} \quad +0.07IRL_{it} \quad -0.27TERMS_{it} \quad -0.32GAP_{it} \\ (5.73) \quad (2.12) \quad (9.70) \quad (-15.43) \quad (-32.52) \end{array} \right] u_{it-1} + \quad [11]$$

$\mu_i$  = country dummy, No of observations = 391, t-statistics are in parentheses and are computed from heteroscedastic-consistent standard errors

Alternatively, using the indices of centralisation of wage bargaining

$$u_{it} = \mu_i + \left[ \begin{array}{l} -0.36 \quad +0.001UB_{it-1} \quad +0.0012EPL_i \quad +0.001UDENS_{it-1} \quad +0.061CLWB_i \quad -0.003CLWB2_i \\ (6.86) \quad (2.79) \quad (6.40) \quad (1.88) \quad (8.37) \quad (-7.31) \\ +0.02UB_{it} \quad +0.02UDENS_{it} \quad +0.81IRL_{it} \quad -0.24TERMS_{it} \quad -0.32GAP_{it} \\ (8.15) \quad (3.74) \quad (10.12) \quad (-13.33) \quad (-32.47) \end{array} \right] u_{it-1} + \quad [12]$$

$\mu_i$  = country dummy, No of observations = 391, t-statistics are in parentheses and are computed from heteroscedastic-consistent standard errors

Despite their simplicity, the two versions of equation [10] explain a significant fraction of the variation in unemployment rates over a 24-year period. All coefficients are correctly signed and generally significantly different from zero. To assess the quality of these estimates, the third and fourth columns of Table 5 compare the regression standard error for each country based on equations [11] and [12] with those from a simple autoregressive model with constant and drift estimated for each country in isolation. The two cross-country structural equations outperform the autoregressive model in 13 cases and only in two cases (Japan and Sweden) does the AR model clearly offer better results. The last three columns of Table 5 report the estimated degree of persistence which is particularly high in several European countries, e.g. Belgium, Italy, Portugal, Spain and Germany

These results complement those from the static analysis. In addition to affecting equilibrium unemployment, generous unemployment benefits reduce the adjustment speed, which is in line with the observed effect on the duration of unemployment spells, as shown in the LTU equations above. Consistent with the insider-outsider hypothesis, strict employment protection legislation as well as high unionisation seem to increase the persistence of unemployment, presumably by raising real wage rigidity. Moreover, the adjustment speed is increased by a higher degree of co-ordination/centralisation in the wage bargaining process. In addition, the parameters for the degree of centralisation of wage bargaining provide further support to the hump-shaped hypothesis. Both highly centralised or decentralised systems significantly increase the adjustment speed, suggestive of reduced real wage rigidity containing the build up of persistent unemployment. There is also some evidence that both the increase in real interest rates<sup>38</sup> during the 1980s and the deterioration of the terms of trade in the aftermath of the two oil shocks served to raise structural unemployment.

#### **Accounting for the differences in level and evolution of structural unemployment**

Table 6 summarises the results presented in the previous two subsections. Panel A breaks down the difference between each country's structural unemployment rate and the OECD average into its constituent parts, namely differences in ALMPU, unemployment benefits and institutional settings plus a residual which accounts for unobserved country-specific factors. The parameters referring to institutional factors include the joint impact of wage bargaining setting and employment protection regulations on unemployment without attempting a further breakdown given the close interactions among these factors. The results confirm that differences in the ALMPU stance explain only a small proportion of unemployment differentials, while a marked role is played by the different generosity of the unemployment benefits. In particular, in countries like Denmark, Belgium, the Netherlands and France, the UB system may explain as much as 3 to 5 percentage points of the unemployment rate differential. In some European countries, high unionisation combined with a lack of co-ordination in the wage bargaining process and stringent employment protection legislation contribute to explain their high unemployment rates. These latter results should, however, be evaluated carefully as these variables are defined on the basis of subjective evaluations and do not represent precise estimates of the magnitude of these effects.

The estimated country-specific effects – or unexplained residuals – are presented in the last column of Panel A.<sup>39</sup> A positive value means that the included explanatory variables would predict a lower-than-observed unemployment rate, and that other missing variables are needed to explain the remaining unemployment. Along the same lines, a negative estimated value implies that unobserved factors

Table 6. Accounting for the level and rise in structural unemployment

	A Structural unemployment - 1983-1993 (equation 2 in Table 1)					B Rise in structural unemployment (1971-1993) equation 11						
	Estimated structural unemployment rate ( $u_i$ ) <sup>1</sup>	Difference $u_i - u_{OECD}$	explaining the difference ( $u_i - u_{OECD}$ )			Country-specific effect	Observed change in $u_i$	explaining the change in structural unemployment ( $\Delta u_i$ )				
		ALMPU <sup>3</sup>	UB	Institutional factors <sup>2</sup>			UB	Union density	Interest rate	Terms of trade	Country-specific effect	
United States	6.7	-0.5	0.3	-1.3	0.7	-0.2	1.1	-0.3	-0.6	0.8	0.6	0.6
Japan	2.6	-4.5	0.2	-1.6	-3.2	0.1	0.8	-0.2	-0.4	0.8	0.2	0.5
West Germany	5.9	-1.3	-0.6	2.7	-2.5	-0.9	4.6	0.3	0.1	1.7	0.2	2.3
France	9.8	2.7	-0.1	3.0	-2.7	2.4	7.7	1.9	0.1	1.9	0.6	3.1
Italy	8.5	1.3	0.0	-2.8	5.3	-1.2	4.2	0.5	0.7	2.5	1.0	-0.6
United Kingdom	9.9	2.8	0.0	0.2	4.0	-1.4	4.8	-1.8	-1.5	1.4	0.9	5.8
Canada	9.7	2.5	0.1	1.2	3.2	-2.0	4.4	0.8	0.8	1.8	0	1.0
Australia	8.5	1.3	0.2	0.9	1.3	-1.0	7.6	1.0	0	1.7	1.6	3.3
Belgium	9.7	2.5	-0.3	3.6	2.0	-2.8	6.4	1.9	2.1	3.1	-0.2	-0.4
Denmark	9.7	2.6	-0.3	5.6	-4.8	2.0	9.3	1.5	1.5	1.4	0.5	4.4
Finland	5.7	-1.4	-0.7	2.3	-2.1	-0.9	11.0	3.9	3.3	1.8	-0.1	2.0
Ireland	15.4	8.3	-0.2	1.8	5.2	1.5	9.7	4.9	2.7	1.8	0.2	0.1
Netherlands	9.1	1.9	-0.4	4.5	-1.8	-0.4	5.3	0.8	-0.4	2.0	0	2.9
Norway	3.9	-3.2	-0.7	2.2	-4.0	-0.7	4.2	2.4	0.7	1.5	-0.1	-0.3
Portugal	6	-1.1	-0.3	1.3	1.2	-3.3	2.2	3.6	-1.4	3.1	0.7	-3.7
Spain	18.6	11.5	0.3	2.6	1.3	7.3	15.4	6.1	1.7	2.1	0.6	5.0
Sweden	3.1	-4.0	<sup>4</sup>	1.3	-1.8	<sup>4</sup>	3.7	1.1	1.00	1.3	0.1	0.1
OECD-17 <sup>5</sup>	7.1						3.6	0.68	-0.23	1.3	0.4	1.5

1 Actual unemployment minus the cyclical component estimated from the coefficient of the output gap

2 Union density (UDENS) the degree of co-ordination (COOR) and the index of employment protection legislation (EPI)

3 Based on the estimated coefficients of the equation including Sweden

4 The contribution of ALMPU on the unemployment differential cannot be assessed as Sweden is an outlier in terms of spending for active programme per unemployed person

5 Labour force weighted averages

Source: See Annex A

contribute to lower the true unemployment rate. It should be stressed that, overall, only a small portion of the cross-country unemployment rate differentials is left unexplained, the major exceptions being Spain and Portugal where unobserved components account for 40-50 per cent of the total unemployment rates. Other European economies such as Belgium, France and Denmark also have relatively large unexplained residuals. In the first case, the model predicted unemployment rates higher than those observed, while in the case of France and Denmark the omitted factors seem to raise unemployment above the predictions of the model. The positive country-specific effects of Spain and France can partly be explained by the underestimation of the role of unions in wage bargaining. In both countries union density is very low, yet collective bargaining coverage rates are very high (70 to 90 per cent, respectively) and, in the case of France, they have been growing during the past two decades. Moreover, in these two countries, and particularly in France, the effects of binding minimum wage regulations – not considered in this paper – may also account for part of the unexplained residuals.

Panel B on the right-hand side of Table 6 gives a breakdown of the rise in structural unemployment from 1971 to 1993 into its constituent parts. For each country, the estimated parameters of equation [11] and the actual values of the exogenous variables were used to compute the changes in unemployment that we would expect from the changes in each of the explanatory variables.<sup>40</sup> Hence, Panel B presents Spain, Ireland and Denmark as the economies with the highest increases in structural unemployment, while only negligible increases occurred in Japan and the United States. The rise in UB generosity explains a great deal of the increases in structural unemployment, especially in Spain and Ireland. High UB replacement rates have a direct impact on unemployment, as shown in the static analysis, and also a severe impact on the speed of labour market adjustment. Falling unionisation rates in many countries lowered unemployment, but the overall effect has been generally limited. Higher real interest rates contributed between 1 and 3 percentage points to the increase in structural unemployment, with particularly severe effects in countries such as Portugal, Belgium, Italy and Spain with powerful persistence mechanisms. Moreover, the deterioration of the terms of trade affected unemployment only to a limited extent, the main exception being Australia where it accounted for 1.6 percentage point increase in unemployment. As before, country-specific effects are significant, particularly in some European economies where other omitted factors contributed to push up unemployment above the levels predicted by the model. For these latter countries further work is needed to explain the rise in structural unemployment over the past two decades.

## CONCLUDING REMARKS

This paper has offered a number of explanations for the differences in labour market performance across OECD countries over the past two decades. In particular,

it has estimated the relative importance of various labour market policy and institutional factors on both the level and dynamic behaviour of unemployment. It will always remain impossible to measure and model, in an entirely satisfactory manner, the wide variety of institutional, cultural and historical factors that influence labour market performances. In this paper, unexplained differences and country-specific measurement errors are identified through a country-specific error term, making the estimated impact of *observable* variables on unemployment more accurate and thus offering a better guidance for the assessment of policy reform.

The main conclusions of this paper can be summarised as follows:

- High levels of **unemployment benefit entitlements** are likely to lead to higher levels of unemployment and reduce the speed of labour market adjustment after an exogenous shock. The rise in the replacement rates over the past two decades in several OECD countries is estimated to have accounted on average for 1 to 3 percentage points increase in structural unemployment, although in some cases the effect has been greater.
- **Strict employment protection regulations** are likely to raise equilibrium unemployment rates significantly, they appear to have stronger positive effects on youth and long-term unemployment. Likewise, the dynamic analysis points to a significant positive impact of these regulations on the persistence of unemployment.
- The impact of different systems of wage determination on labour market performance is more difficult to assess, not least because of the complexity of the interactions among the different components of each system, and difficulties in measuring them precisely. As previous studies have shown, worker bargaining power – proxied by **union density** – seems to be associated with higher unemployment, although the relationship is often weak. Reinforcing the notion that youth unemployed are often “outsiders”, union density seems to have a particularly strong impact on youth unemployment.
- However, union density *per se* offers a very incomplete picture of the wage bargaining system. The **co-ordination** among the social partners at the different levels of the bargaining process as well as the level at which wages are negotiated (centralisation/decentralisation) should also be taken into account. In particular, co-ordination among employers seems to reduce unemployment levels and increase employment insofar as it offers a mechanism by which labour market pressures are internalised into wage formation, increasing the sensitivity of real wages to unemployment. The estimated effects of different degrees of **centralisation of wage bargaining** on unemployment are less clear-cut. Both highly centralised and decentralised bargaining systems appear to outperform intermediate, semi-centralised bargaining systems. These results confirm previous studies and support the idea

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that the worst possible organisation of bargaining systems is the “*in-between*” solution of semi-sectoral or sectoral wage bargains where unions compete with each other without internalising the economy-wide costs of higher wages and higher unemployment

- **Active labour market programmes (ALMPs)** appear to have a negative impact on unemployment. However, the evidence suggests that increases in spending on ALMPs do not translate into equi-proportional falls in unemployment since the programmes give rise to large substitution and displacement effects on employment. The empirical findings also suggest a robust correlation between ALMPs and non-employment rates, confirming that these policies could have a positive effect of labour force participation, keeping otherwise discouraged workers in the labour force

## NOTES

1. Here and in the rest of this paper, we refer to EU-12 and data for Germany refer to Western-Germany.
2. The non-employment rate is the sum of unemployed workers and inactive divided by the total working age population.
3. For simplicity, the impact of unemployment on (log) wages is assumed to be linear in [2]. As often stressed, however, the relationship may be concave insofar as the downward pressure of unemployment on real wages may be decreasing at the margin as unemployment rises.
4. For simplicity, in this example we have assumed that the factors which shifted the **WS** and **LD** schedules did not influence either wage flexibility ( $\gamma_1$ ) or the elasticity of labour demand ( $a$ ). Relaxing these assumptions implies that changes in these factors will **not** only shift the **WS** and **LD** schedules but also affect their slopes. Moreover, if participation decisions are also affected, the full-employment schedule (**LS**) will also shift, thereby affecting the measured level of structural unemployment.
5. As stressed below, several variables proxying policy and institutional factors are not available on a time-series basis but only on a cross-sectional basis (see Annex A).
6. The direct extension of the static equation [8] to account for lagged unemployment effects is not suitable for empirical analysis. The use of OLS would yield biased results in the presence of country-specific effects  $\mu_i$  (Hsiao, 1986). The common methods of either using dummy variables (as pursued in this paper), or taking first-differences (Nickell, 1981; Anderson and Hsiao, 1981) make it impossible to include time-invariant variables ( $\mathbf{z}_i$ ) to account for cross-country differences in  $u_i^*$ .
7. The assumption of an identical parameter for the **GAP** variable across all cross-sectional units does not affect significantly the estimated coefficients for the other explanatory variables. An alternative equation with country-specific coefficients for the **GAP** variable produced similar results.
8. The use of a different measure of the **GAP** based on “potential” output (see Giorno et al., 1995) did not significantly affect the estimates of the coefficients of the other explanatory variables.
9. Calmfors and Lang (1995) offer an analytical framework for analysing the macroeconomic effects of active programmes.

10. Heylen (1993) found that increased expenditures for active labour market programmes per unemployed person (as well as a larger share of active spending in total spending) tended to increase the wage responsiveness to changes in open unemployment.
11. A similar approach was also used by Zetterberg (1993) who considered the share of active measures in total labour market expenditures; and by Heylen (1991) who used active expenditures (in purchasing power dollar values) per unemployed.
12. This would occur if active programmes are more effective when unemployment is higher than when it is low, because the risk of raising insiders' strength in wage bargaining is reduced and the possibility of improving the matching process is enhanced (Calmfors, 1994).
13. If active expenditures increase less than proportionally with unemployment, as often observed, the use of per-unemployed measures leads to simultaneity bias that tends to overestimate the impact of ALMP on unemployment. However, no alternative proxy of the active policy stance seems capable of dealing satisfactorily with this problem. For example, the use of a ratio of total spending on ALMP over the labour force (or the wage bill), as in OECD (1993), is likely to lead to simultaneity bias in the opposite direction, as total expenditures *do* increase – albeit less than proportionally – with unemployment. A different strategy would be to use instrumental variables (IV). However, it is generally difficult to find suitable instruments for ALMPU. An attempt was made using total government spending as the instrument for ALMPU, but the approach was not pursued because of the very limited power of the instrument in explaining variations in ALMPU. See also Jackman (1995) and Calmfors and Skedinger (1995).
14. Over the period from mid-1980s to 1993, the correlation between the rate of inflow into active programmes and the unemployment rate was positive in France (0.76), Canada (0.75), Australia (0.66), Denmark (0.93), Ireland (0.73) and Sweden (0.98) and negative only in Germany (–0.70) and the Netherlands (–0.18).
15. At the macro level, studies by Bean (1989), Layard *et al.* (1991) and Layard and Nickell (1992) found a positive association between unemployment and the UB replacement ratio (Bean) on the one hand, and the duration of benefits (Layard and Nickell; Layard *et al.*) on the other. At the micro level there is an extensive literature which mainly points to a significant effect of benefits on unemployment duration; some of the most recent references are reported in OECD (1994b, Chapter 8). Pedersen and Westergård-Nielsen (1993) also offer a comprehensive survey.
16. There are at least four key features of any given unemployment benefit system which may have effects on aggregate unemployment and its structural components: *i*) the replacement rates of both “insurance-based” benefits (if available) and social assistance benefits; *ii*) the maximum duration of both types of benefits; *iii*) the linkages between unemployment benefits and other income support schemes; and finally *iv*) the eligibility conditions and screening procedures for obtaining the benefits. For example, Layard *et al.* (1991) suggest that the fall in British unemployment after 1986 could be partially due to the stricter conditions introduced in the benefit scheme in that year (see Chapter I). By the same token, Abbring *et al.* (1995) found that in the Netherlands transition rates from unemployment to employment were significantly raised by the imposition of

sanctions eg. benefit reductions designed to make the recipient comply with certain rules on search behaviour.

17. The index takes into account three family situations – single worker, married worker with spouse at work and with spouse not at work. However, it does not consider the presence of children in the household nor does it consider housing benefits.
18. The rationale for using U63 in the youth equations is that the duration of unemployment insurance benefits is often related to the previous work experience and many young unemployed workers may not qualify for benefits over the maximum duration.
19. Employment protection regulations include rules governing unfair dismissals, lay-offs for economic reasons, severance payments, minimum notice periods and administrative authorisation for no-fault dismissals.
20. As stressed by Grubb and Wells (1993), all such surveys may offer results which are sensitive to details of wording and interview methods used. See Section IV in their study where several examples of changes in the perception of the strictness of EPL were found even in the context of unchanged regulations.
21. Among others, see Tyrvainen (1995) for empirical simulations of the effects of tax increases under alternative assumptions about the degree of competition in labour markets.
22. However, the hump-shaped hypothesis has also been criticised. In particular, Soskice (1990) claims that Japan and Switzerland were wrongly classified as decentralised by Calmfors and Driffill, ignoring the role of powerfully co-ordinated employer organisations and networks in these countries. If these two countries are re-classified as centralised, Soskice demonstrated – on the basis of only 11 countries – that unemployment will be a monotonic decreasing function of centralisation.
23. In a cross-country study, Rowthorn (1992) confirmed the hump-shaped association between centralisation and unemployment for the 1980s but not for the 1970s. See also Calmfors (1993) for an up-to-date survey of the studies in this field.
24. The collective bargaining coverage rate (the number of workers covered by the terms of collective agreements) is not included because of lack of data for the 1970s and also because of its high correlation with the centralisation index. Evidence suggests, in fact, that the coverage rate is often lower in countries characterised by single-employer bargaining compared with those where wage agreements are set at the sectoral or nation-wide level. See OECD (1994a), Chapter 5.
25. The choice of the world real interest rate instead of the domestic rates is also justified by the difficulty in interpreting the very low (or negative) domestic rates prevailing in the 1970s in some OECD countries without considering the concomitant distortions in their capital markets.
26. See for instance, Bruno and Sachs (1985); and Layard and Nickell (1986).
27. The full set of 17 countries includes: United States, Japan, Western Germany, France, Italy, United Kingdom, Canada, Australia, Belgium, Denmark, Finland, Ireland, Netherlands, Norway, Portugal, Spain, and Sweden. In the youth unemployment equations, the panel does not include Belgium and Denmark for which data are not available.

28. In the presence of country-specific effects, OLS estimates are biased and the direction of the bias cannot be identified *a priori*.
29. Error-component models assume that the effects of omitted variables reflect individual time-invariant differences. These effects are treated as random variables, in line with the assumption on other components of the random disturbance term ( $v_{it}$ ). In this context, the overall error term could be written as:

$$\varepsilon_{it} = \mu_i + v_{it}$$

The error-components model offers unbiased and efficient (with respect to fixed-effect) estimators under the assumption that the unobservable elements of the individual component  $\mu_i$  are not correlated with the observable regressors included in the model. The Hausman (1978) test has the null hypothesis that  $E(\mu_i | X_i, Z_i) = 0$  against  $E(\mu_i | X_i, Z_i) \neq 0$ . Under the null hypothesis, Hausman's test statistic is distributed asymptotically as a central chi-square with  $P$  degrees of freedom, where  $P$  is the number of time-varying regressors. Hausman notes that, under  $H_0$ , the GLS achieves the Cramer-Rao lower bounds, but under  $H_1$  the GLS estimators are inconsistent and the fixed-effects estimators should be used instead. See also Arellano (1993) for the treatment of correlation of unobservable individual effects with right-hand-side variables.

30. Details about the statistical information used and data sources are in Annex A.
31. Since the estimated statistics were not too far from the 1 per cent limit, the FGLS estimators were still used because the alternative of using country dummies or *within-group* estimators did not permit to estimate the coefficients of time-invariant explanatory variables. However, since there is a (weak) indication of a possible misspecification, these results should be evaluated with care.
32. Equation [2] in Table I yields  $u = -0.05 \text{ ALMPU} + \text{other explanatory variables}$  or, alternatively,  $u = -0.23 \text{ ALMPU} + \text{other explanatory variables}$ , if Sweden is excluded from the sample. The ALMPU variable can also be written as  $(E_p \cdot p) / (u \cdot y)$ , where  $E_p$  = expenditures per participant;  $p$  = programme participants relative to labour force (in per cent);  $u$  = unemployment rate (in per cent); and  $y$  = GDP per capita. if  $u = 8$ , ALMPU = 22 per cent (or 13 per cent without Sweden) and assuming that  $p = 3$ , expenditure per participant as a share of GDP per capita is  $E_p / y = 58$  per cent (or 34 per cent excluding Sweden). Under the additional assumption that all ALMP participants are in the labour force, the implicit differentiation would yield  $du/dp \cong -0.45$  (or  $\cong -1.48$  without Sweden). Assuming that the labour force is constant and defining  $n$  as the regular employment rate ( $n = 100 - u - p$ ), then  $dn/dp = d(100 - u - p)/dp \cong -0.55$  (or  $\cong 0.48$  without Sweden). See also Calmfors (1994) for similar calculations using the results of Layard. *et al.* (1991) and those of Zetterberg (1993).
33. A negative correlation between the employment/population ratio and indices of the "strictness" of EPL is also confirmed in Chapter 6 of the *Jobs Study* (Table 6.9) and, on a more qualitative basis, in a survey by the EC Commission. This latter survey reports that in countries which have relatively strict employment protection (e.g. Italy and Spain), more than half of the firms surveyed reported hiring and firing costs as one of the reasons for not hiring more workers. See EC *Ad Hoc* Survey: Commission of the European Communities, European Economy, No. 47, March 1991.

34. The results for LTU confirm previous findings by Heylen (1991) and **OECD** (1993, Chapter 3).
35. Similar results were obtained by Layard and Nickell (1992) and Layard *et al.* (1991).
36. The estimated coefficients suggest a peak at a CLWB value of 12, which corresponds to the United Kingdom. For Italy, Japan, the United States and Canada, increased decentralisation would lower unemployment, whilst for the other countries increased centralisation would reduce unemployment.
37. ALMPU has not been included because of lack of data for the 1970s and early 1980s.
38. It should be stressed, however, that the real interest rate variable is likely to play the role of a shift variable in equations [11] and [12], as it was very low in the 1970s and significantly higher in the 1980s, when structural unemployment was also higher. Therefore, the estimated positive impact of interest rates on unemployment may be partially spurious as it may simply reflect a change in regime which depends upon other omitted factors such as e.g. productivity growth.
39. The country-specific effects ( $\mu_i$ ) can be derived as follows:

$$\hat{\mu}_i = \left( \frac{\sigma_{\mu}^2}{\sigma_{\varepsilon}^2} \right) j'_{\tau} (y_i - X'_i \hat{\beta} - Z'_i \hat{\gamma})$$

where  $j'_{\tau} = (1, 1, \dots, 1)$ ;  $\sigma_{\mu}^2$  is the variance of  $\mu$ , and  $\sigma_{\varepsilon}^2 = T\sigma_{\mu}^2 + \sigma_v^2$ ;  $\mu$  is the random country-specific effect and  $v$  is the usual error term.

40. Equation [11] was simulated dynamically over the entire period, with each exogenous variable in turns taking its actual value while the others were kept constant. The 1970 initial condition for each country's unemployment rate was set equal to the long-run steady state equilibrium rates, as derived from the parameters of equation 11 and the observed values of the exogenous variables in 1970.

## Annex A

**DESCRIPTION OF THE VARIABLES**

Descriptive statistics of the variables used in this paper are included in Table A.1. The text below presents the methods used to derive the variables and information on the data sources.

Table A 1 **Characteristics of the annual data of the OECD countries**

Variables	(average values for the 1983-1993 period)				(average values for the 1970-1993 period)			
	Mean	Standard deviation	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum
UNST	8.41	4.81	1.46	22.40	6.01	4.07	0.03	22.39
NER	35.60	9.92	18.25	56.51				
YUR	16.55	10.43	3.20	43.80				
LTU	3.50	3.24	0.08	12.52				
ALMPU	22.00	26.46	5.13	107.29				
UB	31.45	15.01	0.75	60.91	31.10	16.20	0.77	69.60
UB2	19.00	13.00	0.00	47.00				
UB3	55.00	24.00	2.30	93.00				
EPL	7.14	4.45	0.36	14.25	7.14	4.45	0.36	14.25
UDENS	38.23	20.82	8.24	83.36	43.53	17.73	8.24	83.36
ECOOR	1.81	0.86	1.00	3.00	1.81	0.86	1.00	3.00
UCOOR	1.90	0.73	1.00	3.00	1.90	0.73	1.00	3.00
COOR	3.71	1.52	2.00	6.00	3.71	1.52	2.00	6.00
CLWB	10.14	4.74	2.00	17.00	10.14	4.74	2.00	17.00
GAP	-0.01	2.10	-4.88	7.07	0.13	2.00	-6.23	7.07
TWEDGE	41.05	10.72	16.32	59.07				
COMP	5.64	2.83	1.37	14.27	5.30	2.66	1.22	2.74
TRESTR	0.94	0.35	0.37	1.62				
INTER	0.45	0.25	0.09	1.07				
IRL	5.11	0.87	3.43	6.76	3.10	2.59	-0.76	6.76
TERMS	5.25	2.63	1.32	11.84	5.29	2.65	1.22	2.74

Source: See text in Annex A

**UNST** = For all but Denmark, standardised unemployment rates are from Labour Force Surveys (LFS). Since LFS data were not available for the 1970s, the unemployment rates for Denmark refer to registered unemployed and are from the OECD Economic Outlook (various issues). The unemployment rates have been adjusted in order to reduce the number of breaks in the series for the different countries.

*Source:* OECD, Directorate for Education, Employment, Labour and Social Affairs (DEELSA).

**YUR** = Youth unemployment rate; individuals from 15/16 to 24 years of age. Data are from Labour Force Surveys.

*Source:* OECD-DEELSA

**LTU** = Long-term unemployment rate; individuals with unemployment spell longer than 12 months to the labour force. Data are from Labour Force Surveys.

*Source:* OECD-DEELSA.

**NER** = Non-employment rates. The share of the working-age population which is either unemployed or inactive.

*Source:* OECD-DEELSA

**GAP** = output gap;

$$\text{GAP} = \left( \frac{A_o}{T_o} - 1 \right) * 100$$

where:

A<sub>o</sub> = actual output; see OECD ADB database

T<sub>o</sub> = trend output. It is based on a GDP smoothing approach using an Hodrick-Prescott Filter. A value of  $\lambda = 25$  was used for most of the countries. See Giorno *et al.* (1995) for more details

*Source:* OECD Analytical Database (ADB).

**ALMPU** = expenditures for active labour market programmes per unemployed person relative to GDP per capita (in per cent);

$$\text{ALMPU} = \frac{\frac{\text{ALMPex}}{U}}{\frac{\text{GDP}}{\text{Pop}}}$$

ALMPex = expenditures on active labour market programmes (see *OECD Employment Outlook - 1993*, Annex 2.B, for details).

Pop = working age population

U = total registered unemployed

*Source*; OECD, *Employment Outlook*, various issues and OECD ADB.

**UB** = the average of the unemployment benefit replacement rates for two earnings levels, three family situations and three duration categories of unemployment. Information on replacement rates in the OECD database is only available for odd-numbered years. Even-numbered years were calculated using linear interpolation. After-tax replacement rates were obtained from the OECD *lobs Study* (Annex 8.B) interpolating the ratios (net/gross rates) for 1971, 1981, 1991. After-tax replacement rates for 1992 and 1993 were calculated using the 1991 ratios (net/gross rates)

*Source*: OECD *Database on Unemployment Benefit Entitlements and Replacement Rates*; and OECD *lobs Study*, Annex 8.B.

**UB2** = as UB but including only replacement rates for spells longer than one year.

**UB3** = as UB but including only replacement rates for the first year of unemployment.

**EPL** = index of the "strictness" of employment protection legislation. The index is the average of two rankings for regular and fixed-term contract workers, respectively. The index refers to 1989.

*Source*: OECD (1994), *The OECD lobs Study*, Table 4.7, second column.

**ECOOR** = extent of inter-firm co-ordination in the process of wage bargaining. The index varies from 1 to 3, with 3 referring to maximum co-ordination, both here and in UCOOR.

*Source*: Layard *et al.* (1991), Chapter 1

**UCOOR** = extent of inter-union co-ordination in the process of wage bargaining. It is also graded from 1 to 3.

*Source*: see ECOOR.

**COOR** = ECOOR + UCOOR

**CLWB** = ranking of the degree of centralisation of wage bargains. The lower the position in the ranking, the higher is the degree of centralisation.

*Source:* Calmfors and Driffill (1988), Table 11.

**UDENS** = the proportion of workers who are members of trade unions. Available observations refer to 1970, 1980 and 1990 (see footnote to Table 5.7 of the OECD *Employment Outlook – 1994* for country details). Missing observations were calculated by a linear interpolation.

*Source:* OECD *Employment Outlook – 1994*, Chapter 5, Paris.

**TWEDGE** = the ratio between the total value of employers' social security contributions, employees' social security contributions and personal income tax plus the amount of consumption tax typically paid if all post-tax income is consumed and gross earnings plus employers' social security contributions

*Source:* OECD (1995), *The Tax/Benefit Position of Production Workers*, Paris; Tyrvaïnen (1996).

**COMP** = index of exposure to foreign competition:

$$\text{COMP} = X_i + (1 - X_i) \text{MP}$$

where:

$X_i$  = index of export intensity (ratio of exports to GDP);

MP = index of import penetration (ratio of imports to apparent consumption, that is, domestic production minus exports plus imports).

*Source:* OECD (1995a), The OECD ADB.

**TRESTR** = the index of pervasiveness of trade restrictions reported in Table B.1 in Annex B.

**INTER** =  $(\text{COMP} * \text{TRESTR})/100$

**IRL** = GDP-weighted average of real long-term interest rates. The latter were estimated as the difference between nominal long-term interest rates and expected inflation. Nominal long-term interest rates are yields on benchmark public sector bonds of around 10 years maturity. Expected inflation are generated using the low-frequency component of the annual percentage change in the GDP deflator using a Hodrick-Prescott filter. In the filtering process, a lambda value of 1600 was used

*Source:* OECD ADB.

**TERMS** = weighted terms of trade. The terms of trade are calculated as the ratio of export unit value and import unit value; data are multiplied by the average (1970-1993) value of COMP.

*Source:* OECD ADB.

*Annex B*

## INDICATORS OF THE PERVASIVENESS OF TRADE RESTRICTIONS

A number of summary indicators reflecting the level, pattern and pervasiveness of tariffs and non-tariff barriers (NTBs) have recently been computed by the OECD. Three indicators have been used in this paper to define our measure of the pervasiveness of trade restriction (TRESTR).

To capture the main features of each country's tariff structure, we used:

- The overall simple average *ad valorem* Most Favoured Nation (MFN) tariff rate.
- The overall standard deviation (SD) for all tariff lines

To capture the pervasiveness of NTBs we used

- The overall frequency ratio of “core” NTBs.

The simple MFN tariff rate captures the average *level* of protection afforded to specific groups of domestic products and thus sheds some light on the potentially distorting effects on domestic resource allocation, particularly between tradeable and non-tradeable sectors. The *dispersion* of tariff rates across all products and within specific groups of products sheds some further light on the potential distortions in economic efficiency.<sup>1</sup> For any given level of average tariff, the greater the overall and particularly the within groups (of similar, and consequently substitutable products) variability, the greater the likelihood that resources are mis-allocated due to distorted consumers' and producers' decisions.

The frequently ratio for “core” NTBs indicates the proportion of national tariff lines that are affected by this particular group of NTBs.<sup>2</sup> Thus, it indicates the *existence* of NTB measures, without providing any indication of their actual restrictiveness or impact on prices and economic efficiency. Nevertheless, the NTBs indicator can be used to shed some light on the patterns of NTBs within OECD countries and to highlight the sectors in which they are concentrated

## THE SUMMARY INDEX

Columns 1 to 3 in Table B.1 report the 1988 country averages of tariff rates, the variability of tariffs and NTBs, respectively. These averages have been calculated from sectoral data involving a breakdown of the manufacturing sectors in 36 (ISIC) branches plus agriculture.<sup>3</sup>

The simple country-averages of tariffs and NTBs may not be an accurate indicator insofar as the relative importance of the different sectors affected by tariffs and NTBs vary greatly across OECD countries. To assess the overall protection afforded by both tariffs and NTBs, columns 4 to 6 in Table B.1 report weighted tariff averages and NTB coverage ratios based on each sector's share in value-added.<sup>4</sup> EU countries

Table B.1. **Summary indicators of the pervasiveness of tariff and non-tariff trade barriers in a selected group of OECD countries**

	1		2		3		4		5		6		7	
	Most favoured nation tariffs		Core Non-tariffs barriers		Weighted average <sup>1</sup>		Most favoured nation tariffs		Core Non-tariff barriers		Summary index (%) <sup>2</sup>			
	Mean	Standard deviation	Frequency ratio	Mean	Standard deviation	Frequency ratio	Mean	Standard deviation	Frequency ratio	Mean	Standard deviation	Frequency ratio	Mean	Standard deviation
United States	6.6	9.2	25.5	1.0	0.8	14.5	94.6							
Japan	6.9	8.8	14.7	1.6	0.7	3.2	57.3							
Germany	7.5	6.1	25.4	2.8	0.8	16.1	125.7							
France	7.5	6.1	25.4	1.9	0.6	16.1	107.8							
Italy	7.5	6.1	25.4	2.1	0.6	16.9	113.2							
United Kingdom	7.5	6.1	25.4	1.9	0.6	15.9	105.1							
Canada	9.1	8.8	8.9	1.7	0.6	5.5	62.4							
Belgium	7.5	6.1	25.4	1.7	0.5	16.2	101.8							
Denmark	7.5	6.1	25.4	1.6	0.6	15.9	100.2							
Finland	7.7	10.1	10.3	1.4	0.4	6.8	56.0							
Ireland	7.5	6.1	25.4	3.6	1.3	18.5	61.6							
Netherlands	7.5	6.1	25.4	2.2	0.8	15.9	15.6							
Norway	5.7	6.8	8.7	0.7	0.2	5.6	36.8							
Portugal	7.5	6.1	25.4	2.9	0.8	18.9	37.3							
Spain	7.5	6.1	25.4	2.7	0.9	17.2	31.0							
Sweden	4.7	4.8	20.6	0.7	0.2	12.4	62.0							
Australia	11.0	10.1	15.9	2.1	0.6	9.5	83.5							

1 industry average tariffs and NTBs weighted by each sectors share of total value added

2 The weighted average of the normalised values of columns 4-6 where the weights for the MFN tariff and SD were 0.5 and the weight for NTBs was 1. Data were normalised by setting the cross-country average equal to 100

Source: See text in Annex B

differ in the weighted averages, despite the common EU trade policy, because of the different sectoral composition of their economy.

The final step of our exercise was to extract from the weighted averages of tariffs and NTBs a summary index which could account for the overall potentially distorting effects of trade policy. This summary index is presented in column 7 of Table B.1: it is a weighted average of the normalised values of columns 4 to 6. It is obviously difficult to assess on a *priori* grounds the relative importance to tariffs and NTBs on prices and economic efficiency. Our choice of the weights assigns equal importance to tariffs and NTBs (e.g. weight = 1 in both cases). For tariffs, however, both the level and variability are considered (e.g. each of the two measures receive a weight of 0.5).

## NOTES

1. It should be stressed that a uniform nominal tariff (or uniformly restrictive **NTB**) minimises the net welfare cost of such protection only if import demand elasticities are uniform across commodities, there are not intermediate inputs and cross-price effects are negligible.
2. See OECD (1996) for more details on the definitions of “core” **NTBs**.
3. The estimation of value-added-weighted tariffs and **NTBs** required: *i*) the establishment of concordances between the commodity-based Harmonised System (**HS**) in which data were originally available and the production-based **ISIC** code; *ii*) the aggregation of the resulting data at the level of the **36** manufacturing branches for which detailed information is available in the **OECD-STAN** database plus agriculture; and, *iii*) the computation of value-added weights for the **36 + I** sectors.
4. Value-added weights avoid the downward bias inherent in import-weighted indicators, although they may imply that highly-protected sectors are over represented. See **OECD** (1996).

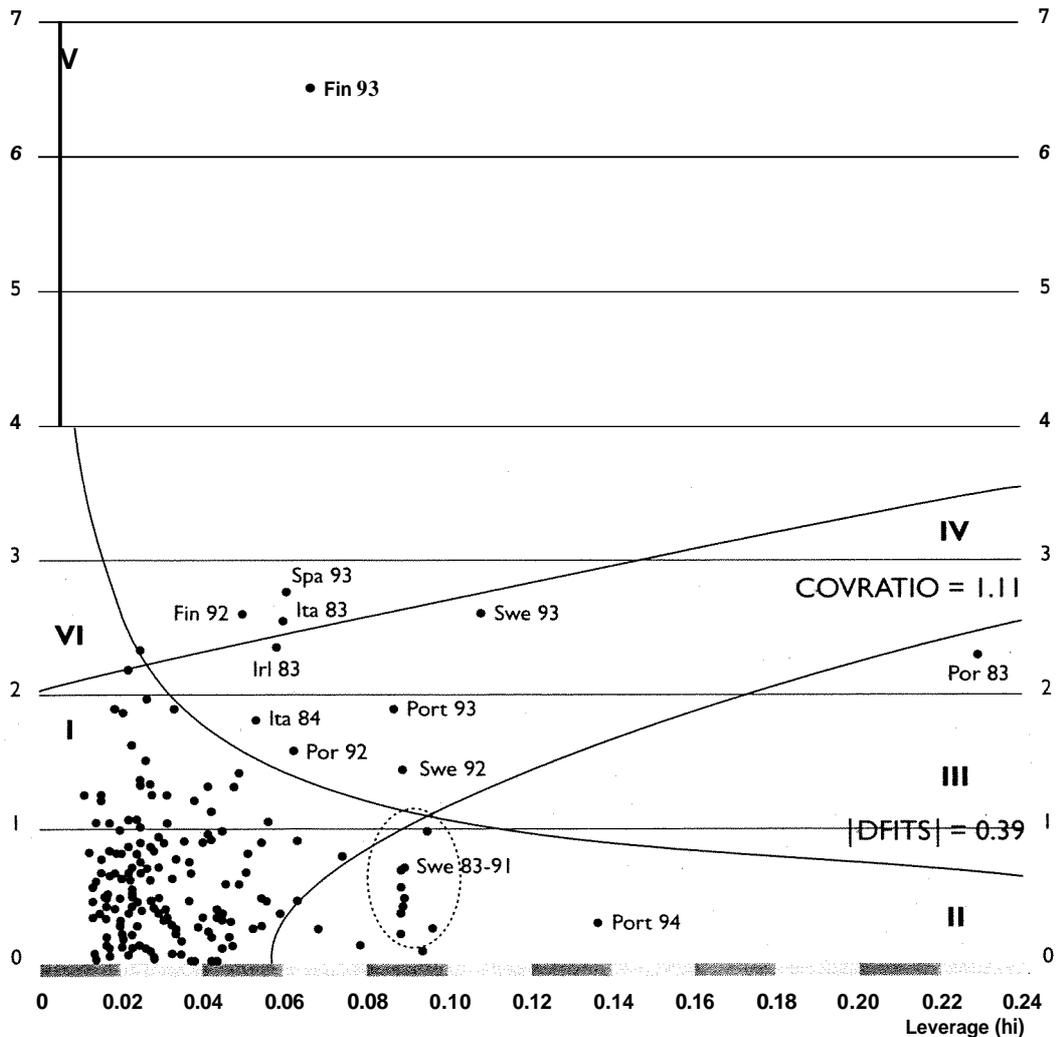
## Annex C

**SENSITIVITY ANALYSIS****OUTLIERS AND INFLUENTIAL DATA**

In any empirical investigation – and particularly those based on a small panel of cross-section time-series data – it is important to identify subsets of the data that appear to have a disproportionate influence on the estimated equation. The objective of this section of the annex is to identify these data points and assess their impact on the estimated parameters. As suggested by Fiebig (1987), a distinction should be made between outliers and influential data. The first group includes those observations which appear to be inconsistent with the remainder of the data set and are generally identified by large standardised residuals. Influential points are those that affect significantly the inference drawn from a data set.<sup>1</sup> Two indicators are used to identify outliers and influential observations (see Belsley *et al*, 1980; Fiebig 1987):

- To identify outliers we used the *studentised residuals* ( $r_i$ ). This is obtained by considering a mean-shift outlier model in which the basic equation is augmented by a dummy variable  $d$ , that has the  $i$ th element equal to one and all other elements zero. The studentised residual  $r_i$  is the  $t$ -statistics of the dummy variable and values above 2 indicate possible outliers.
- To identify influential observations we used the *leverage points* ( $h_i$ ) identified by the diagonal elements of the least-squared projection matrix, also called the hat matrix. The leverage points  $h_i$  proxies the distance between the  $i$ th observation and the centre of the data. Belsley *et al* (1980) suggest a size-adjusted cut-off value at  $2p/nobs$ , where  $p$  is the number of explanatory variables and  $nobs$  is the total number of observations.

Using the results of equation 2 in Table 1 as a benchmark, Figure C 1 plots the magnitude of  $r_i$  against  $h_i$ , the so called leverage-residual plot, (Fiebig, 1987). Points which are not outliers nor influential are clustered around the origin of the axes while disparate observations are characterised by large residuals or large leverage or a combination of both factors. In order to isolate better these observations two regression diagnostics are also superimposed on the LR plot, namely the DFITS (in absolute values) and the COVRATIO which can both be expressed as a function of  $r_i$ ,



Source: OECD

and  $h_i$ . DFITS measures the influence of an individual observation on the predicted dependent variable or fitted values. When the deletion of a single observation causes a significant change (see below) in the predicted value, it deserves further attention. COVRATIO is the ratio of the covariance matrix of the estimated coefficients obtained when the  $i$ th row has been deleted and the covariance matrix obtained with all the data. Therefore, COVRATIO measures the effect of an individual observation on the efficiency of the coefficient estimation. A COVRATIO value

lower than unity indicates a reduction in the efficiency, while a value greater than unity indicates increased efficiency.

The size-adjusted cut-off value for  $|DFITS|$  is  $2\sqrt{p/nobs}$  (equal to 0.39 in our case), while the size-adjusted cut-off values for COVRATIO are  $1 \pm 3p/nobs$  (equal to 0.89 and 1.11 in our case), see Belsley *et al* (1980). The iso-influence contours for DFITS and COVRATIO in Figure C.1 identify six regions. Region I contains points which are neither influential for DFITS nor for COVRATIO. This is the region where most of the observations are concentrated. Region II comprises points which have high leverage but small residuals. These points improve the efficiency even if they may affect significantly the estimates of specific parameters (see below). Region III includes points with high leverage but not too large residuals. For points in Region IV, residual and leverage are both relatively large but in terms of COVRATIO the two effects tend to offset each other. They are worth further examination, even if they are not likely to affect significantly the estimated parameters. Region V comprises points with a high residual, while Region VI identifies points which are characterised by a high residual but low leverage. Points in this region are important for COVRATIO but not for DFITS.

Within this framework, Figure C.1 indicates 6 data points as particularly influential: Port83, Port84, Fin92, Fin93, Ita83 and Spa93. In particular, the Portuguese data for 1983 seem to be disparate because of both large residuals and leverage; the Portuguese data for 1984, on the contrary, have small residuals but significant leverage; the Finnish data for 1993 have very large residuals but low leverage; and, finally, the data for Finland 1992, Spain 1993 and Italy 1983 have all significant residuals but are not particularly influential for the efficiency of the coefficient estimates. Furthermore, data for Sweden for the 1983-1991 period have all COVRATIO exceeding the cut-off. The latter, however, have low residuals and thus do not affect the overall results of the regression significantly.

Since our interest is mainly on the influence of each of these data points on the estimated individual coefficients, Table C.1 reports several diagnostics, including the DFBETAS which measure the change in each individual coefficient resulting from the deletion of each of these data points.

Data for Finland for the 1992-1993 period have a significant impact on most of the coefficients. This is due to the very sharp increase in unemployment rates during these two years when unemployment rose by 10 percentage points to 17.7 per cent. The Portuguese data also affect some of the estimated coefficients, albeit for the opposite reason to that of Finland. In Portugal, the unemployment rate declined during the 1980s to 5-6 per cent, despite the relatively stable labour market and institutional setting there and the growing unemployment rates in the most of the other European economies. It is also noticeable that the Swedish data, albeit not effecting the overall fit, do affect the estimated coefficient for ALMPU,

Table C 1. **Regression diagnostics**

Observation	hi	ri	DFBETAS					
			almpu	ub	epl	udens	coor	gap
Italy 1983	0 06	2 54'	0 12	0 112	-0469'	-0 361*	0 307'	0 053
Finland 1992	0 05	2 59'	-0 162*	0 14	0 056	0 151'	0 168*	-0415'
Finland 1993	0 07	651'	-0.401*	0266'	0 12	0.316*	0 476'	-1375*
Ireland 1983	0 06	2 33'	-0014	-0 366*	-0036	-0416'	0 405'	0 054
Portugal 1983	0 229'	2 308'	-0287'	-0.995*	0305'	0 49'	0 048	0 266'
Portugal 1984	0 136*	0 297	-0023	-0085	0 033	0 035	0 003	-0 026
Spain 1993	0 062	2 775'	0 095	0 327*	0 22*	-0 359'	-0 129	-0 336'
Sweden 1983	0 095*	0 982	-0282'	-0013	0 026	0 057	0 032	0 084
Sweden 1984	0 089'	0 233	-0 065	0 003	0 006	0 01	0 007	0 003
Sweden 1985	0 09'	0 49	-0 136	0015	0 013	0 023	0.012	0 01
Sweden 1986	0 088'	0 701	-0 193'	0006	0015	0 023	0 024	0012
Sweden 1987	0 088'	0 564	-0 153*	-0006	0 009	0 006	0 026	-0014
Sweden 1988	0 089*	0 435	-0 117	0 003	0 007	0 002	0019	-0 02
Sweden 1989	0 094*	0 09	-0 024	0 002	0 001	0 000	0 004	-0 008
Sweden 1990	0 097*	0 254	0067	-0006	-0003	0 003	-0012	0 026
Sweden 1991	0 089'	0 356	0094	-0005	-0005	0 003	-0 016	0013
Sweden 1992	0 089*	1436	0382'	-0045	-0026	-0 008	-0 053	-0 048
Sweden 1993	0 108'	2 605'	0721'	-0 114	-0.063	-0 073	-0 071	-0 388*

The estimates are based on equation 2 in Table 1. See the text for details on the calculation of the different indices

\* Exceeds cutoff values:  $|r_i| > 2.0$ ,  $hi > 0.0749 (2p/nobs)$ ;  $|DFBETAS| > 0.146 (2/\sqrt{(nobs)})$ . *Nobs* = number of observations. *p* = number of explanatory variables

Source: See text in Annex C

which is no surprise since this country spent almost four times as much on active programmes as the OECD average.

## INTERACTIONS BETWEEN EXPLANATORY VARIABLES

Table C 2 reports the changes in the estimated coefficients obtained by deleting one explanatory variable in turn. This exercise is useful to see whether the effect of each variable on unemployment is enhanced (reduced) by the omission of other regressors. In broad terms, the table suggests that the omission of one aspect of the bargaining process reduces the significance of the others. Moreover, the estimated effect of EPL on unemployment is strongly affected by the inclusion/exclusion of the unemployment benefit variable and the wage bargaining variables.

Table C.3 sheds some further light on the interactions between the different factors characterising the wage bargaining process. Two equations are used, one considering the co-ordination index and three indexes accounting for the interactions between union density and the different levels of co-ordination, alternatively, the index of centralisation is used together with three indexes accounting for the

Table C.2. Changes in estimated coefficients due to changes in model specification<sup>1</sup>

Panel A						
	Excluded variables					
	ALMPU	ALMPU + UB	EPL	UDENS	COOR	COOR + UDENS
ALMPU			NC	NC	HC HS	HC HS
UB	NC		NC	NC	NC	LC LS
EPL	NC	LC LS		LC LS	LC LS	LC LS
UDENS	NC	LC LS	NC		LC LS	
COOR	HC	HC HS	HC LS	LC LS		
CAP	NC	NC	NC	NC	NC	NC

	Excluded variables					
	ALMPU	ALMPU + UB	EPL	UDENS	CLWB + CLWB2	CLWB + UDENS
ALMPU			LC LS	NC	HC HS	HC HS
UB	NC		NC	NC	NC	NC
EPL	NC	LC LS		LC LS	LC LS	LC LS
UDENS	NC	LC LS	NC		LC LS	
CLWB	NC	NC	NC	LC		
CLWB2	NC	NC	NC	LS		
GAP	NC	NC	NC	NC	NC	NC

interaction with the union density. In this second case, the original CLWB ranking of countries is replaced by a simpler index which identifies low, medium and high centralisation (CORP1, CORP2 and CORP3, respectively)<sup>2</sup>. The co-ordination variables seem to have a strong role to play in the bargaining process, regardless of the level of union density. The interaction between union density and the degree of

Table C 3 **Estimates of reduced form unemployment rates equations 1983-1993<sup>1</sup>**  
 (interactions between union density and co-ordination  
 and between union density and the centralisation of wage bargaining)  
 Feasible generalised least squares

Explanatory variable	Equation version number	
	1	2
ALMPU	<b>-0.08**</b> <i>-2.06</i>	<b>-0.09**</b> <i>-2.02</i>
UB	<b>0.11***</b> <i>5.08</i>	<b>0.14***</b> <i>6.09</i>
EPL	<b>0.39*</b> <i>1.9</i>	<b>0.09</b> <i>0.49</i>
COOR2	<b>-1.59</b> <i>-0.49</i>	
COOR3	<b>-9.75*</b> <i>-1.81</i>	
INTER1	<b>0.16***</b> <i>2.97</i>	
INTER2	<b>0.08***</b> <i>2.74</i>	
INTER3	<b>0.13*</b> <i>1.95</i>	
CORP2		<b>-4.12</b> <i>-1.4</i>
CORP3		<b>-18.37**</b> <i>-2.02</i>
INTER4		<b>0.03</b> <i>0.7</i>
INTER5		<b>0.15***</b> <i>4.79</i>
INTER6		<b>0.24**</b> <i>2.03</i>
GAP	<b>-0.52***</b> <i>-16.1</i>	<b>-0.52***</b> <i>-16.14</i>
Adj R <sup>2</sup>	0.95	0.95
SEE	0.92	0.91
N of observations	181	181
N of countries	17	17

<sup>1</sup> t-statistics in italics

The dummies are as follows COOR2 = intermediate level of co-ordination COOR = 2 COOR3 = high co-ordination COOR = 3 CORP2 = intermediate level of centralisation of wage bargaining CORP3 = high level of centralisation of wage bargaining INTER1 = UDENS \* COOR1 INTER2 = UDENS \* COOR2 INTER3 = UDENS \* COOR3 INTER4 = UDENS \* CORP1 INTER5 = UDENS \* CORP2 INTER6 = UDENS \* CORP3

Source see Annex A

centralisation of the bargaining process is more complex, as also suggested by the hump-shaped hypothesis discussed in the main text. Intermediate levels of bargaining, (*i.e.* at the level of industry) seem to be always associated with higher unemployment. High centralisation seems to contribute to contain unemployment pressure: taking into account the estimated coefficient for CORP3 and the interaction

factors (INTER1 to INTER3), the impact of greater centralisation is negative, that is, it will reduce unemployment until unionisation is below 60 per cent. After this limit is passed (only Denmark, Finland and Sweden have more than 60 per cent of the work force unionised), worker bargaining power tends to offset the benefits accruing from centralisation. Decentralised systems too, are associated with lower unemployment.

## NOTES

1. It should be stressed that the concepts of outliers and influential data do not overlap: an observation may be an outlier but not overly influential or may be influential even if associated with a small standardised residual.
2. Following Calmfors and Driffil (1988) and the OECD *Employment Outlook - 1994* (Table 5. 1), the 17 countries of the panel have been classified as follows: low centralisation (CORP1) United States, Japan, Italy, United Kingdom, Canada; medium centralisation (CORP2) Germany, France, Belgium, Ireland, Netherlands, Portugal, Spain and Australia; high centralisation (CORP3) Denmark, Finland, Norway and Sweden.

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## **BENEFICIOS DE LAS PERSONAS ELEGIBLES AL TANF vs. ESCENARIO DE SALARIO MÍNIMO FEDERAL**

**PREPARADO PARA: UNIVERSIDAD INTERAMERICANA**

**MAYO DE 2015**

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## RESUMEN EJECUTIVO

Las transferencias monetarias y los programas de ayuda del gobierno proveen un apoyo importante a los grupos en desventaja económica en la Isla, pero también han creado un desbalance en los incentivos que tienen las personas para participar del mercado de trabajo. Este no es el único factor, pero sí uno de los factores responsables por el poco dinamismo del mercado laboral puertorriqueño.

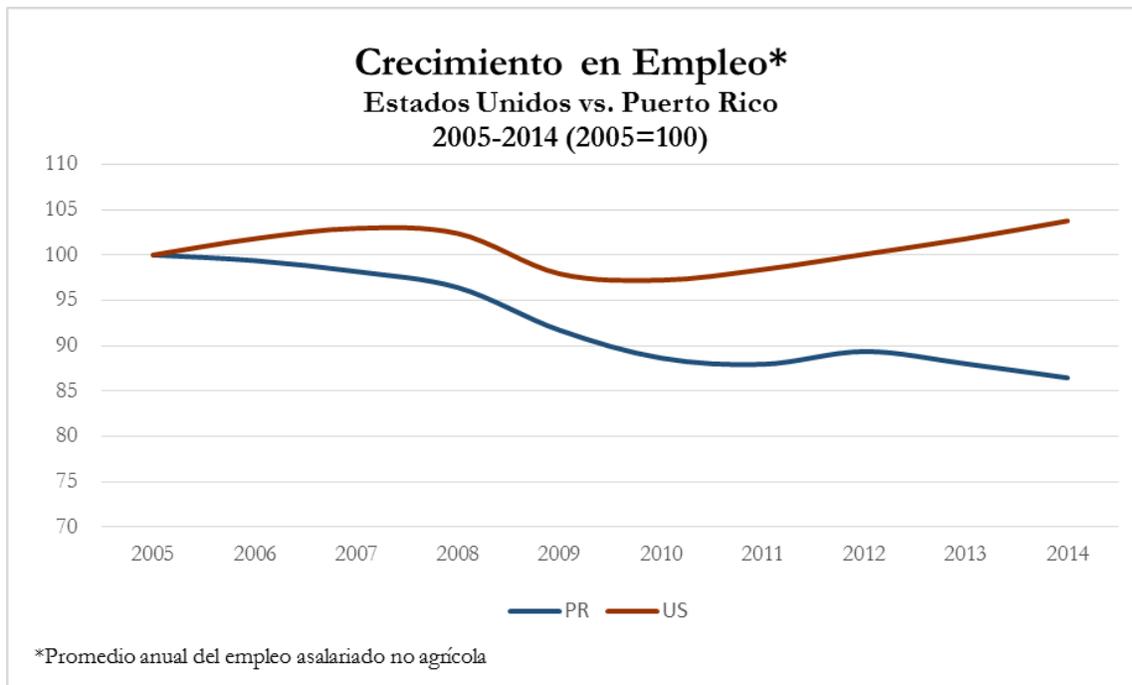
Uno de los hallazgos importantes de este estudio es que el valor total de los beneficios derivados de estas ayudas es cercano, y en algunos casos, sobrepasa los ingresos por concepto de salario si se trabajara a salario mínimo. Si el salario disponible en el mercado es igual o menor que los beneficios que la persona podría recibir estando laboralmente inactiva, sería irracional —en el sentido económico— conseguir y mantener un empleo. De hecho, toda vez que el disfrute del ocio tiene un valor económico para las personas, la decisión de estar activo en el mercado de trabajo requiere que el salario disponible sea superior por un margen razonable al conjunto de pagos de transferencia que se pueden recibir sin trabajar.

Otra consecuencia importante de toda esta situación es el número indeterminado de familias que están recurriendo a trabajos en la economía informal para no perder los beneficios de las ayudas del gobierno. Esto es una situación preocupante que tiene repercusiones en la asignación de los recursos y que puede dejar desprovistas a familias con necesidades más apremiantes.

Programas como los servicios de *Head Start* y *Early Head Start* ayudan a que una madre pueda trabajar a tiempo completo, particularmente si se combinan con otros programas (*Child Care, Pre-Kinder*) para que el infante esté atendido todo el día.

En el año 2006, se creó una política pública de dar un crédito por trabajo para aquellas personas que devengaban ingresos de hasta \$10 mil anuales. Este crédito se eliminó en el 2014 como parte de la reestructuración fiscal del Gobierno de Puerto Rico. Además, la difícil situación económica que atraviesa Puerto Rico presenta un panorama de búsqueda de empleo no muy alentador.

Al observar el crecimiento en empleo en los últimos años en Estados Unidos se observa un crecimiento moderado con muestras de recuperación. Sin embargo, el panorama de empleo en Puerto Rico luce preocupante.



## I. INTRODUCCIÓN

La Universidad Interamericana de Puerto Rico Recinto Metropolitano junto a *Human Services Research Partnership Puerto Rico* (HSRPPR) ha desarrollado una iniciativa en la que, en unión a otros sectores privados y públicos de Puerto Rico, promocionan la necesidad de evaluación de los acercamientos, servicios y prácticas relacionadas a las familias pobres y niños en Puerto Rico.

Uno de los programas que se está evaluando por el comité de investigadores es el Programa de Ayuda Temporal para Familias Necesitadas (TANF). El TANF ofrece a sus participantes una ayuda económica temporera que les permite entrenarse y crear las condiciones para alcanzar la autosuficiencia económica mediante la obtención de un empleo. A diferencia de otros programas de asistencia social, el propósito de este programa es lograr que miembros de las familias participantes se incorporen a la fuerza laboral y puedan eventualmente sustentarse por sí mismos.

En los análisis y observaciones preliminares se ha notado que algunas mujeres cualificadas para el beneficio de TANF optan por no trabajar en la economía formal en función de un salario mínimo y continuar con las ayudas económicas gubernamentales.

A través del documento se discutirá si existe un beneficio o una desventaja monetaria de trabajar bajo el salario mínimo o decidir no trabajar para poder recibir todos los beneficios que pueden obtener.

## II. ANÁLISIS DE LA ESTRUCTURA FAMILIAR

Para realizar el siguiente análisis se tomó en consideración el umbral de pobreza federal para el 2015. Véase tabla a continuación.

Umbral de Pobreza Federal 2015							
Total de Miembros en el Hogar	<u>100%</u>	<u>133%</u>	<u>150%</u>	<u>200%</u>	<u>250%</u>	<u>300%</u>	<u>400%</u>
1	\$11,770	\$15,654	\$17,655	\$23,540	\$29,425	\$35,310	\$47,080
2	\$15,930	\$21,187	\$23,895	\$31,860	\$39,825	\$47,790	\$63,720
3	\$20,090	\$26,720	\$30,135	\$40,180	\$50,225	\$60,270	\$80,360
4	\$24,250	\$32,253	\$36,375	\$48,500	\$60,625	\$72,750	\$97,000
5	\$28,410	\$37,785	\$42,615	\$56,820	\$71,025	\$85,230	\$113,640
6	\$32,570	\$43,318	\$48,855	\$65,140	\$81,425	\$97,710	\$130,280
7	\$36,730	\$48,851	\$55,095	\$73,460	\$91,825	\$110,190	\$146,920
8	\$40,890	\$54,384	\$61,335	\$81,780	\$102,225	\$122,670	\$163,560

Fuente: Federal Register, Volume 80 Issue 14

Los perfiles que se presentan a continuación fueron producidos por la base de datos *Integrated Public Use Microdata Series (IPUMS)*. Una de las más grandes bases de datos que se nutre del *American Community Survey* del 2000-2013 y del Puerto Rico *Community Survey* desde el 2005-2013. Las variables utilizadas para llegar a nuestros estimados fueron las siguientes: *total family income, number of own family members in household, marital status, any health insurance coverage y number of own children in the household*.

Al analizar los perfiles de Puerto Rico se puede observar los cambios demográficos que ha tenido la población para el periodo 2010-2013. Los cohortes de edad que más se han afectado por el cambio demográfico son los grupos jóvenes donde se observa una reducción considerable. Estos grupos son precisamente los que tienen el mayor porcentaje de personas sin seguro médico. Al desagregar por cohorte de edad, la población de menos de diecinueve (19) años es la que más se ha reducido, contrario a la población de más de sesenta y cinco (65) años que viene en aumento.

### Cambio Demográfico de la Población Total de Puerto Rico

	<u>2010</u>	<u>2013</u>	<u>Cambio #</u>	<u>Cambio %</u>
Menores de 19 años	1,012,410	928,533	(83,877)	-8.3%
20 a 34 años	747,546	708,843	(38,703)	-5.2%
35 a 44 años	487,539	473,876	(13,663)	-2.8%
45 a 64 años	928,917	904,171	(24,746)	-2.7%
Más de 65 años	545,721	599,663	53,942	9.9%
<b>Total</b>	<b>3,722,133</b>	<b>3,615,086</b>	<b>(107,047)</b>	<b>-2.9%</b>

Fuente: American Community Survey

La tabla a continuación presenta el ingreso familiar anual por miembro en el hogar para Puerto Rico 2013. Cabe resaltar que la composición familiar que predomina en la Isla es de un hogar compuesto tres (3) personas. El 16.4% del total de población indica que recibe ingresos de menos de \$5 mil anuales. Sin embargo, el 19.2% del total de la población indica recibir ingresos mayor de \$50,001.

### Ingreso Familiar Anual por Miembro del Hogar: Puerto Rico 2013

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	160,264	127,264	131,056	101,821	42,549	16,334	8,076	3,860	2,066	0	0	0	593,290
\$5,001- \$10,000	94,139	97,810	83,861	61,949	39,797	10,955	7,097	1,918	0	0	0	0	397,526
\$10,001-\$15,000	77,145	106,682	75,966	71,147	30,086	12,772	4,353	0	690	4,188	0	0	383,029
\$15,001-\$20,000	49,133	107,401	86,339	58,661	35,105	9,755	7,119	1,873	1,553	0	0	0	356,939
\$20,001-\$25,000	31,481	85,542	74,060	50,635	30,245	13,657	10,438	2,184	667	0	0	0	298,909
\$25,001-\$30,000	19,253	64,511	70,718	50,140	22,689	8,057	2,162	2,621	738	0	0	0	240,889
\$30,001-\$35,000	14,234	52,084	47,859	52,775	25,974	10,836	1,264	644	0	0	0	0	205,670
\$35,001-\$40,000	12,730	32,502	44,377	55,714	17,883	11,461	6,333	1,501	0	0	0	0	182,501
\$40,001-\$45,000	4,984	29,778	35,492	37,916	20,523	4,969	1,306	0	1,236	0	0	0	136,204
\$45,001-\$50,000	6,030	24,974	30,873	33,359	18,594	7,260	1,371	971	1,282	0	0	0	124,714
Más de \$50,001	68,161	107,183	164,208	213,660	85,277	33,964	9,860	4,699	3,031	991	2,107	1,401	694,542
No Data	0	149	0	227	497	0	0	0	0	0	0	0	873
<b>Total</b>	<b>537,554</b>	<b>835,880</b>	<b>844,809</b>	<b>788,004</b>	<b>369,219</b>	<b>140,020</b>	<b>59,379</b>	<b>20,271</b>	<b>11,263</b>	<b>5,179</b>	<b>2,107</b>	<b>1,401</b>	<b>3,615,086</b>

Fuente: IPUMS 2013

Al analizar la población de Puerto Rico que no cuenta con un seguro médico, ésta totalizó poco más de 239 mil para el 2013, siendo la tasa de población sin seguro médico de 6.62%. El tamaño del hogar más común entre la población no asegurada es de tres (3) miembros. De este grupo (tres miembros en el hogar) un poco más de 9 mil personas tienen ingresos de menos de \$10 mil anuales. Dentro de los no asegurados, hay un grupo significativo en el que solo hay una persona viviendo en el hogar.

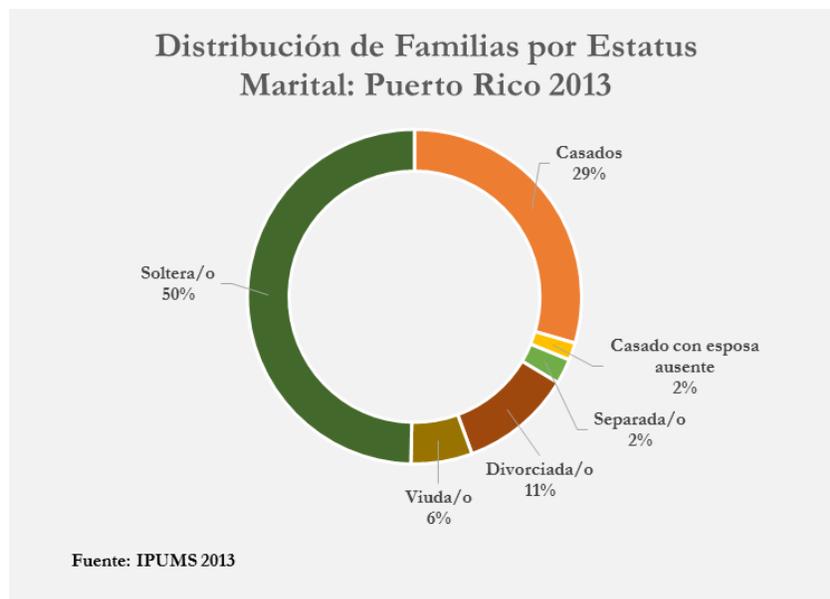
En la población sin seguro médico hay 58 mil personas que deberían cualificar para el programa de Mi Salud, ya que los ingresos son menos de \$10 mil anuales.

**Ingreso Familiar Anual por Número de Miembros en el Hogar: Sin Seguro Médico 2013**

Distribución de Ingreso	1	2	3	4	5	6	7	8	11	12	Total
Menos de \$5,000	20,091	6,335	4,517	2,897	1,680	0	119	141	0	0	35,780
\$5,001- \$10,000	5,706	6,889	4,550	3,191	1,267	561	0	0	0	0	22,164
\$10,001-\$15,000	7,670	6,877	5,694	4,432	2,541	831	238	0	0	0	28,283
\$15,001-\$20,000	7,465	8,120	7,955	2,698	2,060	219	413	0	0	0	28,930
\$20,001-\$25,000	3,310	5,588	7,447	4,090	1,488	202	184	0	0	0	22,309
\$25,001-\$30,000	1,799	4,557	6,521	2,759	342	0	0	0	0	0	15,978
\$30,001-\$35,000	948	2,352	4,211	4,535	3,163	1,023	51	62	0	0	16,345
\$35,001-\$40,000	507	1,111	2,028	2,947	1,689	0	56	553	0	0	8,891
\$40,001-\$45,000	223	1,638	2,777	2,893	3,463	144	0	0	0	0	11,138
\$45,001-\$50,000	381	1,435	3,172	1,718	1,618	1,775	104	102	0	0	10,305
Más de \$50,001	7,067	4,328	8,150	9,530	5,737	2,615	687	0	935	228	39,277
<b>Total</b>	<b>55,167</b>	<b>49,230</b>	<b>57,022</b>	<b>41,690</b>	<b>25,048</b>	<b>7,370</b>	<b>1,852</b>	<b>858</b>	<b>935</b>	<b>228</b>	<b>239,400</b>

Fuente: IPUMS 2013

A continuación se presentan las tablas de distribución de personas por estatus civil (marital) e ingreso familiar anual. Cabe resaltar que la mitad de la población es soltera, mientras que el 29% están casados.



## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Marital Casados

	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	27,916	13,343	13,522	5,801	2,912	470	827	0	0	0	0	64,791
\$5,001- \$10,000	36,699	17,138	13,877	7,836	922	472	688	0	0	0	0	77,632
\$10,001-\$15,000	49,000	18,987	18,811	6,661	2,965	593	0	0	1,432	0	0	98,449
\$15,001-\$20,000	56,039	27,032	17,750	9,532	1,839	874	733	296	0	0	0	114,095
\$20,001-\$25,000	41,742	20,225	14,822	8,035	2,718	1,427	326	161	0	0	0	89,456
\$25,001-\$30,000	36,048	23,997	16,840	5,687	3,201	412	697	300	0	0	0	87,182
\$30,001-\$35,000	27,049	18,269	20,661	8,759	2,930	500	0	0	0	0	0	78,168
\$35,001-\$40,000	18,179	16,662	18,554	4,579	3,534	1,701	386	0	0	0	0	63,595
\$40,001-\$45,000	17,250	13,966	15,794	5,185	2,038	362	0	0	0	0	0	54,595
\$45,001-\$50,000	15,327	12,536	12,269	5,993	2,521	468	204	155	0	0	0	49,473
Más de \$50,001	73,897	77,877	89,230	28,748	12,880	3,148	1,121	379	0	118	270	287,668
No Data	0	0	0	121	180	0	0	0	0	0	0	301
<b>Total</b>	<b>399,146</b>	<b>260,032</b>	<b>252,130</b>	<b>96,937</b>	<b>38,640</b>	<b>10,427</b>	<b>4,982</b>	<b>1,291</b>	<b>1,432</b>	<b>118</b>	<b>270</b>	<b>1,065,405</b>

Fuente: IPUMS 2013

## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Marital Casados Esposa Ausente

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	2,969	2,722	1,049	779	1,009	487	0	0	0	0	0	0	9,015
\$5,001- \$10,000	2,180	864	1,011	375	372	0	0	0	0	0	0	0	4,802
\$10,001-\$15,000	1,522	656	1,646	665	494	313	334	0	0	0	0	0	5,630
\$15,001-\$20,000	981	764	2,262	1,191	521	142	500	109	0	0	0	0	6,470
\$20,001-\$25,000	926	259	1,687	943	483	187	310	88	70	0	0	0	4,953
\$25,001-\$30,000	310	824	1,325	953	633	191	517	225	0	0	0	0	4,976
\$30,001-\$35,000	323	634	494	552	384	418	61	219	0	0	0	0	3,085
\$35,001-\$40,000	561	213	579	1,006	887	255	0	172	0	0	0	0	3,673
\$40,001-\$45,000	173	237	604	35	0	108	202	0	98	0	0	0	1,457
\$45,001-\$50,000	189	301	1,359	367	369	0	133	0	0	0	0	0	2,718
Más de \$50,001	6,041	382	1,928	2,669	1,838	693	89	479	0	275	73	84	14,551
<b>Total</b>	<b>16,175</b>	<b>7,856</b>	<b>13,942</b>	<b>9,535</b>	<b>6,990</b>	<b>2,794</b>	<b>2,146</b>	<b>1,292</b>	<b>168</b>	<b>275</b>	<b>73</b>	<b>84</b>	<b>61,330</b>

Fuente: IPUMS 2013

## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Marital Separada/o

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	8,567	5,211	3,306	2,189	1,241	161	0	0	0	0	0	0	20,675
\$5,001- \$10,000	4,279	2,464	2,777	1,852	1,406	89	775	74	0	0	0	0	13,716
\$10,001-\$15,000	5,268	1,623	1,518	1,718	237	155	0	0	36	117	0	0	10,672
\$15,001-\$20,000	1,887	3,267	2,225	976	707	299	0	0	0	0	0	0	6,488
\$20,001-\$25,000	2,023	1,775	1,200	350	433	501	206	0	0	0	0	0	9,361
\$25,001-\$30,000	559	1,641	2,030	1,326	378	411	0	0	0	0	0	0	6,345
\$30,001-\$35,000	726	942	298	407	325	106	0	0	0	0	0	0	2,804
\$35,001-\$40,000	912	303	712	770	110	56	0	0	0	0	0	0	2,863
\$40,001-\$45,000	268	362	156	664	386	73	0	0	0	0	0	0	1,909
\$45,001-\$50,000	474	136	1,576	972	503	142	138	0	0	0	0	0	3,941
Más de \$50,001	1,323	2,133	2,451	1,295	880	200	247	0	70	0	223	56	8,878
No Data	0	77	0	0	0	0	0	0	0	0	0	0	77
<b>Total</b>	<b>26,286</b>	<b>19,934</b>	<b>18,249</b>	<b>12,519</b>	<b>6,606</b>	<b>2,193</b>	<b>1,366</b>	<b>74</b>	<b>106</b>	<b>117</b>	<b>223</b>	<b>56</b>	<b>87,729</b>

Fuente: IPUMS 2013

## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Marital Divorciada/o

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	42,222	13,460	9,998	4,211	1,389	284	106	111	131	0	0	0	71,912
\$5,001- \$10,000	28,620	11,511	6,555	2,947	1,769	298	240	81	0	0	0	0	52,021
\$10,001-\$15,000	24,625	11,345	8,034	2,191	1,242	391	272	0	240	149	0	0	48,489
\$15,001-\$20,000	16,041	10,708	6,462	2,911	1,591	600	299	0	0	0	0	0	38,612
\$20,001-\$25,000	13,643	10,246	8,569	3,276	1,690	314	862	0	0	0	0	0	38,600
\$25,001-\$30,000	7,329	7,343	6,363	2,887	1,742	261	0	0	158	0	0	0	26,083
\$30,001-\$35,000	5,614	6,461	6,538	1,607	562	460	0	0	0	0	0	0	21,242
\$35,001-\$40,000	5,107	4,281	4,714	2,187	1,048	931	332	0	0	0	0	0	18,600
\$40,001-\$45,000	1,893	3,454	3,840	1,100	1,156	99	0	0	68	0	0	0	11,610
\$45,001-\$50,000	2,377	2,705	1,625	1,515	952	582	185	0	249	0	0	0	10,190
Más de \$50,001	16,598	8,370	12,360	7,248	4,981	2,034	502	669	508	0	239	175	53,684
<b>Total</b>	<b>164,069</b>	<b>89,884</b>	<b>75,058</b>	<b>32,080</b>	<b>18,122</b>	<b>6,254</b>	<b>2,798</b>	<b>861</b>	<b>1,354</b>	<b>149</b>	<b>239</b>	<b>175</b>	<b>391,043</b>

Fuente: IPUMS 2013

## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Marital Viuda/o

	1	2	3	4	5	6	7	8	9	10	12	Total
Menos de \$5,000	22,735	6,795	1,564	1,497	706	175	105	0	0	0	0	33,577
\$5,001- \$10,000	30,107	8,871	2,361	943	638	0	127	0	0	0	0	43,047
\$10,001-\$15,000	20,350	8,493	2,224	488	810	372	155	0	0	334	0	33,226
\$15,001-\$20,000	7,708	8,169	3,684	1,051	1,142	449	107	97	0	0	0	22,407
\$20,001-\$25,000	4,384	7,371	4,232	2,334	849	397	606	0	0	0	0	20,173
\$25,001-\$30,000	2,777	3,685	3,373	1,122	575	0	0	0	0	0	0	11,532
\$30,001-\$35,000	1,602	2,994	2,636	1,038	383	390	0	60	0	0	0	9,103
\$35,001-\$40,000	2,221	1,740	1,613	1,157	208	460	0	0	0	0	0	7,399
\$40,001-\$45,000	448	2,471	1,709	665	1,021	122	0	0	191	0	0	6,627
\$45,001-\$50,000	313	1,407	524	825	230	0	0	0	0	0	0	3,299
Más de \$50,001	7,273	4,259	5,382	2,786	2,659	803	437	356	51	0	186	24,192
<b>Total</b>	<b>99,918</b>	<b>56,255</b>	<b>29,302</b>	<b>13,906</b>	<b>9,221</b>	<b>3,168</b>	<b>1,537</b>	<b>513</b>	<b>242</b>	<b>334</b>	<b>186</b>	<b>214,582</b>

Fuente: IPUMS 2013

## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Soltera/o

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	83,771	71,160	101,796	79,623	32,403	12,315	7,395	2,922	1,935	0	0	0	393,320
\$5,001- \$10,000	28,953	37,401	54,019	41,955	27,776	9,646	5,483	1,075	0	0	0	0	206,308
\$10,001-\$15,000	25,380	35,565	43,557	47,274	20,642	8,576	2,999	0	414	2,156	0	0	186,563
\$15,001-\$20,000	22,516	28,454	44,674	34,782	21,612	6,426	5,339	934	1,257	0	0	0	165,994
\$20,001-\$25,000	10,505	24,149	38,147	28,910	18,755	9,540	7,027	1,770	436	0	0	0	139,239
\$25,001-\$30,000	8,278	14,970	33,632	27,012	13,674	3,993	1,233	1,699	280	0	0	0	104,771
\$30,001-\$35,000	5,969	14,004	19,624	28,510	15,561	6,532	703	365	0	0	0	0	91,268
\$35,001-\$40,000	3,929	7,786	20,097	32,040	11,051	6,225	4,300	943	0	0	0	0	86,371
\$40,001-\$45,000	2,202	6,004	15,217	19,658	12,775	2,529	742	0	879	0	0	0	60,006
\$45,001-\$50,000	2,677	5,098	13,253	17,411	10,547	4,015	447	767	878	0	0	0	55,093
Más de \$50,001	36,926	18,142	64,210	110,432	46,171	17,354	5,437	2,074	2,023	716	1,454	630	305,569
No Data	0	72	0	106	317	0	0	0	0	0	0	0	495
<b>Total</b>	<b>231,106</b>	<b>262,805</b>	<b>448,226</b>	<b>467,713</b>	<b>231,284</b>	<b>87,151</b>	<b>41,105</b>	<b>12,549</b>	<b>8,102</b>	<b>2,872</b>	<b>1,454</b>	<b>630</b>	<b>1,794,997</b>

Fuente: IPUMS 2013

El 48% de las personas que se catalogaron como soltera/os en el 2013 fueron mujeres. De éstas un poco más de 207 mil reciben ingresos de menos de \$5 mil al año.

## Ingreso Familiar Anual por Número de Miembros en el Hogar: Estatus Mujeres Solteras

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Menos de \$5,000	41,298	38,454	55,567	41,645	17,628	5,494	3,893	1,671	1,550	0	0	0	207,200
\$5,001- \$10,000	13,797	17,158	26,668	23,195	13,834	4,202	3,042	648	0	0	0	0	102,544
\$10,001-\$15,000	10,843	18,112	19,262	22,091	10,825	3,874	1,982	0	156	1,357	0	0	88,502
\$15,001-\$20,000	8,850	13,012	19,048	16,612	8,932	3,217	2,786	387	198	0	0	0	73,042
\$20,001-\$25,000	5,189	9,823	17,956	13,300	9,593	4,653	2,086	1,089	151	0	0	0	63,840
\$25,001-\$30,000	3,518	7,668	16,185	12,039	6,544	2,044	717	941	169	0	0	0	49,825
\$30,001-\$35,000	3,636	7,716	8,634	14,757	7,102	3,338	512	179	0	0	0	0	45,874
\$35,001-\$40,000	1,899	3,954	9,895	16,289	3,818	3,813	2,551	762	0	0	0	0	42,981
\$40,001-\$45,000	1,128	2,859	6,641	11,446	6,326	1,448	359	0	158	0	0	0	30,365
\$45,001-\$50,000	1,106	3,201	5,498	6,889	5,924	1,897	141	665	605	0	0	0	25,926
Más de \$50,001	11,518	8,597	29,666	51,509	20,953	9,332	2,798	632	709	320	658	326	137,018
No Data	0	0	0	0	205	0	0	0	0	0	0	0	205
<b>Total</b>	<b>102,782</b>	<b>130,554</b>	<b>215,020</b>	<b>229,772</b>	<b>111,684</b>	<b>43,312</b>	<b>20,867</b>	<b>6,974</b>	<b>3,696</b>	<b>1,677</b>	<b>658</b>	<b>326</b>	<b>867,322</b>

Fuente: IPUMS 2013

Al desagregar la información y distribuirla por número de niños en el hogar resultó en más de 700 mil hogares de mujeres solteras que no tienen niños.

## Ingreso Familiar Anual por Número de Niños en el Hogar de Mujeres Solteras

	0	1	2	3	4	5	6	7	8	Total
<b>Menos de \$5,000</b>	156,909	22,254	17,751	6,553	2,773	861	99	0	0	207,200
<b>\$5,001- \$10,000</b>	84,656	8,050	6,218	2,280	1,001	339	0	0	0	102,544
<b>\$10,001-\$15,000</b>	75,938	7,077	2,039	2,883	450	62	0	53	0	88,502
<b>\$15,001-\$20,000</b>	63,715	5,307	2,979	930	71	40	0	0	0	73,042
<b>\$20,001-\$25,000</b>	56,043	3,509	3,035	1,040	213	0	0	0	0	63,840
<b>\$25,001-\$30,000</b>	44,232	3,750	1,843	0	0	0	0	0	0	49,825
<b>\$30,001-\$35,000</b>	41,456	2,994	818	606	0	0	0	0	0	45,874
<b>\$35,001-\$40,000</b>	38,509	2,844	1,353	275	0	0	0	0	0	42,981
<b>\$40,001-\$45,000</b>	27,465	2,216	313	321	50	0	0	0	0	30,365
<b>\$45,001-\$50,000</b>	23,518	1,503	905	0	0	0	0	0	0	25,926
<b>Más de \$50,001</b>	130,179	5,133	1,139	390	79	98	0	0	0	137,018
<b>No Data</b>	205	0	0	0	0	0	0	0	0	205
<b>Total</b>	<b>742,620</b>	<b>64,637</b>	<b>38,393</b>	<b>15,278</b>	<b>4,637</b>	<b>1,400</b>	<b>99</b>	<b>53</b>	<b>0</b>	<b>867,322</b>

Fuente: IPUMS 2013

### III. CRITERIOS DE ELEGIBILIDAD Y BENEFICIOS DE LOS PROGRAMAS DE ASISTENCIA SOCIAL Y ECONÓMICA

#### Programa de Asistencia Nutricional (PAN)

El Programa de Asistencia Nutricional conocido como PAN ofrece ayuda económica a familias de escasos recursos para que puedan cubrir sus necesidades alimentarias. Las personas que son elegibles al beneficio de mi PAN tienen que utilizar el 75% de los beneficios en compras de alimentos y el 25% restante puede ser obtenido en dinero en efectivo a través de un cajero automático.

Los requisitos del programa son los siguientes: tener residencia en Puerto Rico y tener capital (cuenta de ahorros, cuenta corriente, etc.) de hasta \$2,000. Los hogares con una persona de sesenta (60) años o más pueden tener un capital de hasta \$3,000. Los hogares en Puerto Rico tienen que cumplir con un límite de ingreso neto que varía según el número de personas en el hogar. El ingreso neto se calcula tomando el monto total de ingresos del hogar y restando las deducciones por tipo de ingreso, número de miembros en el hogar, y ciertos gastos permitidos. Los criterios de elegibilidad por miembros del hogar se presentan a continuación.

**Tabla de Beneficio e Ingreso Neto Máximo: PAN**

<u>Miembro Nucleo de Servicio</u>	<u>Beneficio Máximo</u>	<u>Ingreso Neto Máximo</u>	<u>Límite de Nivel de Ingresos Anual</u>
1	\$112	\$233	\$2,796
2	\$216	\$466	\$5,592
3	\$315	\$599	\$7,188
4	\$410	\$713	\$8,556
5	\$499	\$826	\$9,912
6	\$599	\$943	\$11,316
7	\$679	\$1,059	\$12,708
8	\$776	\$1,173	\$14,076
9	\$874	\$1,289	\$15,468
10	\$972	\$1,409	\$16,908
11	\$1,069	\$1,523	\$18,276
12	\$1,167	\$1,636	\$19,632
13	\$1,264	\$1,753	\$21,036
14	\$1,362	\$1,869	\$22,428
15	\$1,459	\$1,983	\$23,796
16	\$1,557	\$2,096	\$25,152
17	\$1,654	\$2,213	\$26,556
18	\$1,752	\$2,343	\$28,116

Fuente: Información provista por ADSEF

### Sección 8

El programa Sección 8 se crea bajo la Ley de Vivienda y Desarrollo Urbano (HUD en adelante) en el 1974. El beneficio del programa es el ofrecimiento de un subsidio para rentar una residencia a familias de bajos ingresos. Los requisitos básicos del programa son ser categorizada como una familia, cumplir con los límites de ingresos establecidos por HUD, ser ciudadano americano y ser mayor de edad. En Puerto Rico existen varias agencias tanto municipales como estatales que ofrecen los servicios de Sección 8. Cabe resaltar que el programa les provee a las familias unos vales para que puedan buscar un apartamento o residencia apropiado. La cantidad de vales están limitados y siempre hay listas de espera.

HUD establece los límites de ingreso según el ingreso mediano de la familia tanto por área metropolitana y municipal. Además para establecer estos límites se toma en consideración la composición de la familia. En la tabla a continuación se presentan los límites de ingreso de Puerto Rico para el año fiscal 2015.

Límites de Ingreso Puerto Rico: Programa Sección 8 - 2015								
Ingreso Mediano de la Familia	<u>1</u> Persona	<u>2</u> Personas	<u>3</u> Personas	<u>4</u> Personas	<u>5</u> Personas	<u>6</u> Personas	<u>7</u> Personas	<u>8</u> Personas
<b>\$19,700</b>								
<b>Extra Bajo Ingreso</b>	\$5,000	\$5,700	\$6,400	\$7,100	\$7,700	\$8,250	\$8,850	\$9,400
<b>Muy Bajo Ingreso</b>	\$8,300	\$9,450	\$10,650	\$11,800	\$12,750	\$13,700	\$14,650	\$15,600
<b>Bajo Ingreso</b>	\$13,250	\$15,150	\$17,050	\$18,900	\$20,450	\$21,950	\$23,450	\$24,950

Fuente: HUDUSERHUD.GOV U.S. Department of Housing and Urban Development Secretary Julián Castro

La siguiente tabla presenta el alquiler equitativo del mercado (FMR) que es determinado por HUD según el número de dormitorios por área metropolitana. Esta misma tabla se prepara por municipalidad. Véase la sección de anejos.

## Alquiler Equitativo del Mercado

Año Fiscal 2015 - Resumen por Area de Puerto Rico

Nombre del Area	"Efficiency"	Una	Dos	Tres	Cuatro	"FMR"
		Habitación	Habitaciones	Habitaciones	Habitaciones	Percentila
Aguadilla-Isabela-San Sebastián, PR MSA	\$420	\$443	\$530	\$683	\$725	40
Fajardo, PR MSA	\$432	\$455	\$545	\$792	\$850	40
Guayama, PR MSA	\$331	\$412	\$558	\$691	\$773	40
Mayagüez, PR MSA	\$375	\$396	\$475	\$630	\$798	40
Ponce, PR MSA	\$400	\$422	\$506	\$734	\$884	40
San Germán-Cabo Rojo, PR MSA	\$335	\$354	\$425	\$599	\$718	40
Arecibo, PR HUD Metro FMR Area	\$370	\$390	\$468	\$647	\$660	40
Caguas, PR HUD Metro FMR Area	\$415	\$423	\$550	\$799	\$901	40
San Juan-Guaynabo, PR HUD Metro FMR Area	\$464	\$502	\$601	\$810	\$975	40
Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area	\$314	\$350	\$420	\$519	\$570	40
Yauco, PR MSA	\$330	\$349	\$419	\$560	\$730	40
<b>Promedio para Puerto Rico</b>	<b>\$381</b>	<b>\$409</b>	<b>\$500</b>	<b>\$679</b>	<b>\$780</b>	<b>-</b>

Fuente: "U.S. Department of Housing and Urban Development"

Programa WIC

El programa WIC le provee ayuda nutricional a toda mujer que cumpla con los requisitos que establece el programa. Estos son: mujer embarazada, mujer postparto hasta seis (6) meses después del parto, mujer lactante hasta un (1) año después del parto, infante hasta su primer año y niño hasta su quinto año de edad. La solicitante debe de vivir o trabajar cerca de la zona que cubre la Clínica WIC. Para participar en el programa debe de cumplir con las guías de ingresos del gobierno federal. Las personas que participan en dicho programa automáticamente pueden solicitar los programas del PAN, Mi Salud, TANF y los programas de *Early Head Start* y *Head Start*. A continuación se presenta la tabla de elegibilidad.

Guía de Elegibilidad por Ingreso para el Programa WIC					
Tamaño del Hogar	Anual	Mensual	Quincenal	Bi-mensual	Bi-semanal
1	\$21,590	\$1,800	\$900	\$831	\$416
2	29,101	2,426	1,213	1,120	560
3	36,612	3,051	1,526	1,409	705
4	44,123	3,677	1,839	1,698	849
5	51,634	4,303	2,152	1,986	993
6	59,145	4,929	2,465	2,275	1,138
7	66,656	5,555	2,778	2,564	1,282
8	74,167	6,181	3,091	2,853	1,427
<b>Miembro Adicional</b>	<b>7,511</b>	<b>626</b>	<b>313</b>	<b>289</b>	<b>145</b>

Nota: Efectivo desde 1 de julio de 2014 hasta el 30 de junio de 2015.

**Programa de Ayuda Temporal para Familias Necesitadas (TANF)**

El propósito del programa TANF es ofrecer a sus participantes (familias de bajos recursos con hijos) un ayuda económica temporera que les permita entrenarse y crear las condiciones para alcanzar la autosuficiencia económica mediante la obtención de un empleo. El programa tiene como propósito reducir los niveles de pobreza de las familias mediante servicios de colocación laboral y recursos comunitarios y profesionales que están a disposición de los participantes y los empleadores. El TANF ofrece un subsidio de 100% del salario por doce (12) meses a los negocios o entidades que empleen a los participantes del programa, además de proveer una red de recursos comunitarios y profesionales al servicio de estas entidades. El TANF es una ayuda temporera que se les otorga a las familias que cualifiquen para incorporar o re-incorporar a uno de sus miembros a la fuerza laboral y que puedan eventualmente sustentarse por sí mismos.

A continuación se presenta la tabla de necesidades básicas ajustadas de alimentos, ropa, efectos personales, luz, agua y combustible. Esta cifra que se le paga mensual a la persona o familia y no incluye el albergue.

<b>Familias Necesitadas Puerto Rico: TANF</b>			
CANTIDAD MENSUAL DE ACUERDO AL NÚMERO DE PERSONAS EN CADA NÚCLEO CATEGÓRICO O PRESUPUESTAL			
A.CATEGORÍA			
<b>Núcleo Compuesto de</b>	<b>Necesidades Básicas Reconocidas 100%</b>	<b>Necesidades Básicas Ajustadas 50%</b>	<b>Necesidades Básicas Reconocidas 185%</b>
1 persona	\$166.00	\$83.00	\$307.00
2 personas	\$290.00	\$145.00	\$537.00
3 personas	\$414.00	\$207.00	\$766.00
4 personas	\$538.00	\$269.00	\$995.00
5 personas	\$662.00	\$331.00	\$1,225.00
6 personas	\$786.00	\$393.00	\$1,454.00
7 personas	\$910.00	\$455.00	\$1,684.00
8 personas	\$1,034.00	\$517.00	\$1,913.00
9 personas	\$1,158.00	\$579.00	\$2,142.00
10 personas	\$1,282.00	\$641.00	\$2,372.00
11 personas	\$1,406.00	\$703.00	\$2,601.00
12 personas	\$1,530.00	\$765.00	\$2,831.00
Personas adicionales	\$124.00	\$62.00	\$229.00

Fuente: Departamento de la Familia y Departamento de Desarrollo Socioeconómico Programa TANF

**B.CATEGORÍA DE ANCIANOS (A), CIEGOS (B), INCAPACITADOS (D).  
GENERAL (G) Y NIÑOS (T)**

ANCIANOS (A)	\$64.00	\$64.00
INCAPACITADOS (D), CIEGOS MENORES Y MAYORES DE 18 AÑOS (B)	\$64.00	\$64.00
INCAPACITADOS MENORES (D) Y MAYORES DE 18 AÑOS (G)	\$64.00	\$64.00
NIÑOS CON TUTORES (T)	\$32.00	\$32.00

Fuente: Departamento de la Familia y Departamento de Desarrollo Socioeconómico Programa TANF

**Programa Mi Salud**

Mi Salud es el seguro de salud del Gobierno de Puerto Rico el cual asegura a toda la población médico-indigente del país. Este es administrado por la Administración de Seguros de Salud (ASES). Mi Salud es uno de los seguros de salud más completos en términos de cubierta cuando se compara con otros seguros comerciales disponibles en el mercado. El umbral de pobreza para cualificar para este programa es de hasta un 200%, es decir, el máximo de ingreso para una persona cualificar es de \$800 mensuales. Los beneficiarios del componente federal de Mi Salud (100-110 -nivel indigencia de 0-1), es la población que reporta tener de \$0-\$400 dólares de ingresos mensuales. El otro grupo son los “state”, los cuales son categorizados en los grupos de 320-330 (nivel indigencia de 2-3). Véase la tabla a continuación.

**Criterios de Elegibilidad Mi Salud**

**Criterios de Elegibilidad en Asistencia Médica:**

Nivel Indigencia ASES		0	1	2	3	4
Nivel Indigencia Asistencia Médica		0% a 50%	51% a 100%	101% a 130%	131% a 200%	No Elegible
Composición Familiar	Ingreso Básico					
1	\$400	\$0 a \$200	\$201 a \$400	\$401 a \$520	\$521 a \$800	Ingresos en exceso del máximo en nivel 3, no son elegibles al Seguro de Salud
2	\$495	\$0 a \$248	\$249 a \$495	\$496 a \$ 644	\$645 a \$990	
3	\$590	\$0 a \$295	\$296 a \$590	\$591 a \$767	\$768 a \$1,180	
4	\$685	\$0 a \$343	\$344 a \$685	\$686 a \$891	\$892 a \$1,370	
5	\$780	\$0 a \$390	\$391 a \$780	\$781 a \$1,014	\$1,015 a \$1,560	
6	\$875	\$0 a \$438	\$439 a \$875	\$876 a \$1,138	\$1,139 a \$1750	
7	\$970	\$0 a \$485	\$486 a \$970	\$971 a \$1,261	\$1,262 a \$1,940	
8	\$1,065	\$0 a \$533	\$534 a \$1,065	\$1,066 a \$ 1385	\$1,386 a \$2,130	
9	\$1,160	\$0 a \$580	\$581 a \$1,160	\$1,161 a \$1,508	\$1,509 a \$2,320	
10	\$1,255	\$0 a \$628	\$629 a \$1,255	\$1,256 a \$1,632	\$1,633 a \$2,510	
11	\$1,350	\$0 a \$675	\$676 a \$1,350	\$1,351 a \$1,755	\$1,756 a \$2,700	
12	\$1,445	\$0 a \$723	\$724 a \$1,445	\$1,446 a \$1,879	\$1,880 a \$2,890	
13	\$1,540	\$0 a \$770	\$771 a \$1,540	\$1,541 a \$2,002	\$2,003 a \$3,080	
14	\$1,635	\$0 a \$818	\$819 a \$1,635	\$1,636 a \$2,126	\$2,127 a \$3,270	
15	\$1,730	\$0 a \$865	\$866 a \$1,730	\$1,731 a \$2,249	\$2,250 a \$3,460	

Fuente: ASES

### *Subsidio para Servicio Telefónico a través del Fondo de Servicio Universal*

Este programa le ofrece subsidios para los servicios de telecomunicaciones a toda persona de escasos recursos económicos que cualifiquen. Estos aplican al pago de la renta mensual al teléfono residencial o celular. El subsidio es aplicable a cualquier plan de servicio que incluya servicios de voz, incluyendo planes combinados de servicios de voz y data; planes que incluyan funciones opcionales tales como, pero no limitados a: identificación de llamadas, llamada en espera, correo de voz y llamadas en conferencia, y a planes de familia compartidos, por unidad económica familiar o por persona.

En Puerto Rico, el subsidio aplica al programa *Lifeline* y es por \$12.75. Este proviene de dos fondos: \$9.25 del Fondo del Servicio Universal Federal y \$3.50 del gobierno estatal. Para ser beneficiario la persona debe participar en algunos de los programas de ayudas del Gobierno.

### *Subsidio de Agua y Luz*

El subsidio de la Autoridad de Acueductos y Alcantarillados (AAA) representa alrededor del 30% de la factura. Para solicitar dicho subsidio los solicitantes deben de participar en el programa del PAN, TANF y/o tener sesenta y cinco (65) años o más. En el caso de la Autoridad de Energía Eléctrica (AEE), el subsidio aplica a los primeros 425 kW de consumo en el mes. Este subsidio varía dependiendo del ajuste de combustible y generalmente oscila entre \$7-\$9 al mes. Para este subsidio cualifican automáticamente estudiantes, personas de sesenta y cinco (65) años o más y personas participantes del programa PAN.

#### IV. ANÁLISIS DE INGRESOS A TIEMPO PARCIAL Y A TIEMPO COMPLETO

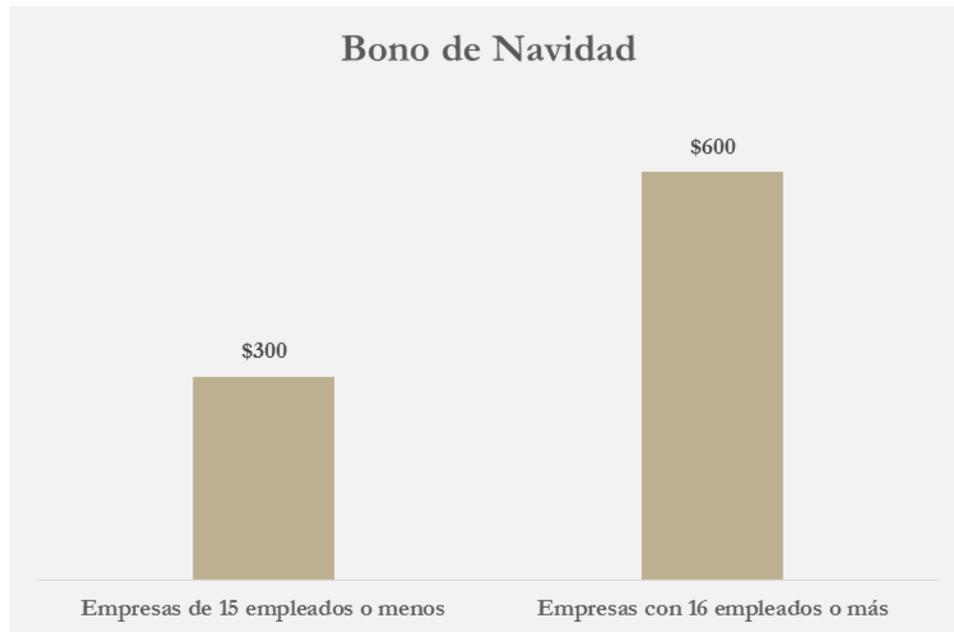
El Congreso de los Estados Unidos es la entidad gubernamental que determina el salario mínimo. En Puerto Rico, la Ley 80 del 27 julio 1998 conocida como la Ley de Salario Mínimo, Vacaciones y Licencia por Enfermedad de Puerto Rico, establece que la Ley de Normas Razonables del Trabajo aprobada por el Congreso de los Estados Unidos en el 1985 y sus enmiendas aplican automáticamente a Puerto Rico. Además, establece que aquellas empresas no cubiertas por la Ley Federal deberán pagar un salario mínimo equivalente al 70% del salario mínimo prevaleciente.

En los últimos años los aumentos en salario mínimo han ocurrido en una forma escalonada, por lo general, implantando el aumento en tres (3) o cuatro (4) años. El último aumento ocurrió en el año 2009 y es el salario mínimo por hora prevaleciente en la actualidad (\$7.25 por hora).

Una persona que tiene un trabajo de veinte (20) horas a la semana a un salario de \$7.25 por hora estaría generando un ingreso bruto anual de \$7,540. Sin embargo, se le aplican las deducciones que corresponden por Ley del Seguro Social 6.2%, Medicare 1.45% e incapacidad .30%. Para esta persona queda un ingreso neto anual de \$6,942 o \$579 mensual. Las mismas deducciones aplican a personas que trabajas cuarenta (40) horas a la semana, resultando en un ingreso neto anual de \$13,905 o \$1,158 mensual.

<b>Análisis de Salario Mínimo a Tiempo Parcial y a Tiempo Completo</b>			
	<b><u>Deducción %</u></b>	<b><u>Trabajador a Tiempo Parcial</u></b>	<b><u>Trabajador a Tiempo completo</u></b>
Horas Trabajadas		1,040	2,080
Pago por Hora		\$7.25	\$7.25
<b>Salario Bruto</b>		<b>\$7,540</b>	<b>\$15,080</b>
<b>Deducciones</b>			
Seguro Social	6.20%	\$467.48	\$934.96
Medicare	1.45%	\$109.33	\$218.66
Incapacidad	0.30%	\$21.00	\$21.00
<b>Total Deducciones</b>		<b>\$597.81</b>	<b>\$1,174.62</b>
<b>Salario Neto Anual</b>		<b>\$6,942</b>	<b>\$13,905</b>

Cabe resaltar que el beneficio del Bono de Navidad aplicaría para ambos empleados tanto a tiempo parcial como a tiempo completo, siempre y cuando el empleado a tiempo parcial cumpla con más de setecientas (700) horas de trabajo en un año. El bono mínimo por ley va a variar de acuerdo al número de empleados de la empresa. Véase la gráfica a continuación.



## V. ANÁLISIS CUANTITATIVO DE LOS BENEFICIOS

### *Beneficios Adicionales al TANF*

Al hablar de transferencias, es importante distinguir entre dos tipos de transferencias: las devengadas y las otorgadas. Las primeras son aquellas a las cuales las personas tienen un derecho adquirido (*entitlement*) por virtud de aportaciones pasadas, como en el caso del seguro social, desempleo y las pensiones de jubilación. Las segundas son las que reciben las personas sin haber hecho aportación alguna, por virtud de algún programa gubernamental que combate de la pobreza. En esta segunda categoría se destacan las transferencias del Programa de Asistencia Nutricional (PAN), las del sistema *Medicaid* y la beca para estudiantes universitarios *Pell Grant*.

En el caso de las transferencias que provienen del Gobierno de Puerto Rico (un poco menos de una cuarta parte del total), la mayoría son devengadas, ya que consisten principalmente de pagos de pensiones a empleados públicos retirados. La porción de las transferencias estatales que son otorgadas no se conoce con exactitud, pero es menor y consiste de pagos a la Reforma de Salud ahora conocida como Mi Salud y las aportaciones locales a los programas de beneficencia pública federal (por ejemplo, en la vivienda subsidiada de los residenciales públicos).

Las personas que cualifican para el TANF generalmente también cualifican para varias ayudas gubernamentales que provienen de fondos Estatales y Federales. Algunos de los programas son: Programa de Asistencia Nutricional (PAN), el Programa de Asistencia Médica (*Medicaid*), los Programas Early Head Start y Head Start y el WIC. Además, cualifican para los subsidios de agua, luz, teléfono y celular.

El subsidio de la Autoridad de Acueductos y Alcantarillados (AAA) representa alrededor del 30% de la factura. Para solicitar dicho subsidio los solicitantes deben de participar en el programa del PAN, TANF y/o tener sesenta y cinco (65) años o más. En el caso de la Autoridad de Energía Eléctrica (AEE), el subsidio aplica a los primeros 425 kW de consumo en el mes. Este subsidio varía dependiendo del ajuste de combustible y generalmente oscila entre \$7-\$9 al mes. Para este subsidio cualifican automáticamente estudiantes, personas de sesenta y cinco (65) años o más y personas participantes del programa PAN.

En cuanto a los beneficios de asistencia médica a personas médico indigentes, la cubierta del seguro médico que provee el Gobierno de Puerto Rico es una de las cubiertas más completas cuando se compara con las cubiertas de seguros médicos privados disponibles en el mercado. En estos momentos, el costo de un seguro médico individual con los beneficios de Mi Salud es de aproximadamente \$200 mensuales. Esta cantidad se estimó obteniendo una cotización con un seguro médico privado para una cubierta similar a la de Mi Salud. En este caso los seguros médicos comerciales que comparan con los beneficios de Mi Salud son los que se categorizan bajo planes de cubierta platino. Se utilizó el estimado de cotización para individuo, pareja y familiar.

En el caso del Programa de Sección 8, la mayoría de las familias o individuos que cualifican para el PAN, cualifican para este programa. A diferencia de otros programas, el disfrute de este beneficio está sujeto a la disponibilidad de vales. Para poder asignarle un valor al beneficio de Sección 8, se evaluó el alquiler equitativo del mercado (FMR, por sus siglas en inglés) que es la guía utilizada por HUD para el funcionamiento del programa y se ajustó por el número de miembros en el hogar. Este valor se estimó para poder ser incluido en la cuantificación del paquete total de beneficios. Aunque se reconoce que los beneficios de Sección 8 no son disfrutados por toda la población que cualifica, existen otros programas similares para la población de bajos ingresos como el de vivienda en residenciales públicos que cumplen con el mismo de objetivo.

Las personas que cualifican para los programas anteriormente mencionados, podrían beneficiarse también de los programas WIC y *Head Start* de tener bebés o niñas y niños menores de 5 años. La valoración de estos beneficios es difícil de realizar, ya que depende de variables que no se pueden estimar al momento porque varían dependiendo del tipo de familia.

La siguiente tabla muestra estima el valor total de las ayudas adicionales que podría recibir una persona que también cualifica para el programa TANF. Un hogar que se compone de dos personas el total de beneficios se estimó en casi \$965 mensuales. Como se indicó anteriormente, el paquete de beneficios puede resultar en una cantidad mayor debido a que los programas del WIC y *Head Start* no están incluidos en este análisis. El incluir al programa de Sección 8 en el estimado del paquete de beneficios hace que este paquete resulte más atractivo. Es decir, dicho programa podría resultar clave al momento de una persona o familia tomar la decisión de incorporarse o no a la fuerza laboral.

Estimado de Beneficios por Miembros del Hogar							
Beneficio Mensual							
Miembros en el Hogar	Departament o de la Familia	Departament o de la Vivienda	Departament o de Salud	Junta Reglamentadora de Telecomunicaciones de Puerto Rico	Subsidio de:		Total Beneficios
	PAN	Sección 8	Mi Salud	Celular	AEE	AAA	
					Electricidad	Agua	
1	\$112	\$409	\$156	\$12.75	\$8	\$7.11	\$705
2	\$216	\$409	\$312	\$12.75	\$8	\$7.11	\$965
3	\$315	\$500	\$487	\$12.75	\$8	\$7.11	\$1,329
4	\$410	\$500	\$487	\$12.75	\$8	\$7.11	\$1,424
5	\$499	\$679	\$487	\$12.75	\$8	\$7.11	\$1,692
6	\$599	\$679	\$487	\$12.75	\$8	\$7.11	\$1,792
7	\$679	\$780	\$487	\$12.75	\$8	\$7.11	\$1,973
8	\$776	\$780	\$487	\$12.75	\$8	\$7.11	\$2,070

### *Beneficios Incluyendo al TANF*

TANF es un programa que ofrece a sus participantes una ayuda económica temporera que les permita entrenarse y crear las condiciones para alcanzar la autosuficiencia económica mediante la obtención de un empleo. A diferencia de otros programas de asistencia social, el propósito de este programa es lograr que miembros de las familias participantes se incorporen a la fuerza laboral y puedan eventualmente sustentarse por sí mismos.

La tabla a continuación presenta el paquete de beneficios incluyendo los beneficios del TANF. El programa TANF clasifica las necesidades básicas de las familias en tres categorías 50%, 100% y 185%. Estas necesidades básicas están ajustadas en lo siguiente: alimentos, ropa, efectos personales, luz, agua y combustible. Este ajuste no incluye el albergue.

## Estimado de Beneficios Ajustado por la Cantidad Mensual de Beneficio del TANF según el Número de Miembros en el Hogar

	Miembros en el Hogar	PAN	TANF	Subsidio Celular	Subsidio de Agua	Subsidio de AEE	Mi Salud	Sub-total	Sección 8	Total
	Necesidades Básicas TANF 50%	1	\$112	\$83	\$12.75	\$7.11	\$8	\$156	\$379	\$409
2		\$216	\$145	\$12.75	\$7.11	\$8	\$312	\$701	\$409	\$1,110
3		\$315	\$207	\$12.75	\$7.11	\$8	\$487	\$1,036	\$500	\$1,536
4		\$410	\$269	\$12.75	\$7.11	\$8	\$487	\$1,193	\$500	\$1,693
5		\$499	\$331	\$12.75	\$7.11	\$8	\$487	\$1,344	\$679	\$2,023
6		\$599	\$393	\$12.75	\$7.11	\$8	\$487	\$1,506	\$679	\$2,185
7		\$679	\$455	\$12.75	\$7.11	\$8	\$487	\$1,648	\$780	\$2,428
8		\$776	\$517	\$12.75	\$7.11	\$8	\$487	\$1,807	\$780	\$2,587
	Miembros en el Hogar	PAN	TANF	Subsidio Celular	Subsidio de Agua	Subsidio de AEE	Mi Salud	Total Beneficio	Sección 8	Total
	Necesidades Básicas TANF 100%	1	\$112	\$166	\$12.75	\$7.11	\$8	\$156	\$462	\$409
2		\$216	\$290	\$12.75	\$7.11	\$8	\$312	\$846	\$409	\$1,255
3		\$315	\$414	\$12.75	\$7.11	\$8	\$487	\$1,243	\$500	\$1,743
4		\$410	\$538	\$12.75	\$7.11	\$8	\$487	\$1,462	\$500	\$1,962
5		\$499	\$662	\$12.75	\$7.11	\$8	\$487	\$1,675	\$679	\$2,354
6		\$599	\$786	\$12.75	\$7.11	\$8	\$487	\$1,899	\$679	\$2,578
7		\$679	\$910	\$12.75	\$7.11	\$8	\$487	\$2,103	\$780	\$2,883
8		\$776	\$1,034	\$12.75	\$7.11	\$8	\$487	\$2,324	\$780	\$3,104
	Miembros en el Hogar	PAN	TANF	Subsidio Celular	Subsidio de Agua	Subsidio de AEE	Mi Salud	Total Beneficio	Sección 8	Total
	Necesidades Básicas TANF 185%	1	\$112	\$307	\$12.75	\$7.11	\$8	\$156	\$603	\$409
2		\$216	\$537	\$12.75	\$7.11	\$8	\$312	\$1,093	\$409	\$1,502
3		\$315	\$766	\$12.75	\$7.11	\$8	\$487	\$1,595	\$500	\$2,095
4		\$410	\$995	\$12.75	\$7.11	\$8	\$487	\$1,919	\$500	\$2,419
5		\$499	\$1,225	\$12.75	\$7.11	\$8	\$487	\$2,238	\$679	\$2,917
6		\$599	\$1,454	\$12.75	\$7.11	\$8	\$487	\$2,567	\$679	\$3,246
7		\$679	\$1,684	\$12.75	\$7.11	\$8	\$487	\$2,877	\$780	\$3,657
8		\$776	\$1,913	\$12.75	\$7.11	\$8	\$487	\$3,203	\$780	\$3,983

## VI. ANÁLISIS CUANTITATIVO DE LOS BENEFICIOS DE LAS AYUDAS Y TRANSFERENCIAS DEL GOBIERNO, SALARIO MÍNIMO Y SUS REPERCUSIONES EN EL MERCADO DE TRABAJO.

Esta sección compara el valor estimado para el paquete de beneficios de ayudas económicas gubernamentales disponibles en Puerto Rico con los ingresos que un individuo generaría de trabajar al salario mínimo (\$7.25 por hora) tanto a tiempo parcial como a tiempo completo. Como se ha dicho anteriormente el estimado de paquete de beneficios, con o sin TANF y Sección 8, son algo conservadores, ya que no contienen el 100% de las ayudas que las familias podrían recibir. Las siguientes tablas muestran los resultados

### *Paquete de Beneficios versus Trabajo a Tiempo Parcial*

En la tabla 1 se presenta el paquete de beneficios sin incluir TANF ni Sección 8. Sin estos dos programas un hogar de una persona genera \$283 dólares más al mes de trabajar a tiempo parcial versus no trabajar. Sin embargo, mientras más miembros hay en el hogar, la brecha entre el salario y el valor de los beneficios gubernamentales se reduce si se mantuviera una sola persona trabajando a tiempo parcial, hasta llegar inclusive a sobrepasar los ingresos por concepto de salarios. Por ejemplo, el paquete de beneficios de ayudas para una familia de tres (3) miembros es \$251 más que el salario generado por un miembro de la familia trabajando a tiempo parcial.

**Tabla 1:**

<b>Estimado de Beneficios sin TANF ni Sección 8 comparado con los Ingresos del Salario Mínimo a Tiempo Parcial</b>			
<u>Miembros en el hogar</u>	<u>Estimado de Ayudas Económicas</u>	<u>Estimado de Salario Mínimo a Tiempo Parcial</u>	<u>Diferencia</u>
1	\$296	\$579	<b>\$283</b>
2	\$556	\$579	<b>\$23</b>
3	\$829	\$579	\$251
4	\$924	\$579	\$346
5	\$1,013	\$579	\$435
6	\$1,113	\$579	\$535
7	\$1,193	\$579	\$615
8	\$1,290	\$579	\$712

En la tabla 2 se muestra el paquete de beneficios incluyendo los programas de TANF y Sección 8. El análisis se realizó utilizando las necesidades básicas del TANF del 100%. En este caso los beneficios generados por las ayudas sobrepasan los ingresos generados por concepto de salario a tiempo parcial en todos los tamaños de familia.

**Tabla 2:**

<b>Estimado de Beneficios con TANF y Sección 8 comparado con los Ingresos del Salario Mínimo a Tiempo Parcial</b>						
<u>Miembros en el hogar</u>	<u>Estimado de Ayudas Económicas</u>				<u>Estimado de Salario Mínimo a Tiempo Parcial</u>	<u>Diferencia</u>
	<u>Ayudas Económicas</u>	<u>TANF</u>	<u>Sección 8</u>	<u>Total Ayudas Económicas</u>		
1	\$296	\$166	\$409	\$871	\$579	\$292
2	\$556	\$290	\$409	\$1,255	\$579	\$676
3	\$829	\$414	\$500	\$1,743	\$579	\$1,165
4	\$924	\$538	\$500	\$1,962	\$579	\$1,384
5	\$1,013	\$662	\$679	\$2,354	\$579	\$1,776
6	\$1,113	\$786	\$679	\$2,578	\$579	\$2,000
7	\$1,193	\$910	\$780	\$2,883	\$579	\$2,305
8	\$1,290	\$1,034	\$780	\$3,104	\$579	\$2,526

### *Paquete de Beneficios versus Trabajo a Tiempo Completo*

En el caso de tener un trabajo a tiempo completo el escenario cambia. Resulta atractivo incorporarse a la fuerza laboral, ya que el ingreso generado de un salario a tiempo completo supera el valor del paquete de beneficios, principalmente para familias pequeñas. En la tabla 1 se puede ver claramente que sin recibir las ayudas del TANF y Sección 8 un salario a tiempo completo resulta atractivo.

Tabla 1:

<b>Estimado de Beneficios sin TANF ni Sección 8 comparado con los Ingresos del Salario Mínimo a Tiempo Completo</b>			
<u>Miembros en el hogar</u>	<u>Estimado de Ayudas Económicas</u>	<u>Estimado de Salario Mínimo a Tiempo Completo</u>	<u>Diferencia</u>
1	\$296	\$1,159	\$863
2	\$556	\$1,159	\$603
3	\$829	\$1,159	\$329
4	\$924	\$1,159	\$234
5	\$1,013	\$1,159	\$145
6	\$1,113	\$1,159	\$45
7	\$1,193	\$1,159	\$35
8	\$1,290	\$1,159	\$132

Sin embargo, cuando se incorpora al análisis los beneficios del TANF y Sección 8 la situación cambia (Tabla 2). El análisis se realizó utilizando las necesidades básicas del TANF del 100%. En este caso los beneficios generados por las ayudas sobrepasan los ingresos generados por concepto de salario a tiempo completo cuando la familia alcanza los dos (2) miembros.

Tabla 2:

<b>Estimado de Beneficios con TANF y Sección 8 comparado con los Ingresos del Salario Mínimo a Tiempo Completo</b>						
<u>Miembros en el hogar</u>	<u>Estimado de Ayudas Económicas</u>			<u>Total Ayudas Económicas</u>	<u>Estimado de Salario Mínimo a Tiempo Completo</u>	
	<u>Económicas</u>	<u>TANF</u>	<u>Sección 8</u>			<u>Diferencia</u>
1	\$296	\$166	\$409	\$871	\$1,159	\$288
2	\$556	\$290	\$409	\$1,255	\$1,159	\$96
3	\$829	\$414	\$500	\$1,743	\$1,159	\$585
4	\$924	\$538	\$500	\$1,962	\$1,159	\$804
5	\$1,013	\$662	\$679	\$2,354	\$1,159	\$1,196
6	\$1,113	\$786	\$679	\$2,578	\$1,159	\$1,420
7	\$1,193	\$910	\$780	\$2,883	\$1,159	\$1,725
8	\$1,290	\$1,034	\$780	\$3,104	\$1,159	\$1,946

Los programas de ayudas económicas proveen un apoyo importante a los grupos en desventaja económica en la Isla. Las transferencias a las personas, especialmente las que provienen del Gobierno Federal, constituyen un ingreso importante para los habitantes de Puerto Rico. A pesar de que Puerto Rico no cualifica para muchos programas federales en las mismas condiciones que los cincuenta (50) estados, la alta incidencia de la pobreza en la Isla conduce a que la importancia relativa de las transferencias a las personas sea mayor en Puerto Rico que en los estados. Esto tiene una serie de implicaciones para la economía puertorriqueña.

Los programas de ayudas económicas cumplen con un propósito social y de redistribución de ingresos pero tienen repercusiones en el mercado de trabajo, ya que no incentivan a las personas a participar del mismo; al menos si su potencial de ingresos es cercano al salario mínimo. Este es uno de los factores responsables del poco dinamismo del mercado laboral puertorriqueño. La decisión de las personas de no incorporarse al mercado de trabajo en un empleo a salario mínimo o cercano al salario mínimo está muy influenciada por el alto valor relativo de los programas de asistencia pública disponibles en la Isla.

Un trabajador-consumidor racional no va a querer dedicarle tiempo al trabajo si el costo de oportunidad de trabajar es mayor o igual que el ingreso que se devengaría por las horas trabajadas. En otras palabras, si el salario disponible en el mercado es igual o menor que los beneficios que la persona podría recibir estando laboralmente inactiva, sería irracional—en el sentido económico—el conseguir y mantener un empleo.

De hecho, toda vez que el disfrute del ocio tiene un valor económico para las personas, la decisión de estar activo en el mercado de trabajo requiere que el salario disponible sea superior por un margen razonable al conjunto de pagos de transferencia que se pueden recibir sin trabajar. El problema que esto presenta en el caso de Puerto Rico es que para la mayor parte de los trabajadores potenciales el salario disponible en el mercado es el salario mínimo, y éste no está muy lejos del valor total del “paquete” de beneficios que muchas personas pueden obtener manteniéndose laboralmente inactivos.

Un análisis de este problema lo realizó en el año 2006 el Centro para la Nueva Economía (CNE) y el Brookings Institution.<sup>1</sup> Utilizando el salario mínimo y los programas de beneficencia pública

<sup>1</sup> Gary Burtless y Orlando Sotomayor, “Labor Supply and Public Transfers,” capítulo 3 de *The Economy of Puerto Rico: Restoring Growth*, Brookings Institution y Centro para la Nueva Economía, Washington, D.C., 2006.

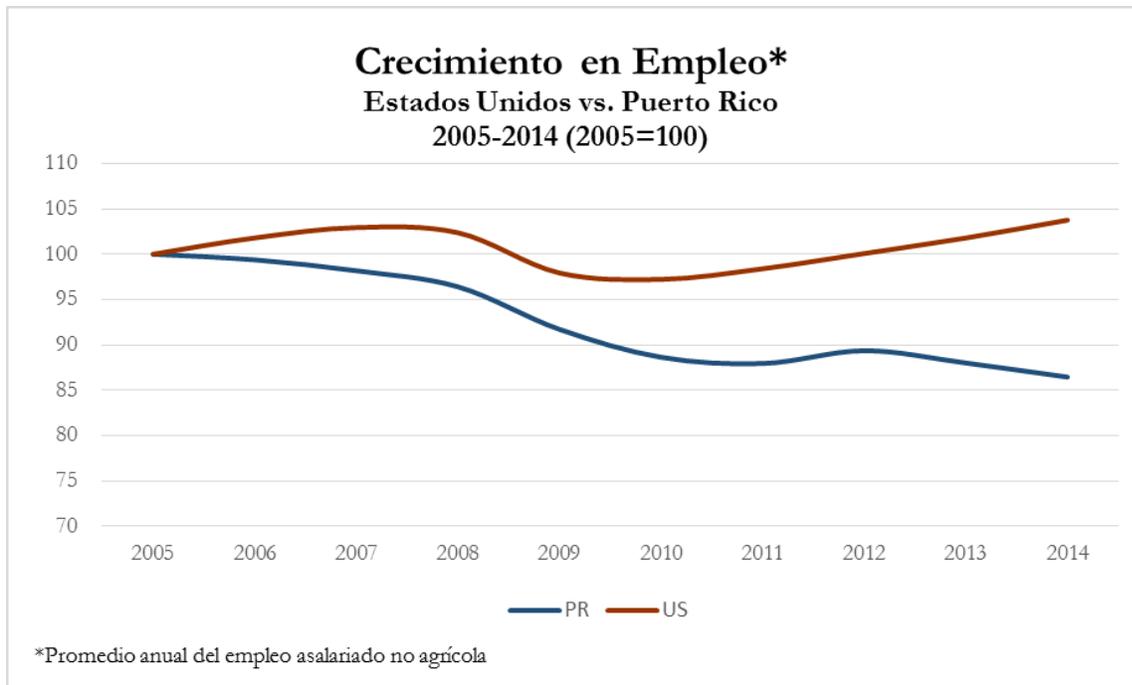
disponibles en el año 2003, los autores calcularon el beneficio neto mensual para diferentes tipos de consumidores-trabajadores de trabajar versus no trabajar y recibir beneficios.

La posibilidad de trabajar a salario mínimo, incluso tratándose de dos salarios mínimos en la familia, no es atractiva, ya que el beneficio mensual neto de trabajar es muy pequeño suponiendo, como es el caso, que al trabajar a tiempo completo (40 horas a la semana) se pierde la totalidad o casi la totalidad de los beneficios disponibles de los programas de transferencias. Esto debido a que los criterios de elegibilidad de cada programa estatal y federal están sujetos a criterios de ingresos. Además existen costos o gastos relacionados al trabajo tales como ropa de trabajo, almuerzos y transportación que no se están tomando en consideración en el análisis.

Es indiscutible que el valor de los beneficios que reciben las personas y familias en programas de ayudas es cercano y, como se pudo apreciar, en algunos casos sobrepasa lo que éstos podrían generar trabajando a salario mínimo. Esta situación hace que muchas familias decidan no trabajar. Además, la difícil situación económica que atraviesa Puerto Rico presenta un panorama de búsqueda de empleo no muy alentador.

Otra consecuencia importante de toda esta situación es el número indeterminado de familias que están recurriendo a trabajos en la economía informal para no perder los beneficios de las ayudas del gobierno. Esto es una situación preocupante que tiene repercusiones en la asignación de los recursos y que puede dejar desprovistas a familias con necesidades más apremiantes.

Al observar el crecimiento en empleo en los últimos años en Estados Unidos se observa un crecimiento moderado con muestras de recuperación. Sin embargo, el panorama de empleo en Puerto Rico luce preocupante.



## VII. CONCLUSIONES Y RECOMENDACIONES DE POLÍTICA PÚBLICA QUE AYUDEN A SUBSANAR LAS DEFICIENCIAS O LAS BRECHAS

Una de las conclusiones más importantes de este informe es que el valor total de los beneficios que reciben las familias bajo programas de ayuda y transferencias del gobierno no incentiva el que estas personas se inserten en la fuerza laboral. Como se expuso, el valor de estos beneficios es cercano, y en algunos casos, sobrepasa los ingresos por concepto de salario si se trabajara a salario mínimo. En el caso de madres o padres solteros la decisión de ingresar a la fuerza laboral se hace más difícil, ya que éstos tendrían que pagar por el cuidado de sus hijos.

La situación antes expuesta no sólo tiene repercusiones en la economía puertorriqueña y en el mercado de trabajo, sino que también incide de manera negativa en los objetivos del Programa TANF. Como se había planteado, el propósito principal del programa es precisamente el que las personas participantes se incorporen a la fuerza laboral y puedan eventualmente sustentarse por sí mismas.

El gobierno de Puerto Rico debe de idear una política pública que incentive el trabajo y que cree las condiciones para fortalecer y diversificar la oferta de trabajo a tiempo completo. En el año 2006, se creó una política pública de dar un crédito por trabajo para aquellas personas que devengaban ingresos de hasta \$10 mil anuales. Este crédito se eliminó como parte de la reestructuración fiscal del Gobierno de Puerto Rico en el 2014.

Ha estado bajo discusión la creación de un nuevo crédito por trabajo para familias con hijos que devengan un ingreso entre \$7,500 a \$25,000. En este caso estas familias cumplen con sus responsabilidades contributivas pero no pueden beneficiarse de ningún programa de beneficencia ya que sus ingresos son muy altos para cualificar para ciertos programas. Este tipo de ajuste es una forma de incentivar el trabajo formal.

Otros programas como los servicios de Head Start (HS) y Early Head Start (EHS) ayudan a que una madre pueda trabajar a tiempo completo. Como parte de este esfuerzo se propone alterar los mecanismos de ofrecer el servicio para ampliar la cobertura con el mismo presupuesto. Según establece el “Head Start Program Performance Standards” (45 CFR 1301-1311), las clases en estos centros deben llevarse a cabo con un máximo de seis (6) horas diarias pero establece como cuatro (4) horas el tiempo óptimo de aprovechamiento de las mismas.

De acuerdo a los hallazgos y conclusiones de este estudio, *Advantage* presenta las siguientes recomendaciones de política pública:

- Re-evaluar y re-diseñar el programa TANF
- Reincorporar el crédito por trabajo
- Evaluar la opción de que más centros HS operen en dos turnos de cuatro (4) horas en lugar de seis (6) en turnos de mañana y de tarde. (Actualmente hay más de cuarenta (40) centros trabajando en este tipo de arreglo).
- El servicio de día completo debe dar prioridad a familias que tengan necesidades de empleo y/o trabajo, además de dar prioridad para selección de turno (mañana/tarde) a dichas familias.
- Evaluar la posibilidad de que las familias paguen por horas de cuidado adicionales a las horas de HS para completar el tiempo de un día completo de servicio.
- Evaluar la posibilidad de proveer servicios complementarios a través de “vouchers” del programa “Child Care” en la medida en que hayan los recursos en este otro programa.
- Coordinación entre Administración para el Cuidado y Desarrollo Integral de la Niñez (ACUDEN) y el Departamento de Educación para compartir facilidades y servicios entre el programa HS y Pre-K. Entre HS y Pre-K se puede cubrir el día entero.

## ANEJOS

## Alquiler Equitativo del Mercado

## Final FY2015 Puerto Rico FMR Local Area Summary

Municipio	Nombre del Area	"Efficiency"	Una	Dos	Tres	Cuatro	"FMR"
			Habitación	Habitaciones	Habitaciones	Habitaciones	Percentila
Adjuntas Municipio, PR	Puerto Rico HUD Nonmetro Area	\$319	\$327	\$405	\$527	\$615	40
Aguada Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Aguadilla Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Aguas Buenas Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Aibonito Municipio, PR	<i>Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area</i>	\$314	\$350	\$420	\$519	\$570	40
Añasco Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Arecibo Municipio, PR	<i>Arecibo, PR HUD Metro FMR Area</i>	\$370	\$390	\$468	\$647	\$660	40
Arroyo Municipio, PR	<i>Guayama, PR MSA</i>	\$331	\$412	\$558	\$691	\$773	40
Barceloneta Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Barranquitas Municipio, PR	<i>Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area</i>	\$314	\$350	\$420	\$519	\$570	40
Bayamón Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Cabo Rojo Municipio, PR	<i>San Germán-Cabo Rojo, PR MSA</i>	\$335	\$354	\$425	\$599	\$718	40
Caguas Municipio, PR	<i>Caguas, PR HUD Metro FMR Area</i>	\$415	\$423	\$550	\$799	\$901	40
Camuy Municipio, PR	<i>Arecibo, PR HUD Metro FMR Area</i>	\$370	\$390	\$468	\$647	\$660	40
Canóvanas Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Carolina Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Cataño Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Cayey Municipio, PR	<i>Caguas, PR HUD Metro FMR Area</i>	\$415	\$423	\$550	\$799	\$901	40
Ceiba Municipio, PR	<i>Fajardo, PR MSA</i>	\$432	\$455	\$545	\$792	\$850	40
Ciales Municipio, PR	<i>Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area</i>	\$314	\$350	\$420	\$519	\$570	40
Cidra Municipio, PR	<i>Caguas, PR HUD Metro FMR Area</i>	\$415	\$423	\$550	\$799	\$901	40
Coamo Municipio, PR	Puerto Rico HUD Nonmetro Area	\$319	\$327	\$405	\$527	\$615	40
Comerio Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Corozal Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Culebra Municipio, PR	Puerto Rico HUD Nonmetro Area	\$319	\$327	\$405	\$527	\$615	40
Dorado Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Fajardo Municipio, PR	<i>Fajardo, PR MSA</i>	\$432	\$455	\$545	\$792	\$850	40

Municipio	Nombre del Area	"Efficiency"	<u>Una</u> <u>Habitación</u>	<u>Dos</u> <u>Habitaciones</u>	<u>Tres</u> <u>Habitaciones</u>	<u>Cuatro</u> <u>Habitaciones</u>	"FMR" Percentila
Florida Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Guánica Municipio, PR	<i>Yauco, PR MSA</i>	\$330	\$349	\$419	\$560	\$730	40
Guayama Municipio, PR	<i>Guayama, PR MSA</i>	\$331	\$412	\$558	\$691	\$773	40
Guayanilla Municipio, PR	<i>Yauco, PR MSA</i>	\$330	\$349	\$419	\$560	\$730	40
Guaynabo Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Gurabo Municipio, PR	<i>Caguas, PR HUD Metro FMR Area</i>	\$415	\$423	\$550	\$799	\$901	40
Hatillo Municipio, PR	<i>Arecibo, PR HUD Metro FMR Area</i>	\$370	\$390	\$468	\$647	\$660	40
Hormigueros Municipio, PR	<i>Mayagüez, PR MSA</i>	\$375	\$396	\$475	\$630	\$798	40
Humacao Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Isabela Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Jayuya Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
Juana Díaz Municipio, PR	<i>Ponce, PR MSA</i>	\$400	\$422	\$506	\$734	\$884	40
Juncos Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Lajas Municipio, PR	<i>San Germán-Cabo Rojo, PR MSA</i>	\$335	\$354	\$425	\$599	\$718	40
Lares Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Las Marías Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
Las Piedras Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Loíza Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Luquillo Municipio, PR	<i>Fajardo, PR MSA</i>	\$432	\$455	\$545	\$792	\$850	40
Manatí Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Maricao Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
Maunabo Municipio, PR	<i>Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area</i>	\$314	\$350	\$420	\$519	\$570	40
Mayagüez Municipio, PR	<i>Mayagüez, PR MSA</i>	\$375	\$396	\$475	\$630	\$798	40
Moca Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Morovis Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Naguabo Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Naranjito Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Orocovis Municipio, PR	<i>Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area</i>	\$314	\$350	\$420	\$519	\$570	40
Patillas Municipio, PR	<i>Guayama, PR MSA</i>	\$331	\$412	\$558	\$691	\$773	40
Peñuelas Municipio, PR	<i>Yauco, PR MSA</i>	\$330	\$349	\$419	\$560	\$730	40
Ponce Municipio, PR	<i>Ponce, PR MSA</i>	\$400	\$422	\$506	\$734	\$884	40

Municipio	Nombre del Area	"Efficiency"	<u>Una</u> <u>Habitación</u>	<u>Dos</u> <u>Habitaciones</u>	<u>Tres</u> <u>Habitaciones</u>	<u>Cuatro</u> <u>Habitaciones</u>	"FMR" Percentila
Quebradillas Municipio, PR	<i>Barranquitas-Aibonito-Quebradillas, PR HUD Metro FMR Area</i>	\$314	\$350	\$420	\$519	\$570	40
Rincón Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Río Grande Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Sabana Grande Municipio, PR	<i>San Germán-Cabo Rojo, PR MSA</i>	\$335	\$354	\$425	\$599	\$718	40
Salinas Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
San Germán Municipio, PR	<i>San Germán-Cabo Rojo, PR MSA</i>	\$335	\$354	\$425	\$599	\$718	40
San Juan Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
San Lorenzo Municipio, PR	<i>Caguas, PR HUD Metro FMR Area</i>	\$415	\$423	\$550	\$799	\$901	40
San Sebastián Municipio, PR	<i>Aguadilla-Isabela-San Sebastián, PR MSA</i>	\$420	\$443	\$530	\$683	\$725	40
Santa Isabel Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
Toa Alta Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Toa Baja Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Trujillo Alto Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Utua Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
Vega Alta Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Vega Baja Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Vieques Municipio, PR	<i>Puerto Rico HUD Nonmetro Area</i>	\$319	\$327	\$405	\$527	\$615	40
Villalba Municipio, PR	<i>Ponce, PR MSA</i>	\$400	\$422	\$506	\$734	\$884	40
Yabucoa Municipio, PR	<i>San Juan-Guaynabo, PR HUD Metro FMR Area</i>	\$464	\$502	\$601	\$810	\$975	40
Yauco Municipio, PR	<i>Yauco, PR MSA</i>	\$330	\$349	\$419	\$560	\$730	40

Fuente: "U.S. Department of Housing and Urban Development"

**Comments on ABC Consulting study for HSRPPR.  
“Beneficios de las Personas Elegibles al Tanf Vs. Escenario de Salario Mínimo Federal”**

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This document includes some comments and reactions to **ABC Consulting Study for HSRPPR:  
“Beneficios de las Personas Elegibles al Tanf Vs. Escenario de Salario Mínimo Federal.”**

This study is divided into seven sections that cover three main topics: the first is a demographic analysis of the low-income population using IPUMS data from the Puerto Rico Community Survey (PRCS) for 2013. More details need to be presented as to exactly what file was used (1yr, 3yr or 5ys) and the actual years covered. The report mentions that the variables analyzed include: *total family income, number of own family members in the household, marital status, any health insurance coverage, and number of own children in the household.*

The demographic section starts by showing population change for the major age groups and then proceeds to prepare a table of family income by number of household members. While this is interesting information, it is hard for the reader to get a clear sense of the proportion of the population below poverty by family size and that critical information can be presented in a separate table or highlighted in the present table. There are too many numbers and the table is hard to follow.

At the top of page 7 of the report the authors highlight that there are over 58,000 persons that qualify for health subsidy but do not appear to be receiving the health plan (Mi Salud) because they did not have health insurance. This is an important point to consider later on when making estimates of the cost\benefit of participating in programs compared to working. It is important to know the proportion of the population that is eligible for various subsidies (the denominator) compared to the proportion of the population that actually receives each of the subsidies (the numerator) in order to produce accurate estimates of program participation and an adequate cost-benefit analysis. The paper appears to include evidence that not all those are eligible actually participate in every program but the cost-benefit analysis does not take this probability of program use and participation into account.

The tables on family income by household members by marital status are interesting but the information needs to be summarized in a way that is easier for the reader to understand and follow the trends in the data from table to table. What is the relationship between marital status, number of household members, and income? How do these tables help us understand the eligible populations for the various programs? It is not clear from looking at all these panels what that relationship is between marital status, number of household members, and household income and that should be clarified.

The data seems to suggest that there are close to 1 million persons married and about 1.7 million that are single. At the bottom of page 9 the authors argue that 48% of the 1.7 million single persons in

Puerto Rico are women and they suggest that about 207,000 received incomes of less than \$5,000 a year. These are persons in extreme poverty that presumably qualify for various programs but that is not stated clearly in the report. **The authors then proceed to show a table with the number of single women by number of own children in the household and find that of the 867,322 single women about 742,620 do not have any own children. This suggests that according to the author's data 85.6% of single women in Puerto Rico not have any own children in the household.** This is quite relevant for understanding the prevalence of single motherhood in Puerto Rico and for understanding the proportion of the population that will be eligible for TANF and other related programs mentioned in the report that focus on families with young children (such as WIC and Head Start). Again, there is a need to be clear on what proportion of the population of single women are actually eligible for the various subsidies and programs that are mentioned in the report and what proportion actually receive them.

It is critical to stress that while the demographic narrative is interesting, it is somewhat confusing to try to understand what percent of the population is eligible for the different types of programs based on their characteristics and, more importantly, what proportion of the eligible population is actually enrolled and, in fact, receiving subsidies from the various programs. Information on actual take-up rates and program participation is critical to understanding the actual trade-offs between “welfare participation” and work.

Section III of the report provides a detailed analysis of main eligibility criteria for the various programs including PAN, section 8, WIC, TANF, Mi Salud (Health Plan), telephone, water, and electricity subsidies. The data presented in the section discusses some basic eligibility criteria and includes tables on the various income thresholds for the different programs and estimates of what look like the maximum payments allowed for recipients in each of the programs. The TANF benefit estimates on page 14, for example, presents estimates of payments under three different need scenarios and family sizes. This section does not include information on the actual proportion of the population that is eligible for each subsidy and the proportion of the population that actually receives each subsidy.

It is important to note that eligibility for their PAN program and for the health program (Mi Salud) allow for some family income which needs to be taken into account when evaluating the cost\benefits of participating in the programs versus working. It is not an “all or nothing” proposition as many families that receive some work income are also eligible for PAN and Mi Salud. Some portion of the subsidy is retained even if some income is generated and the report does not acknowledge or incorporate that.

The next section IV of the report focuses on estimating how much a minimum wage worker in Puerto Rico would earn under a part-time scenario and a full-time scenario. This section is relatively clear but, again, the earnings estimates from work do not incorporate the fact that some subsidies remain even after some work income is generated. There are households where all the income comes from aid, there are households where all the income comes from work and related (and receive no subsidies), and there are households that have work related income **and also receive some subsidies** and the estimates in this report, particularly the table on page 25, do not account for this.

Section V of the report tries to engage in a quantitative analysis of benefits compared to the potential income received from work.

Table of the top of page 21 presents some estimates of the monthly benefit by household size of the family receiving subsidies from the PAN program, section 8, the health subsidy program (Mi Salud), telephone, electricity, and water subsidy. It presents the total benefits estimated for households with one and up to 8 persons.

Section VI presents the quantitative analysis comparing a family working full or part-time at the minimum wage of \$7.25 per hour. The authors argue that their estimate of subsidies received is a conservative estimate because they do not include all of the programs that a family could receive and particularly mentions the WIC program and the Pell grants. These two programs are received by families and individuals with particular characteristics and under particular circumstances including pregnant women (or with young children) or college students. Rather than speculating that some families could also receive these subsidies, the study could have provided an estimate of the proportion of the population in each of those two categories (low income college students and women with children under 1, 2 or 3 years of age) and included those numbers in the estimates for the relevant households. It is also debatable whether the Pell Grant program can be considered “welfare” in any meaningful sense.

The first scenario that the paper presents is a scenario where the person receives some subsidies but not the TANF program or section 8 and compares estimated subsidies with earnings from part-time work. It finds that for one and two person households working part-time yields more than relying on subsidies.

Adding the TANF subsidies (as estimated in the paper) and section 8 subsidies in table 2 on page 24 the authors suggest that there is an advantage of receiving all subsidies over working part-time. Again, these estimates do not account for the fact that some subsidies remain with part-time work.

Comparing subsidies without the TANF program and section 8 compared to full-time earnings in table 1 on page 25 suggest that full-time earnings are a considerable advantage over partial subsidies.

The key table in the paper is table 2 on page 25 that compares total subsidies, including what this study estimates of the value of TANF and section 8 benefits, compared to the estimates of full-time earnings for households of various sizes.

The table would appear to show that a family with one member working full-time would earn \$1,159 and a family of three persons would also earn \$1,159 and if a family of three received all of the subsidies including TANF and section 8 they could receive \$1,743 per month in subsidies and benefits and that appears to be an advantage of \$585 over full time minimum wage work. These were the numbers that were used in the “Krueger Report” to argue that there was an “advantage of welfare over work.”

## Beneficios de Personas Elegibles al TANF vs. el Salario mí...

tiempo completo cuando la familia alcanza los dos (2) miembros.

Tabla 2:

Miembros en el hogar	Estimado de Ayudas			Total Ayudas Económicas	Estimado de Salario Mínimo a Tiempo Completo	Diferencia
	Económicas	TANF	Sección 8			
1	\$296	\$166	\$409	\$871	\$1,159	\$288
2	\$556	\$290	\$409	\$1,255	\$1,159	\$96
3	\$829	\$414	\$500	\$1,743	\$1,159	\$585
4	\$924	\$538	\$500	\$1,962	\$1,159	\$804
5	\$1,013	\$662	\$679	\$2,354	\$1,159	\$1,196
6	\$1,113	\$786	\$679	\$2,578	\$1,159	\$1,420
7	\$1,193	\$910	\$780	\$2,883	\$1,159	\$1,725
8	\$1,290	\$1,034	\$780	\$3,104	\$1,159	\$1,946



PUERTO RICO – A WAY FORWARD

- Workers are disinclined to take up jobs because the welfare system provides generous benefits that often exceed what minimum wage employment yields; one estimate shows that a household of three eligible for food stamps, AFDC, Medicaid and utilities subsidies could receive \$1,743 per month – as compared to a minimum wage earner's take-home earnings of \$1,159.

The result of all of the above is massive underutilization of labor, foregone output, and waning competitiveness.

There are several challenges with the numbers in this table 2 on page 25 of the ABC Report.

- The table assumes that all households use all subsidies. Data presented in report shows not all eligible persons use health (Mi Salud) or housing subsidies, for example. The report needs to factor the probability of participation and take-up rates into the estimates of the value of subsidies over work. Does the report include any data on what proportion of households of different sizes that actually receive all the mentioned subsidies?
- The estimates in the table assume everyone gets the maximum potential payment. This is in theory and we need to examine actual program data to see what are the actual benefit levels by household size. Very few cases get maximum potential benefit in all the programs because funds are capped.
- Assumes a household labor supply of one person that is the same (and unaffected) by household size or the age\gender composition of the household. Larger households, depending on the age of members, are likely to have higher labor supply and it is unreasonable to assume that a household with 8 members will have the same labor supply as a household with one member. Estimating earning for just one member in large households lowers the estimates of earned income and increases the relative value of the subsidies. The report should look at actual household composition, household size, and labor supply data in order to make more realistic estimates of potential earnings for households of different sizes and composition.

4. The estimates do not account for fact that many households would still be eligible for Mi Salud and PAN subsidies if earning at minimum wage or earning below poverty level. The estimates assume either all subsidy income or all work income but the authors do not contemplate or analyze the cost\benefit calculation for households that receive some subsidies and also generate some income.
5. The report does not provide nuanced estimates of cost\benefit analysis for households with different composition and various mixes of adults and children. A household of three persons could have one adult and two children, two adults and one child, or three adults, and the eligibility for benefits and subsidies will be different for different types of households. The report does not take this into account.

Below, I present two corrections to the estimates presented in the report.

1. First, I corrected the numbers for TANF payments based on actual TANF Data for June 2015 on average benefit levels by household size. The column labeled "TANF real" is the actual average amount of TANF benefits by household size.
2. Second, I make some adjustments to the labor supply. Households with up to three members are left with one worker. Households with 4 members have a 1.25 labor supply. Households with 5 and 6 members have 1.5 labor supply, and households with 7 and 8 members have labor supply of 2.0. Changes in labor supply assumptions for larger households follow empirical trends in labor supply by household size.
3. I am so added data on TANF participation from the case load data for June 2015. In June 2015, there were 65,733 TANF cases out of over 1.6 million persons in poverty (estimated using 2013 PRCS data).

## Adjusted TANF Payment and Work Supply Estimates

TANF Data  
June 2015

Family Size	Ayudas	TANF	house	total original	tanf real	adi total	worker	orig	adi	adi worker	adi diff	% of cases	cases TANF	Cumulative Percent
1	\$ 296	\$ 166	\$ 409	\$ 871	\$ 67	\$ 772	\$ 1,159	\$ (288)	\$ (387)	\$ 1,159	\$ (387)	54.2	35657	54.2
2	\$ 556	\$ 290	\$ 409	\$ 1,255	\$ 139	\$ 1,104	\$ 1,159	\$ 96	\$ (55)	\$ 1,159	\$ (55)	16.8	11045	71.0
3	\$ 829	\$ 414	\$ 500	\$ 1,743	\$ 210	\$ 1,539	\$ 1,159	\$ 584	\$ 380	\$ 1,159	\$ 380	16.5	10876	87.6
4	\$ 924	\$ 538	\$ 500	\$ 1,962	\$ 267	\$ 1,691	\$ 1,159	\$ 803	\$ 532	\$ 1,449	\$ 242	8.9	5852	96.5
5	\$ 1,013	\$ 662	\$ 679	\$ 2,354	\$ 320	\$ 2,012	\$ 1,159	\$ 1,195	\$ 853	\$ 1,739	\$ 273	2.8	1833	99.3
6	\$ 1,113	\$ 786	\$ 679	\$ 2,578	\$ 378	\$ 2,170	\$ 1,159	\$ 1,419	\$ 1,011	\$ 1,739	\$ 431	.6	378	99.8
7	\$ 1,193	\$ 910	\$ 780	\$ 2,883	\$ 374	\$ 2,347	\$ 1,159	\$ 1,724	\$ 1,188	\$ 2,318	\$ 29	.1	84	100.0
8	\$ 1,290	\$ 1,034	\$ 780	\$ 3,104	\$ 617	\$ 2,687	\$ 1,159	\$ 1,945	\$ 1,528	\$ 2,318	\$ 369	.0	8	100.0
													65733	

↑ Adjusted TANF
↑ Adjusted work supply
↑ Adjusted difference

8/13/2015

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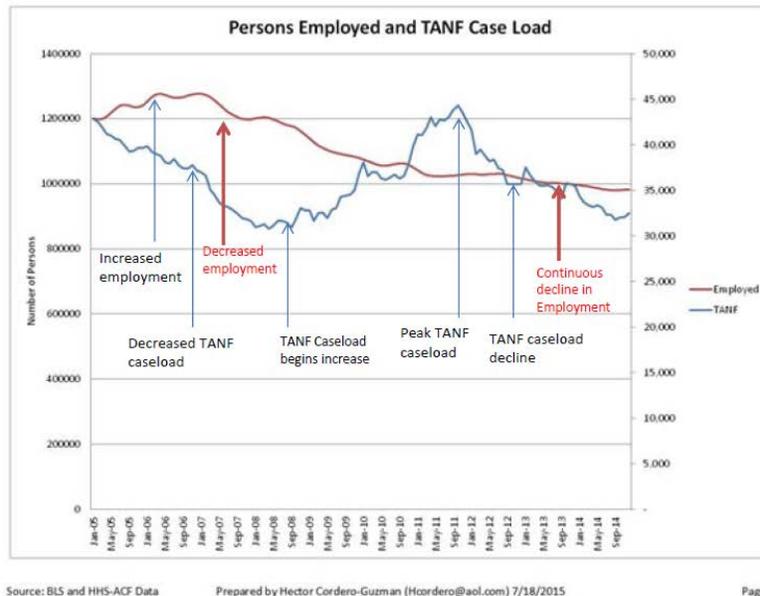
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- Making adjustments using actual TANF benefit amounts and modifying the labor supply estimates for larger households reduces the purported advantages of “welfare” (subsidies) over work significantly. It is also important to keep in mind that not all those eligible receive aid and that not all aid ends with paid work.
- Data shows 71% of cases are 1 or 2 person households (where the economic advantage of work over program benefits are largest).
- 16.7% of all TANF cases (or close to 10,876 cases) are in 3 person households where there is presumably some advantage of program participation over work.
- For discussion purposes, 3 person households are assumed to include one female adult and two minor children. For those limited number of households, there may be a small advantage of program participation over work. There should be discussion about the costs and desirability, from a social and public policy perspective, of reducing benefits for low income women with small children.
- If we assume a 3 person household with two working adults and one child, the advantages of work over welfare are clear [ $\$1,159 \times 2 = \$2318$  compared to between  $\$1,539$  (my estimate) and  $\$1,743$  (the report’s estimate) of the value of benefits].
- The revised data in the report, particularly when compared to the actual case-load data by household size, suggest that for 71% of TANF cases the value of benefits and subsidies is lower than what they could receive from work. For close to 27% of TANF cases in households between 3-6 members there could be (assuming the household can get all subsidies) some advantage of

the value of subsidies over full time minimum wage work. Note that this includes less than 20,000 persons out of an estimated poverty population of 1.6 million persons.

Some additional observations on the relationship between TANF caseload and employment in Puerto Rico:

- Looking at the historical trend of employment levels and TANF caseloads in Puerto Rico helps clarify the relationship between employment and TANF participation.
- The data show that as employment grew, TANF participation declined but about a year after employment started to collapse there was an increase in TANF use until the rate of employment decline leveled off--and time limits started to kick in--starting a reduction in the TANF case load.
- The timing of the data is clear that changes in the TANF caseload follow changes in employment and not the other way around. Declines in employment drive TANF use and it is clear that TANF use is not what drives employment levels in Puerto Rico.



8/13/2015

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The **ABC Consulting report: “Beneficios de las Personas Elegibles al Tanf Vs. Escenario de Salario Mínimo Federal”** concludes with a series of recommendations. My sense is that the comments in the first two paragraphs of the recommendations are not sustained by the data. The employment collapse in Puerto Rico is not due to TANF or welfare programs and there is abundant labor supply and people willing to work in Puerto Rico with an unemployment rate consistently over 10 percent and over 100,000 people looking for work. As was stated, the employment pattern in the table above is not explained by patters of use of the TANF program.

The third and fourth paragraphs of the recommendations on a work credit through the tax code seem sensible as does the recommendation that the head start program adjust to work schedules.

The list of recommendations offered on TANF about re-design are not clearly spelled out and the reader has no idea what the authors mean by 'Re-evaluate and re-design the TANF program.' In what ways? How? Exactly why?

Many of the recommendations focus on Head Start which is not a program that was analyzed in the report. It is not clear where many of these recommendations come from and what they have to do with the materials presented in the report.

In sum, this report is interesting but has a number of challenges that compromise its conclusions:

1. The demographic analysis is confusing and limited.
2. It does not present precise estimates and information on the size and composition eligible populations by program including TANF, the PAN program, section 8, the health subsidy program (Mi Salud), telephone, electricity, and water subsidy.
3. It does not present information on take-up rates and access to the various programs and subsidies [including TANF, the PAN program, section 8, the health subsidy program (Mi Salud), telephone, electricity, and water subsidy] and the proportion of eligible persons that actually receive each subsidy. In fact, the only table that helps us understand eligibility and access is on health insurance (p.7) and it provides evidence that not all eligible persons receive the health care subsidy (Mi Salud).
4. The report does not distinguish between the labor supply of men and the labor supply of women and how they are affected by access to subsidies and household composition and sizes. The report also does not consider how disability status impacts both program participation (particularly in TANF) and work status.
5. Some of the subsidy estimates included and used in the report are theoretical and therefore inflated and not derived from actual program data. Actual TANF program data shows that average TANF payments are lower than those used in this report.

The study provides a lot of valuable information and a very useful framework that should be discussed and can be revised, updated, and improved but, as is, the report is fine for academic discussion but without an analysis of the actual population eligible and participating in the various programs and subsidies considered, and without more accurate estimates of the size and availability of the subsidies to the actual population, it is of limited use and applicability for public policy making.

***Disclaimer***

The views expressed in this website do not necessarily reflect the views or policies of the Office of Planning, Research and Evaluation, the Administration for Children and Families, or the U.S. Department of Health and Human Services.

# **Congressional Task Force on Economic Growth in Puerto Rico**

**Report to the House and Senate**



**114<sup>th</sup> Congress**

*December 20, 2016*

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**Congressional Task Force on Economic Growth in Puerto Rico**  
**Report to the House and Senate**

**Introduction**

On June 30, 2016, the Puerto Rico Oversight, Management, and Economic Stability Act, or “PROMESA,” was enacted into law as [Public Law 114-187](#). Section 409 of PROMESA established an eight-member “Congressional Task Force on Economic Growth in Puerto Rico” (“Task Force”). In July 2016, in accordance with Section 409(b), two members of the Task Force were appointed by House Speaker Paul Ryan, two members were appointed by House Minority Leader Nancy Pelosi, two members were appointed by Senate Majority Leader Mitch McConnell, and two members were appointed by Senate Minority Leader Harry Reid.

The members appointed are as follows:

- Representative Sean Duffy (R-Wisconsin), appointed by House Speaker Paul Ryan;
- Representative Tom MacArthur (R-New Jersey), appointed by House Speaker Paul Ryan;
- Resident Commissioner Pedro Pierluisi (D-Puerto Rico), appointed by House Minority Leader Nancy Pelosi;
- Representative Nydia Velázquez (D-New York), appointed by House Minority Leader Nancy Pelosi;
- Senator Orrin Hatch (R-Utah), appointed by Senate Majority Leader Mitch McConnell;
- Senator Marco Rubio (R-Florida), appointed by Senate Majority Leader Mitch McConnell;
- Senator Robert Menendez (D-New Jersey), appointed by Senate Minority Leader Harry Reid; and
- Senator Bill Nelson (D-Florida), appointed by Senate Minority Leader Harry Reid.

Pursuant to Section 409(d), Speaker Ryan designated Senator Hatch to serve as chairman of the Task Force.

Section 409(f) required the Task Force to provide a “status update” to the House and Senate between September 1, 2016 and September 15, 2016, containing “information the Task Force has collected” and “a discussion on matters the chairman of the Task Force deems urgent for consideration by Congress.” On September 15<sup>th</sup>, the Task Force published this status update in both [English](#) and [Spanish](#).

Section 409(g) requires the Task Force to produce a report, by December 31, 2016, regarding:

- “(1) impediments in current Federal law and programs to economic growth in Puerto Rico including equitable access to Federal health care programs;

(2) recommended changes to Federal law and programs that, if adopted, would serve to spur sustainable long-term economic growth, job creation, reduce child poverty, and attract investment in Puerto Rico;

(3) the economic effect of Administrative Order No. 346 of the Department of Health of the Commonwealth of Puerto Rico (relating to natural products, natural supplements, and dietary supplements) or any successor or substantially similar order, rule, or guidance of the Commonwealth of Puerto Rico; and

(4) additional information the Task Force deems appropriate.”

This document is the report mandated by Section 409(g). Having issued this report, the Task Force now terminates, consistent with Section 409(l).

## 1. Sources of Information

To prepare this report, the Task Force obtained information from various sources.

First, on August 4, 2016, the Task Force issued a [press release](#) announcing the creation of an email portal and encouraged stakeholders to submit their recommendations to this portal. The Task Force initially announced a deadline of September 2<sup>nd</sup> for submissions to the portal. However, on September 6<sup>th</sup>, the Task Force issued a [press release](#) extending the deadline until October 14<sup>th</sup> in order to ensure that stakeholders had sufficient opportunity to provide input.

The Task Force received approximately 450 submissions via the email portal. **Appendix 1** of this report contains an alphabetized table that lists the individuals and organizations that made written submissions, including hyperlinks to each submission and any attachments. Submissions made after the October 14<sup>th</sup> deadline are included in the table, but marked as late.

The Task Force is grateful to the individuals and organizations who took time to provide submissions to the email portal, as well as to those who visited Capitol Hill—many of them traveling from Puerto Rico—to expand upon their submission. It is clear that there are many people who care deeply about Puerto Rico, who want the island to prosper, and who have thoughtful suggestions for how it can overcome its challenges and reach its potential. In preparing this report, and crafting its recommendations, the Task Force was guided by its own appreciation for Puerto Rico and desire to see it succeed.

The Task Force does note that many submissions to the email portal offer recommendations that are local rather than federal in nature, and would therefore be more properly addressed to—and

by—the government of Puerto Rico than to—and by—Congress or federal executive branch agencies. Accordingly, the Task Force recommends that Puerto Rico’s elected and appointed leaders, as well as the members and staff of the Financial Oversight and Management Board (“Oversight Board”) established by Section 101 of PROMESA, carefully review the submissions in Appendix 1.

Second, the Task Force organized a series of formal staff-level briefings with federal agencies. Here is a list of those briefings:

- August 12: Federal Reserve Bank of New York
- September 20: U.S. Small Business Administration
- September 30: U.S. Department of Energy
- October 4: Community Development Financial Institutions Fund (U.S. Department of the Treasury)
- October 7: U.S. Department of Health and Human Services
- October 11: U.S. Department of the Treasury
- October 14: U.S. Environmental Protection Agency
- October 21: U.S. Census Bureau (U.S. Department of Commerce), Bureau of Labor Statistics (U.S. Department of Labor), and National Agricultural Statistics Service (U.S. Department of Agriculture)
- October 28: Bureau of Economic Analysis (U.S. Department of Commerce), Economic Development Administration (U.S. Department of Commerce), International Trade Administration (U.S. Department of Commerce), and Minority Business Development Agency (U.S. Department of Commerce)

Third, the Task Force consulted with non-partisan congressional support organizations. Specifically, it consulted with analysts at the Congressional Research Service (CRS) about a wide range of federal policy matters pertaining to Puerto Rico, and with analysts at the Congressional Budget Office (CBO) and the Joint Committee on Taxation (JCT) about the budgetary impact of spending and revenue proposals related to Puerto Rico. The Task Force also reviewed reports written by CRS, JCT, and the U.S. Government Accountability Office (GAO) regarding Puerto Rico. Since CRS does not release its reports to the public, the Task Force exercised its right to make the relevant CRS products public, and has linked to these products in this report.

Fourth, Section 409(j) of PROMESA required the Task Force to consult with the Puerto Rico Legislative Assembly, the Puerto Rico Department of Economic Development and Commerce (DDEC, in its Spanish-language acronym), and the private sector of Puerto Rico—and the Task Force has fulfilled that mandate.

Finally, the Task Force staff held a conference call with the Secretary of the Puerto Rico Department of Health, Dr. Ana Rius Armendariz, to discuss Administrative Order 346, issued by the Department on February 9, 2016.

## **2. Organization of Report**

This report is organized as follows. Following this “Introduction” section, there is a “Background” section that includes two subsections. Subsection 1 presents a brief overview of the economic, fiscal and demographic situation in Puerto Rico. Subsection 2 provides information on Puerto Rico’s treatment under federal programs. As explained in Subsection 2, in an effort to inform policymakers and the public, the Task Force has prepared a table of approximately 40 federal programs that allocate resources to states and territories according to a formula, where that formula treats Puerto Rico differently than the states. That table appears in **Appendix 2**. The “Background” section is followed by the “Discussion and Recommendations” section, which contains the Task Force’s recommendations to Congress, federal agencies, and the government of Puerto Rico. Recommendations are organized by subject matter area or by federal agency. Since Section 409(g) of PROMESA makes clear that the Task Force should focus on federal laws and programs, recommendations to the government of Puerto Rico are purposefully limited in scope, confined to areas where there is a strong federal nexus.

Section 409(h) of PROMESA instructs the Task Force that, “[t]o the greatest extent practicable,” the Task Force report “shall reflect the shared views of all eight Members.” Consistent with that directive, where the Task Force does make a specific recommendation, that recommendation reflects a consensus among the members. Section 409(h) authorizes a member, or multiple members, to publish dissenting views, but no member has elected to do so.

The Task Force notes that a number of its recommendations also apply to the four other U.S. territories—American Samoa, Guam, the Northern Mariana Islands, and the United States Virgin Islands, which (to varying degrees) face considerable challenges of their own.

## **3. Statement of Purpose**

The 3.4 million U.S. citizens in Puerto Rico confront significant economic, financial, and social challenges. A review of Puerto Rico’s history demonstrates that these challenges are enduring, not transitory. In recent years, the challenges have grown more severe, and have attracted more attention from policymakers and the public.

The Task Force is of the view that Puerto Rico’s best days lie before it, not behind it. It is a fact that residents of Puerto Rico, who have greatly contributed to this nation in times of both war and peace, are as talented and as hard-working as their fellow citizens living anywhere else in the

country.<sup>1</sup> It is also a fact that they have not always been well served by their leaders in San Juan or in Washington, DC. The Task Force believes that the people of Puerto Rico deserve a strong, stable and diversified economy. Judging from the written submissions that the Task Force received through the email portal, there is no shortage of important economic development work being performed or planned in Puerto Rico.<sup>2</sup>

The Task Force hopes this report will contribute to a brighter future in Puerto Rico. At the same time, the Task Force offers a word of caution to those expecting a “federal solution” to each of Puerto Rico’s problems. There are certain challenges in Puerto Rico—such as an outdated energy system, a troubled K-12 public education system, and inefficiencies in various other sectors—that must be tackled first and foremost by the government of Puerto Rico and the private sector.

The members of the Task Force have worked across party lines to identify steps that can be taken to help Puerto Rico’s economy stabilize and grow. The Task Force hopes that its work will serve as a platform for continued bipartisan efforts to support the American citizens in Puerto Rico.

## **Background**

### **1. Overview of Economic, Fiscal and Demographic Situation in Puerto Rico**

Individual members of the Task Force have a range of views on PROMESA itself, which authorizes public entities in Puerto Rico to restructure their debts pursuant to a process prescribed by law, and establishes a seven-member Oversight Board to temporarily supervise or otherwise be involved in decision-making by the government of Puerto Rico on budgetary, fiscal, and debt restructuring matters.<sup>3</sup> However, the members of the Task Force concur that

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<sup>1</sup> For example, the director of the Minority Business Development Agency within the U.S. Department of Commerce informed the Task Force that an executive from the world’s largest aerospace company told her that many of the company’s best engineers are recruited from Puerto Rico, which is home to one of the leading engineering schools in the nation (the University of Puerto Rico at Mayagüez). Similarly, representatives of biotechnology firms operating in Puerto Rico regularly cite the productivity and technical proficiency of the locally-educated, locally-trained workforce.

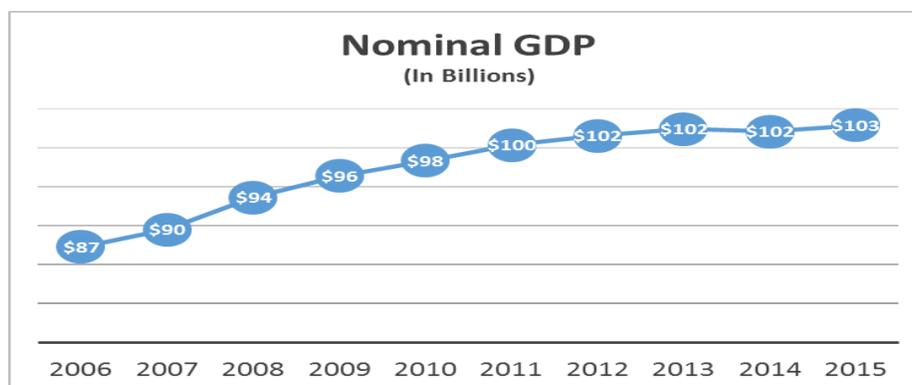
<sup>2</sup> For a sampling of many possible examples, *see* Appendix 2 for submissions from Paralle118; the Puerto Rico Science, Technology, and Research Trust; the Aeronautical and Aerospace Institute of Puerto Rico; the Puerto Rico Chapter of the Association of Information Technology Professionals; the Foundation for Puerto Rico; Non-Profit Community Service Organizations in Puerto Rico (*Red de Fundaciones de Puerto Rico* and *Una Sola Voz*); the Puerto Rico Community Foundation; the Puerto Rico Information Technology Cluster; and the Youth Development Institute.

<sup>3</sup> For an overview of PROMESA, see D. Andrew Austin et al, [The Puerto Rico Oversight, Management, and Economic Stability Act](#), Congressional Research Service, July 1, 2016.

PROMESA is a product of the grave economic, fiscal and demographic situation in Puerto Rico. The crisis has multiple root causes, and a discussion of those causes is beyond the scope of this report. Nevertheless, it is clear that Puerto Rico faces formidable challenges.

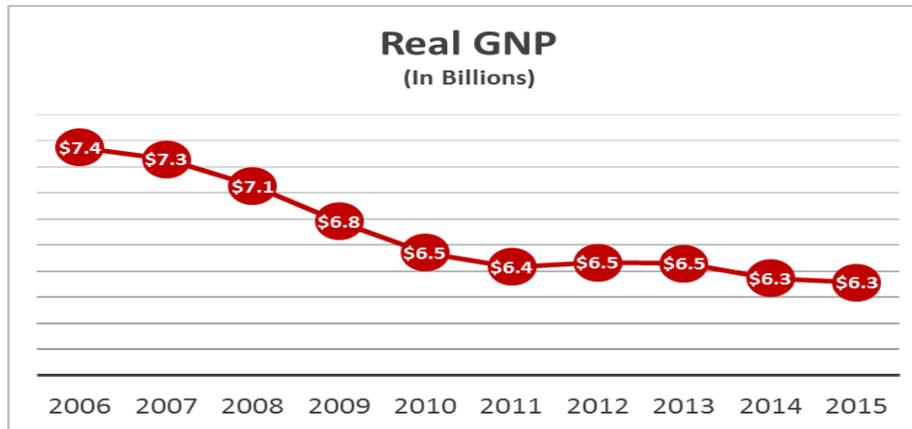
The Task Force will summarize current conditions on the island with a series of bullet points. Because Puerto Rico is a U.S. jurisdiction, the 50 states and the District of Columbia serve as an appropriate point of comparison. As discussed later in the report, many federal statistical programs that collect and publish state-by-state economic data do not collect and publish data for Puerto Rico. Likewise, economic data produced by the government of Puerto Rico are often unreliable or untimely, although efforts are underway to make improvements in this area. Accordingly, the Task Force was not able to obtain as much information about Puerto Rico's economy and government finances as it would have liked. Nevertheless, sufficient information exists to form a reasonably accurate picture of the territory's economy.

- Puerto Rico's economy is typically measured using gross national product (GNP), rather than gross domestic product (GDP). Puerto Rico's GNP is calculated by the Puerto Rico Planning Board (*Junta de Planificación de Puerto Rico*). According to the [Statistical Appendix](#) to the Puerto Rico Planning Board's Fiscal Year 2015 Economic Report to the Governor and Legislative Assembly, Puerto Rico's real GNP—measured in constant 1954 dollars—contracted every year between Fiscal Year 2006 (\$7.4 billion) and Fiscal Year 2015 (\$6.3 billion), except for one year of slight growth between Fiscal Year 2011 (\$6.43 billion) and Fiscal Year 2012 (\$6.47 billion).<sup>4</sup> In nominal terms, Puerto Rico's GNP increased from \$57.9 billion in Fiscal Year 2006 to \$68.5 billion in Fiscal Year 2015, and its GDP increased from \$87.3 billion in Fiscal Year 2006 to \$102.9 billion in Fiscal Year 2015.<sup>5</sup>

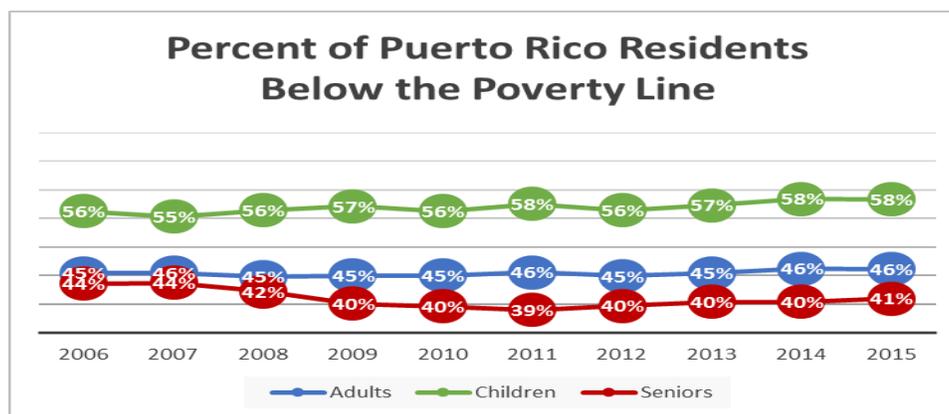


<sup>4</sup> See [Statistical Appendix](#), page A-6.

<sup>5</sup> See [Statistical Appendix](#), page A-1.



- The Puerto Rico Fiscal Agency and Financial Advisory Authority (FAFAA), formerly the Puerto Rico Government Development Bank (GDB), maintains an [Economic Activity Index](#) (EAI) that consists of four factors: (1) payroll employment, (2) electric power generation, (3) cement sales, and (4) gasoline consumption. Between August 2005 and August 2016, the EAI fell by approximately 20 percent, from nearly 160.0 to 124.1.
- According to the U.S. Census Bureau’s 2015 Puerto Rico Community Survey and the 2015 American Community Survey, 46.1 percent of Puerto Rico residents live below the federal poverty level, compared to a national average of 14.7 percent.<sup>6</sup> Of Puerto Rico residents under age 18, 58.3 percent live below the federal poverty level, compared to a national average of 20.7 percent. Of children in Puerto Rico under age 5, 63.7 percent live below the federal poverty level, compared to a national average of 22.8 percent. Of Puerto Rico seniors age 65 and older, 41 percent live below the federal poverty level, compared to about 9 percent nationally.



<sup>6</sup> To corroborate the Census Bureau data referenced in this report, readers can use the “Advanced Search” function on American FactFinder, available [here](#).

- According to the 2015 Puerto Rico Community Survey, median household income in Puerto Rico is \$18,626, with 83.3 percent of island households earning less than \$50,000 per year. In the states and the District of Columbia, median household income is [\\$56,515](#). The state with the lowest median household income is Mississippi, at \$40,593. According to May 2015 data from the Bureau of Labor Statistics (BLS) within the U.S. Department of Labor, the median hourly wage for workers in Puerto Rico is [\\$9.61](#), while the median hourly wage in the states and the District of Columbia is [\\$17.40](#).
- According to [BLS](#), Puerto Rico’s unemployment rate in October 2016 was 12.1 percent, while the national unemployment rate was 4.9 percent and the state with the highest unemployment rate was Alaska at 6.8 percent. According to historical state-by-state BLS unemployment [data](#), which have been published since January 1976, Puerto Rico’s unemployment rate has always been several percentage points or more higher than the state with the highest unemployment rate. From January 1976 to December 1989, Puerto Rico’s average unemployment rate was about 19 percent. From January 1990 to December 1999, it was about 14 percent. From January 2000 to December 2009, it was about 12 percent. And from January 2010 to October 2016, it was about 14 percent.
- According to [BLS](#), the number of persons employed in Puerto Rico peaked in December 2006 at 1,277,559. In October 2016, that figure was 987,606—a 23 percent reduction.<sup>7</sup> According to the Puerto Rico Planning Board, even when employment was at its peak in Puerto Rico in 2006, the labor force participation rate was 48.6 percent.<sup>8</sup> In 2015, the labor force participation rate was 39.9 percent.<sup>9</sup> According to [BLS](#), the national labor force participation rate is approximately 63 percent.
- Puerto Rico has a large informal or “underground” economy, which refers to activities and income that are partially or fully outside of government regulation (e.g., minimum wage laws and workplace safety laws) and taxation (e.g., income tax and employment tax). Although the size of Puerto Rico’s informal economy is, by definition, difficult to measure with precision, estimates about its size generally range from about 15 percent of GNP to about [20 percent](#) of GNP. The existence of a large informal economy has a number of negative effects, chief among them the erosion of Puerto Rico’s individual and corporate tax base,

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<sup>7</sup> The employment decline in this period—23 percent—was significantly larger than the population decline—about 8 percent—during the same period.

<sup>8</sup> The labor force participation rate measures the labor force—the sum of employed individuals and unemployed individuals who do not have a job and are looking for work—as a percentage of the non-institutionalized population age 16 and older.

<sup>9</sup> See [Statistical Appendix](#), page A-62.

which deprives the government of revenue needed to finance operations, provide services, and meet debt obligations.

- According to the proposed [Fiscal Plan](#) and [Appendix](#) presented to the Oversight Board by the government of Puerto Rico on October 14, 2016, Puerto Rico’s aggregate public sector debt stock is \$68.7 billion, which is roughly equal to Puerto Rico’s nominal GNP. Puerto Rico’s public sector debt as a percentage of GNP grew steadily starting in Fiscal Year 2001, when it was about 60 percent of GNP. In 2005, it was about 70 percent of GNP. In 2009, it was about 90 percent of GNP. By 2013, it was about 102 percent of GNP.<sup>10</sup> According to a 2014 [report](#) published by the Federal Reserve Bank of New York (FRBNY)—which oversees the Second District of the Federal Reserve System, which encompasses Puerto Rico—Puerto Rico’s public debt to GNP ratio is “far higher” than the public debt to GDP ratio of any state.<sup>11</sup>
- According to the [Independent Auditors Report](#) accompanying the government of Puerto Rico’s audited financial statements for Fiscal Year 2013-Fiscal Year 2014, which were not released until July 1, 2016, the main public pension systems in Puerto Rico—the Puerto Rico Teachers Retirement System (TRS), the Puerto Rico Government Employees Retirement System (ERS), and the Puerto Rico Judiciary Retirement System (JRS)—“are at risk of becoming insolvent.”
  - As of June 30, 2015, the [TRS](#) reported a net pension liability of \$15.0 billion with a “funded ratio”—the value of assets as a percentage of total pension liability—of 8.1 percent.
  - As of June 30, 2015, the [ERS](#)—which provides retirement benefits to former central government employees, municipal government employees, and employees of all but one public corporation—is in a *negative* funded position, when assets are considered net of pension obligation bond proceeds. ERS reported a net pension liability of \$33.2 billion with a funded ratio of -1.8 percent.

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<sup>10</sup> See [Testimony](#) of Sergio M. Marxuach, Center for a New Economy, Hearing on “Financial and Economic Challenges in Puerto Rico,” Senate Committee on Finance, September 29, 2015, at page 25; Carlos A. Colón De Armas, Submission to Congressional Task Force on Economic Growth in Puerto Rico, at page 12; D. Andrew Austin, [Puerto Rico’s Current Fiscal Challenges: In Brief](#), Congressional Research Service, June 3, 2016, at page 10.

<sup>11</sup> See Federal Reserve Bank of New York, [An Update on the Competitiveness of Puerto Rico’s Economy](#), July 31, 2014, at page 16.

- As of June 30, 2015, the [JRS](#) net pension liability was \$542.6 million, with a funded ratio of 7.3 percent.

(\$ thousands)	ERS 2015	TRS 2015	JRS 2015
<b>Total Pension Liability (TPL)</b>	32,669,162	16,307,731	585,312
<b>Actuarial Value of Assets (net)</b>	(578,633)	1,313,148	42,729
<b>Net Pension Liability</b>	33,247,795	14,994,583	542,583
<b>Net Position as % of TPL</b>	-1.8%	8.1%	7.3%

- According to the U.S. Census Bureau, Puerto Rico’s population was [3,808,610](#) in 2000. The island’s population peaked in 2004, at [3,826,878](#) and has decreased every year since then. Puerto Rico’s population in 2015 stood at [3,474,182](#). From the 2004 peak, that is a loss of 352,696 persons, or 9.2 percent. Researchers at the FRBNY have called the population loss in the territory “staggering” and published multiple reports examining its nature and implications.<sup>12</sup> According to the 2015 American Community Survey, there are now 5.4 million individuals of Puerto Rican birth or descent living in the 50 states and the District of Columbia, up from 3.8 million in 2005. Of those 5.4 million, 1.7 million were born in Puerto Rico, up from 1.3 million in 2005.
- According to the [FRBNY](#), the mortgage delinquency rate (the percentage of mortgage balances that are more than 90 days due) in both Puerto Rico and the United States as a whole rose sharply between 2005 and 2009. While the delinquency rate in the United States has since fallen to about 2 percent, the delinquency rate in Puerto Rico—which peaked in 2010 at 8 percent—“has remained stubbornly high, at 7 percent.” The FRBNY notes that “[s]erious delinquency rates on other forms of debt in Puerto Rico also remain well above those on the mainland.”
- FRBNY researchers have identified a number of challenges facing Puerto Rico—such as the need to improve labor market opportunities, develop human capital, lower the costs of doing business, mobilize financing for business development and growth, and reduce dependence on the “shrinking” pharmaceutical industry—and presented a series of corresponding policy recommendations.<sup>13</sup> While the Task Force does not necessarily endorse all of the policy

<sup>12</sup> See, e.g., [Migration in Puerto Rico: Is There a Brain Drain?](#), Liberty Street Economics, August 9, 2016; [Population Lost: Puerto Rico’s Troubling Out-Migration](#), Liberty Street Economics, April 13, 2015; [The Causes and Consequences of Puerto Rico’s Declining Population](#), Current Issues in Economics and Finance (Volume 20, Number 4; 2014).

<sup>13</sup> See, e.g., Federal Reserve Bank of New York, [A Report on the Competitiveness of Puerto Rico’s Economy](#), June 29, 2012; Federal Reserve Bank of New York, [An Update on the Competitiveness of Puerto Rico’s Economy](#), July 31, 2014; William C. Dudley, President and Chief Executive Officer,

recommendations of the FRBNY researchers, it does believe they are worthy of study and debate.

- A decade ago, researchers from across the political spectrum, organized by the Brookings Institution and the Puerto Rico-based Center for the New Economy (CNE), authored a series of academic papers on obstacles to economic growth in Puerto Rico, and policies that could help overcome those obstacles, and these papers were compiled in a 2006 book.<sup>14</sup> Many of the challenges identified at the time remain challenges today, and some have become more severe. Corrective actions that could have been taken at the time were not, in part because of Puerto Rico’s excessive reliance on debt financing. While the Task Force does not necessarily endorse all of the policy recommendations contained in the Brookings-CNE book, it does believe that the book remains a useful tool for policymakers thinking about Puerto Rico.

## 2. Puerto Rico’s Treatment Under Federal Programs

The U.S. Supreme Court has [held](#) that the Territory Clause of the U.S. Constitution (Article IV, Section 3, Clause 2) authorizes Congress to treat territories differently than states under federal laws and programs as long as there is a “rational basis” for the differential treatment. Congress generally determines whether Puerto Rico and the four other territories are eligible for federal programs on a case-by-case basis, and defines any differential treatment in law. Puerto Rico is treated the same as the states under certain federal programs, and differently than the states under other federal programs.

Federal law provides that a bona fide resident of Puerto Rico is generally not required to pay federal tax on income he or she earns in Puerto Rico (except for income earned by the roughly [9,400](#) federal government employees on the island), and that a corporation organized in Puerto Rico is generally treated as a foreign corporation for U.S. tax purposes, and therefore is generally not required to pay federal tax on its Puerto Rico-source income.<sup>15</sup>

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Federal Reserve Bank of New York, “[Opportunities for Economic Growth in Puerto Rico](#),” November 29, 2016.

<sup>14</sup> See [The Economy of Puerto Rico: Restoring Growth](#), edited by Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class (CNE/Brookings 2006).

<sup>15</sup> For information on Puerto Rico’s treatment under federal tax law, see [Federal Tax Law And Issues Related To The Commonwealth Of Puerto Rico](#), Joint Committee on Taxation, September 28, 2015 (JCX-132-15); [Puerto Rico, Information on How Statehood Would Potentially Affect Selected Federal Programs and Revenue Sources](#), Government Accountability Office, March 2014 (GAO-14-31); and Sean Lowry, [Tax Policy and U.S. Territories: Overview and Issues for Congress](#), Congressional Research Service, October 7, 2016.

In those instances when Congress does choose to treat Puerto Rico differently than the states under a particular federal assistance program that is funded by appropriations made from the general fund of the United States, Congress often relies, either explicitly or implicitly, on the argument that such differential treatment is warranted because individuals and businesses in Puerto Rico do not contribute federal income taxes into the general fund to the same degree and extent as their counterparts in the states.

The tax treatment of U.S. corporations operating in Puerto Rico is more complex. U.S. corporations are subject to federal income tax on their worldwide earnings. Generally, income earned by the active business operations of U.S. corporations in Puerto Rico is considered foreign-source income. Federal tax on active corporate income earned in Puerto Rico by foreign *subsidiaries* of U.S. corporations—known as controlled foreign corporations (CFCs)—can be deferred until these earnings are “repatriated” to the United States in the form of dividend distributions to the U.S. parent corporation. However, federal tax on the income earned by foreign *branches* of U.S. corporations is not deferrable. A foreign subsidiary is a legal entity separate from its parent company, while a foreign branch is an extension of a domestic company. Most, but not all, U.S. corporations with active business operations in Puerto Rico are organized as CFCs.

Federal law generally requires individuals and businesses in Puerto Rico to pay federal tax on income they earn outside of Puerto Rico, whether in the United States or in a foreign country. Federal law also requires employers and employees in Puerto Rico to pay all federal payroll taxes, which fund the Old Age, Survivors, and Disability Insurance program (Social Security), the Medicare hospital insurance program, and the federal unemployment compensation program. According to the 2015 [Internal Revenue Service Data Book](#), the IRS collected \$3.52 billion in federal taxes on individuals and businesses in Puerto Rico in Fiscal Year 2015.<sup>16</sup>

With the assistance of CRS, the Task Force has created a table of approximately 40 federal programs that allocate resources according to a formula, as distinct from programs that allocate resources on a competitive basis, under which Puerto Rico is treated differently than the states and, in certain cases, differently than other territories. The table, which appears in **Appendix 3**, is intended to be thorough but not exhaustive. It provides: (1) the name of the program; (2) the federal executive branch agency that administers the program; (3) the congressional committees in the Senate and the House with jurisdiction over the program; and (4) a description of Puerto Rico’s differential treatment under the program. The table also includes certain programs that allocate resources but do not fall within the commonly-understood definition of a formula-based program.

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<sup>16</sup> See [Internal Revenue Service Data Book](#), at page 12, Table 5.

This table is intended solely to provide factual information to policymakers and the public. Reference to a program should not be interpreted to signify either support for or opposition to Puerto Rico's differential treatment under the program on the part of the Task Force. Later in the report, the Task Force will make recommendations pertaining to several of these programs.

With respect to federal programs that allocate resources on a competitive basis, rather than pursuant to a formula prescribed in law, the Task Force's informed judgment is that entities in Puerto Rico—whether it be the central government, municipal governments, for-profit firms, or non-profit organizations—tend to fare poorly relative to entities in other jurisdictions, and often do not apply for available funding or apply unsuccessfully. While there is no simple way to reverse this trend, the Task Force believes that steps should be taken by Puerto Rico-based entities to better familiarize themselves with competitive funding opportunities across the federal government, and that the government of Puerto Rico and federal agencies should enhance their respective efforts to provide these entities with information and technical assistance.

In addition, the Task Force is aware of numerous instances in which the government of Puerto Rico has received a formula-based or competitive grant from the federal government, but has not utilized all of that funding within the applicable time frame, thereby requiring the return of unused funding to the federal treasury. Although this problem is not unique to Puerto Rico, it does appear to be more pronounced on the island compared to other jurisdictions, based on information provided to the Task Force. The Task Force urges the government of Puerto Rico as a whole, and each Puerto Rico agency individually, to scrutinize its grant management system so as to reduce such funding reversions to the greatest extent possible. The Task Force further urges the government of Puerto Rico to make appropriate use of available federal support services in this area. Every federal grant dollar returned by the local government is a missed opportunity to assist the people of Puerto Rico.

## **Discussion and Recommendations**

### **1. Health Care**

Section 409(g)(1) of PROMESA requires the Task Force to make recommendations regarding impediments in current federal law and programs to economic growth in Puerto Rico, “including equitable access to federal health care programs.”

On October 7<sup>th</sup>, the Task Force held a staff-level briefing with officials from the U.S. Department of Health and Human Services (HHS). The Task Force also spoke to a wide range of stakeholders in Puerto Rico's health care community. In addition, numerous individuals and

organizations made submissions via the Task Force's email portal that discuss this topic. Finally, the Task Force consulted an analysis of the subject prepared by CRS.<sup>17</sup>

### **A. Medicaid**

The Task Force believes that the future financing of the Medicaid program in Puerto Rico is a serious and urgent issue facing federal policymakers attempting to address the territory's economic and social challenges.

Members of the Task Force have differing views regarding the proper role of the federal government in financing federal health programs in general and the Medicaid program in particular, as well as regarding the relative merits of the 2010 Patient Protection and Affordable Care Act (ACA; P.L. 111-148, as amended). However, Task Force members agree that, irrespective of these larger policy disagreements and the congressional debates they will continue to generate in the coming years, an equitable and sustainable legislative solution to the financing of Puerto Rico's Medicaid program should be enacted early in 2017.

Medicaid is a joint federal-state program that finances the delivery of medical services for low-income individuals. In Fiscal Year 2015, Medicaid (including the State Children's Health Insurance Program, or CHIP) is [estimated](#) to have provided health care services to 73 million individuals at a total cost of \$509 billion in federal and state expenditures.

Puerto Rico's Medicaid program, known locally as Mi Salud, has about 1.4 million enrollees, which is over 40 percent of the island's population, a higher proportion than the 50 states and the District of Columbia. Like numerous states, Puerto Rico uses a managed care system to deliver Medicaid services. The territory's Medicaid agency contracts with managed care organizations that accept a set per-member, per-month payment, known as a capitation payment.

Federal Medicaid funding to the states and the District of Columbia is open-ended—that is, not subject to any cap. The federal government reimburses each state for a portion of the state's Medicaid expenditures. The federal share is known as the federal medical assistance percentage (FMAP). The FMAP is determined by a formula set in statute and varies by state, with a higher reimbursement rate provided to states with lower per capita incomes, and vice versa.<sup>18</sup> There is a statutory minimum FMAP rate of 50 percent and a statutory maximum FMAP rate of 83

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<sup>17</sup> See Annie L. Mach et al, [Puerto Rico and Health Care Finance: Frequently Asked Questions](#), Congressional Research Service, June 27, 2016.

<sup>18</sup> As of Fiscal Year 1998, the District of Columbia's FMAP rate is set by statute at 70 percent. Without this exception, it would be at the statutory minimum of 50 percent.

percent.<sup>19</sup> In Fiscal Year 2016, nine states, including the District of Columbia, had an FMAP rate of 70 percent or above, with Mississippi having the highest at 74.17 percent.<sup>20</sup>

By contrast, in Puerto Rico and the other territories, federal Medicaid funding is subject to an annual cap pursuant to [Section 1108](#) of the Social Security Act (42 U.S.C. 1308). The cap increases annually according to the change in the Consumer Price Index for All Urban Consumers (CPI-U). Once the annual federal funding cap is reached, the territory government is responsible for the remaining cost of all Medicaid services. Puerto Rico’s annual cap in Fiscal Year 2016 was \$335.3 million.<sup>21</sup>

Also in contrast to the states, the FMAP rates for the territories are not based on per capita income, but rather are fixed in federal statute. Prior to July 1, 2011, the statutory FMAP rate for the territories was 50 percent. If the FMAP rates for the territories were calculated based on per capita income, each territory would have an FMAP rate in the 70 to 80 percent range.<sup>22</sup>

Members of the Task Force recognize that the ACA contained both positive and negative elements for the territories’ Medicaid programs, insofar as the law provided additional funding but made that funding temporary. Specifically, the ACA provided for a one-time increase in Medicaid funding for the territories of \$7.3 billion, of which Puerto Rico received \$6.4 billion. The ACA also permanently increased the territories’ statutory FMAP rate from 50 percent to 55 percent—still below the FMAP rate each territory would receive if its rate were based on per capita income.

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<sup>19</sup> This discussion involves the “regular” FMAP rate. Current federal law provides for higher—“enhanced”—FMAP rates for certain services or population groups, which is not pertinent for present purposes.

<sup>20</sup> This information is drawn from Alison Mitchell, “Medicaid’s Federal Medical Assistance Percentage (FMAP),” Congressional Research Service, February 9, 2016.

<sup>21</sup> According to the Centers for Medicare and Medicaid Services, Puerto Rico’s annual cap was \$45 million in Fiscal Year 1983, \$79 million in Fiscal Year 1993, \$207.3 million in Fiscal Year 2003, and \$280 million in Fiscal Year 2010. The Fiscal Year 2016 cap was \$11.1 million for American Samoa, \$5.9 million for the Northern Mariana Islands, \$16.3 million for Guam, and \$16.8 million for the U.S. Virgin Islands.

<sup>22</sup> According to CRS, Puerto Rico’s FMAP rate would likely be 83 percent, the maximum rate allowable under current Medicaid law. See Annie L. Mach et al, [Puerto Rico and Health Care Finance: Frequently Asked Questions](#), Congressional Research Service, June 27, 2016, at page 25, footnote 88.

To date, according to CMS, Puerto Rico has drawn down all but approximately \$1 billion of this \$6.4 billion in supplemental funding.<sup>23</sup> Based on CMS’s projections, Puerto Rico’s supplemental funding will be depleted before the end of calendar year 2017, a date that has come to be known as the “Medicaid cliff.” Once Puerto Rico depletes this supplemental funding, it will revert to receiving only its annual capped federal Medicaid allotment, which is expected to be \$357.8 million in Fiscal Year 2018.<sup>24</sup>

Members of the Task Force understand the often-heard argument that Puerto Rico does not receive state-like treatment under Medicaid because the program is financed from the general fund of the United States, and individuals and businesses in Puerto Rico are not required under federal law to contribute to the general fund to the same degree and extent as their counterparts in the states. Some members of the Task Force believe that different treatment on the tax-contribution side of the ledger may warrant different treatment on the federal outlay side of the ledger. Other members of the Task Force do not subscribe to this view. However, all members of the Task Force believe that, even if differential tax treatment may potentially serve as an argument against *equal* treatment for Puerto Rico under Medicaid, more *equitable* treatment should still be considered.

While it would be wrong to attribute Puerto Rico’s annual deficits and accumulated debt solely, or even mainly, to the disproportionate burden it bears in financing its Medicaid program, it would also be wrong to deny that this funding disparity has been a meaningful factor contributing to Puerto Rico’s fiscal condition.

Inadequate federal financing for Puerto Rico’s Medicaid program long pre-dates the 2010 ACA. It will remain an urgent problem whether the ACA is retained or not.

Inadequate federal financing for Puerto Rico’s Medicaid program may “save” federal taxpayer dollars in the short term. However, over time, these savings are likely to be at least partially offset by the additional costs borne by the federal government and state governments as a result of conditions-based migration from Puerto Rico to the U.S. mainland. The costs will be

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<sup>23</sup> Puerto Rico drew down an average of \$917 million in supplemental funding annually between Fiscal Year 2012 and Fiscal Year 2016. In Fiscal Year 2012, the first full year in which this funding was available, Puerto Rico drew down \$564 million. In Fiscal Year 2016, the most recent completed fiscal year, Puerto Rico drew down \$1.3 billion.

<sup>24</sup> In addition to its annual capped federal allotment under Section 1108 of the Social Security Act, Puerto Rico receives CHIP funding (\$180 million in Fiscal Year 2016); so-called enhanced allotment program (EAP) funding under Section 1935 of the Social Security Act (\$49 million in Fiscal Year 2016, less than half of which it was able to utilize, as detailed in the “Medicare Part D” section below); electronic health records (EHR) funding (\$35 million in Fiscal Year 2014); and administrative funding for its Medicaid Management Information System (MMIS; \$900,000 in Fiscal Year 2014).

particularly significant for states, like Florida, that are popular destinations for individuals from Puerto Rico.

If Congress does not enact legislation to avoid the impending Medicaid cliff, the consequences for the health care system in Puerto Rico are likely to be severe. The government of Puerto Rico, which currently lacks the ability to borrow money in the capital markets to fill the large hole that will be left by the loss of federal funding, would presumably be compelled either to drop hundreds of thousands of current enrollees from the Medicaid program (harming quality of life and spurring outmigration) or to reallocate funds from other areas, such as payments to creditors and the provision of public services.

The approaching Medicaid cliff, a foreseeable consequence of the funding structure established in the ACA's provisions regarding the territories, presents policymakers with the need to address this issue in the near term. Given its magnitude, the cliff is certain to disrupt any existing stability in the provision of health care services in Puerto Rico for a large number of beneficiaries.

The Task Force makes the following recommendations:

- The Task Force believes that Puerto Rico and the other territories should be treated in a more equitable and sustainable manner under the Medicaid program, in order to improve patient outcomes in the territories, to strengthen the health care systems in the territories, to enhance federal oversight of those systems, to reduce the incentive for migration from the territories to the states and the associated financial costs to state governments and the federal government, and to stabilize and strengthen the fiscal condition of the territory governments. To that end, the Task Force recommends that **Congress** enact fiscally-responsible legislation to address the impending Medicaid cliff established by the ACA. The Task Force recommends that Congress begin to address the funding issue early in calendar year 2017 to enable the Puerto Rico Medicaid agency to engage with more certainty when formulating capitation payment contracts with its managed care organizations for Puerto Rico Fiscal Year 2017-2018, which begins on July 1, 2017. In addition, the Task Force recommends that, going forward, federal financing of the Medicaid programs in Puerto Rico and the other territories should be more closely tied to the size and needs of the territory's low-income population. Finally, the Task Force recommends that any additional federal Medicaid funding provided to Puerto Rico must be paired with appropriate oversight of and safeguards on Puerto Rico's Medicaid program through use of the MFCU and MMIS mechanisms.
- Federal law requires every state, the District of Columbia, and each U.S. territory to operate a [Medicaid Fraud Control Unit](#) (MFCU) to investigate and prosecute Medicaid provider fraud and patient abuse or neglect under state law, unless the state or territory receives a waiver by

demonstrating to the satisfaction of the Secretary of HHS that the operation of a MFCU would not be cost-effective.<sup>25</sup> MFCUs are typically part of the state Attorney General’s office; employ teams of investigators, attorneys, and auditors; and must be separate and distinct from the state Medicaid agency. Currently, 49 states (North Dakota being the exception) and the District of Columbia have MFCUs. Federal law provides for an enhanced FMAP rate to support MFCUs. None of the five territories operate a MFCU, presumably inhibited from doing so because of the annual federal Medicaid funding cap that applies to the territories.<sup>26</sup> The Task Force recommends that **Congress** enact legislation to remove the current disincentive to establish MFCUs that exists in the territories as a consequence of the annual funding cap.<sup>27</sup> Once that occurs, the Task Force recommends that the government of Puerto Rico establish a MFCU.

- States and territories are required to operate an automated claims processing and information retrieval system, or [Medicaid Management Information System \(MMIS\)](#), to administer their state Medicaid plans. The overarching purpose of an MMIS is to enhance the efficiency and improve the internal controls over a jurisdiction’s Medicaid program and to minimize the potential for waste, fraud and abuse. Puerto Rico is already working with CMS to develop an MMIS, with \$55 million—\$46 million in federal funding and \$9 million in local funding—having been committed to this effort to date. In the written agreements between CMS and the government of Puerto Rico, there are several clearly-delineated targets and milestones to be achieved. The Task Force recommends that **Congress** ensure that Puerto Rico’s ongoing efforts to construct its MMIS continue to completion in compliance with the funding agreements with CMS, and believes that it is appropriate to require continued progress on the MMIS and achievement of targets and milestones set forth in the agreements with CMS as a condition for additional federal Medicaid funding.

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<sup>25</sup> See Social Security Act 1902(a)(61), 1903(q).

<sup>26</sup> See [Testimony](#) of John Hagg, Director of Medicaid Audits, Office of Inspector General, U.S. Department of Health and Human Services, Hearing on “Strengthening Medicaid Program Integrity and Closing Loopholes,” House Committee on Energy and Commerce, September 11, 2015, at page 5 (noting that “[t]he major barrier to establishing a MFCU in Puerto Rico and the other territories is the nature of Medicaid funding for the territories,” since “the territories receive a capped appropriation to provide both Medicaid services and most administrative costs, which would include operation of a MFCU”).

<sup>27</sup> See H.R. 3444, Medicaid and CHIP Territory Fraud Prevention Act (114<sup>th</sup> Congress; Rep. Pitts), bipartisan legislation that would accomplish this objective.

## **B. Medicare**

### **I. Medicare Part A**

Medicare is a federal program that pays for covered health care services to individuals over age 65 and certain individuals with disabilities. Medicare Part A provides coverage for inpatient hospital services, as well as services like skilled nursing, home health, and hospice care. Unlike hospitals in the other territories, which are paid on a cost basis, subject to certain limitations, hospitals in Puerto Rico are paid using a prospective payment system that is comparable to the Medicare inpatient prospective payment system (IPPS) created to pay hospitals in the 50 states. Hospitals in Puerto Rico are not included in Medicare’s current definition of a “subsection (d) hospital”—which denotes hospitals located in the states. Congress enacted a separate prospective payment system for “subsection (d) Puerto Rico hospitals” in the Omnibus Budget Reconciliation Act of 1986, effective for payments starting in Fiscal Year 1986.

Eligible hospitals in the states and Puerto Rico that treat a certain share of low-income patients can receive additional payments—called Medicare Disproportionate Share Hospital (DSH) payments—to offset the financial effects of treating such patients. Prior to Fiscal Year 2014, DSH payments were provided by a single statutory formula that increased the inpatient prospective payment system (IPPS) reimbursement amount based on the disproportionate patient percentage (DPP). The DPP was based on a hospital’s share of low-income patients, defined as the share of Medicare inpatient days for individuals entitled to federal Supplemental Security Income (SSI) benefits out of a hospital’s total Medicare inpatient days (Medicare/SSI), plus the share of Medicaid inpatient days out of the hospital’s total inpatient days.

In Fiscal Year 2014 and subsequent years, DSH funding has been split into two payments with separate methodologies: (1) “empirically justified” DSH payments, which continue to be based on the traditional DPP, but are limited to 25 percent of the DSH payments that they would have received under prior law; and (2) “uncompensated care pool” fixed DSH payments, which are defined as 75 percent of aggregated operating DSH payments as calculated under the prior DSH formula, multiplied by 1 minus the annual percentage decline in the national uninsured rate. In Fiscal Year 2017, as a proxy for hospital uncompensated care data, the uncompensated care pool will be allocated to hospitals based on their share of Medicaid and Medicare SSI days relative to all other hospitals that receive DSH payments. CMS currently projects a 44 percent decline in the national uninsurance rate between 2013 and 2017, estimating that approximately \$6 billion will be allocated through the DSH uncompensated care pool in 2017.

Currently, Medicare/SSI is a factor in calculating each of the two different DSH payments. However, Congress has not extended the SSI program to Puerto Rico. Instead, Puerto Rico continues to use its own prior income-related disability payment program, called AABD. While

Puerto Rico hospitals may provide care to certain individuals living on the mainland who are eligible for SSI, the vast majority of Puerto Rico residents are ineligible for SSI. Therefore, using Medicare SSI days as a portion of total Medicare days to calculate the DSH uncompensated care pool payment formula—along with the failure to design a payment methodology that appropriately accounts for days provided to patients in both the Puerto Rico disability program and the SSI program—do place Puerto Rico hospitals at a disadvantage.

The Secretary of HHS, using administrative authority in the Fiscal Year 2017 Medicare IPPS final rule, modified the uncompensated care pool payment formula to use 14 percent of a Puerto Rico hospital's Medicaid days as a proxy for Medicare/SSI days. The Secretary did not use a proxy for Medicare/SSI in the empirically justified DSH payment formula, noting that the DPP is prescribed in statute for empirically justified DSH.

The Task Force makes the following recommendation:

- Because the SSI program does not apply in Puerto Rico, the Task Force recommends that **Congress** consider providing increased flexibility to the Secretary of HHS to identify data collection and analysis gaps that could be used to improve the accuracy and efficiency of Medicare DSH payments to Puerto Rico hospitals. For example, one possibility would be to develop a policy that uses a proxy that updates the empirically justified DSH payment formula calculation for subsection (d) Puerto Rico hospitals.

## II. Medicare Part B

Medicare Part B provides coverage for physicians' services, outpatient hospital services, durable medical equipment, outpatient dialysis, and other medical services. Residents of every state and territory *other than Puerto Rico* who are receiving Social Security benefits are automatically enrolled in both Part A and Part B, with coverage beginning the first day of the month they turn 65. In addition, disabled individuals who have received cash payments for 24 months under the Social Security disability programs are automatically enrolled in Part B unless they decline such coverage. Because beneficiaries must pay a premium for Part B coverage, they have the option of opting out of Part B coverage.

Those individuals who are not automatically enrolled in Medicare—for example, because they have not filed for Social Security benefits—must file an application for Part A and Part B with the Social Security Administration during their seven-month initial enrollment period, which begins three months before the month in which they turn 65. Beneficiaries who do not sign up for Part B during this initial enrollment period may have to pay a late-enrollment penalty for as long as they are enrolled in Part B. The late-enrollment penalty increases Part B monthly premiums by 10 percent for each full 12-month period that one could have had Part B but did not

sign up for it. Certain low-income beneficiaries may qualify for Part B premium assistance from Medicaid through a Medicare Savings Program (MSP). Beneficiaries in an MSP are not subject to late-enrollment penalties regardless of when they signed up for Medicare.

Under federal law, when residents of Puerto Rico turn 65 and start receiving Social Security benefits, they are automatically enrolled in Part A, but not automatically enrolled in Part B. Instead, beneficiaries in Puerto Rico are required to take the affirmative step of enrolling in Part B during their seven-month initial enrollment period. If they fail to enroll, they are subject to a lifetime late-enrollment penalty.<sup>28</sup>

The lack of an automatic Part B enrollment process in Puerto Rico has resulted in a disproportionate number of Medicare beneficiaries in Puerto Rico paying the lifetime late-enrollment penalty. Puerto Rico does not have an MSP program, so low-income beneficiaries subject to this penalty may be responsible for paying the full penalty amount in addition to their premiums. According to CMS, there are currently 5,739 Medicare beneficiaries in Puerto Rico who are paying a lifetime penalty for enrolling late in Part B. In addition, according to CMS, there are 108,678 individuals in Puerto Rico who are currently enrolled in Part A only, not Part B. Many of those individuals, if they do elect to enroll in Part B, will be subject to a lifetime late enrollment penalty.

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** amend federal law so that, going forward, Medicare beneficiaries in Puerto Rico are automatically enrolled in Medicare Part B with the option to opt out of coverage, the same way their counterparts in every state and other territory are treated.
- As long as Puerto Rico remains the only U.S. jurisdiction where Medicare beneficiaries are required to opt in to Part B coverage, the Task Force recommends that the **Centers for Medicare and Medicaid Services** and the **Social Security Administration** take timely and targeted steps to educate island residents about the existence of the opt-in requirement and the financial consequences of late enrollment.

### III. Medicare Part C

The Medicare Advantage program, or Medicare Part C, gives Medicare beneficiaries the option to receive covered benefits from private health plans that are paid a per-member, per-month amount to provide services covered by the traditional Medicare fee-for-service program for Part A and B benefits. Many Medicare Advantage plans provide additional supplemental benefits,

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<sup>28</sup> See Social Security Act 1837(f)(3).

such as dental and vision. According to CRS, in May 2015, 75 percent of Medicare beneficiaries in Puerto Rico were enrolled in an MA plan, compared with 32 percent of beneficiaries in the 50 states and the District of Columbia. More than half of MA enrollees in Puerto Rico are in a special type of MA plan called a Special Needs Plan (SNP). While there are three different types of SNPs, nearly half of Puerto Rico beneficiaries are enrolled in a Dual-Eligible SNP (D-SNP), which is a plan that enrolls individuals who are eligible for both Medicare and Medicaid.<sup>29</sup> Dual eligible beneficiaries tend to [experience](#) high rates of chronic illness and multiple chronic conditions.

To address the needs of this particular population, the 2017 Medicare Advantage Final Call Letter included a number of policies to improve stability in the Medicare Advantage program in Puerto Rico. These policies include a change in payment that CMS estimates will result in increased revenue for MA plans in Puerto Rico. More specifically, the following policies have been adopted through the [2017 Medicare Advantage Final Call Letter](#):

- A change in the risk adjustment model that will increase payments to plans with high proportions of full benefit dual eligible beneficiaries, which CMS estimates will benefit Puerto Rico more than any other state or territory;
- An adjustment to the fee-for-service payment basis for plans in 2017 to reflect the higher payments made to hospitals in Puerto Rico in 2016;
- An adjustment to the weighting of the enrollment and risk scores for Medicare beneficiaries based on the nationwide proportion (rather than Puerto Rico alone) of Medicare beneficiaries enrolled in both Parts A and B in fee-for-service that have no Medicare claim reimbursements for a year. CMS applied a 4.4 percent adjustment to the pre-standardized Puerto Rico fee-for-service rates to help develop the benchmarks for 2017; and
- Changes to the Star Ratings System to reflect socioeconomic status specifically related to low income subsidy/dual eligible and/or disability status.<sup>30</sup>

The Task Force makes the following recommendation:

- The Task Force notes that the Medicare Advantage penetration rate continues to grow in the United States more generally as well as in Puerto Rico specifically, where the penetration

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<sup>29</sup> See Annie L. Mach et al, [Puerto Rico and Health Care Finance: Frequently Asked Questions](#), Congressional Research Service, June 27, 2016, at page 15.

<sup>30</sup> See generally Centers for Medicare and Medicaid Services, [Supporting Medicare in Puerto Rico](#), April 4, 2016.

rate is higher than in any other U.S. jurisdiction. As more Medicare beneficiaries choose to enroll in the Medicare Advantage program, the Task Force recommends that **Congress and the Centers for Medicare and Medicaid Services** consider whether additional legislative or administrative steps may be warranted to ensure that MA plans, including those in Puerto Rico, are being fairly and properly compensated for the services they provide to beneficiaries.

#### IV. Medicare Part D

Medicare Part D provides an outpatient prescription drug benefit, either through private prescription drug plans that offer only drug coverage or through Medicare Advantage prescription drug plans that offer coverage as part of broader, managed-care plans. In the states and the District of Columbia, Medicare beneficiaries with incomes up to 150 percent of the federal poverty level are eligible to receive a low-income subsidy (LIS) from the federal government, which reduces or eliminates their monthly premium and other out-of-pocket costs associated with Part D.

Pursuant to federal law, residents of the territories are not eligible for the LIS.<sup>31</sup> In lieu of the LIS, federal law provides a fixed amount of funding to each territory to provide *Medicaid* coverage of prescription drugs for low-income Medicare beneficiaries. This funding is provided pursuant to Section 1935(e) of the Social Security Act, and is referred to as the enhanced allotment program (EAP). Currently, annual EAP funding to Puerto Rico is between \$40 million and \$50 million. This is substantially less than the aggregate amount of financial support that low-income Medicare beneficiaries in Puerto Rico would receive if residents of the territories were eligible for the LIS.

Each territory government is required to match its EAP funding at its regular Medicaid FMAP rate of 55 percent. This means for every dollar a territory spends on providing Medicaid coverage for prescription drugs to low-income Medicare beneficiaries, the territory draws down 55 cents from its allotted Section 1935(e) funding, up to the annual limit, and is responsible for the remaining 45 cents.

Because of the local match requirement, the territories (to varying degrees) have struggled to draw down EAP funding, often leaving much of the funding unused despite a significant need for the funding. For example, between Fiscal Year 2010 and Fiscal Year 2016, Puerto Rico has

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<sup>31</sup> See Social Security Act 1860D-14(a)(3)(F).

been able to draw down only about 51 percent of its EAP funding, as reflected in the following chart.<sup>32</sup>

	EAP Allotment	PR Draw Down	Percentage
FY 2010	\$49,339,617	\$49,339,618	100.0%
FY 2011	\$51,701,315	\$23,716,209	45.87%
FY 2012	\$43,580,880	\$17,357,642	39.83%
FY 2013	\$44,156,704	\$21,818,368	49.41%
FY 2014	\$42,361,118	\$16,936,666	39.98%
FY 2015	\$44,040,604	\$9,240,022	20.98%
FY 2016	\$49,171,794	\$28,332,152	57.61%
<b>FY 2010 – FY 2016</b>	<b>\$324,352,032</b>	<b>\$166,740,677</b>	<b>51.41%</b>

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** eliminate the requirement that each territory government meet a local Medicaid matching requirement in order to draw down its annual EAP funding. The Task Force notes that the matching requirement has prevented the government of Puerto Rico and other territory governments from effectively utilizing EAP funding to help low-income Medicare beneficiaries purchase prescription drugs. The Task Force further recommends that Congress consider increasing the annual EAP allotment for each territory by a reasonable amount and in a fiscally responsible manner, so that the allotment is more closely tethered to actual need in each territory. Finally, the Task Force recommends that Congress explore the feasibility and cost of extending the LIS to residents of the territories and eliminating the EAP program.<sup>33</sup>

## V. CMS Administrative Flexibility

Because Puerto Rico and the other territories are treated differently than the states under federal health statutes, it is not uncommon for a literal interpretation by the Centers for Medicare and

<sup>32</sup> The data underlying this computation were provided by CMS. In addition, according to CMS data, the percentage of EAP funding utilized by the U.S. Virgin Islands between Fiscal Year 2010 and Fiscal Year 2016 was only 27 percent. The percentage utilized by American Samoa, Guam and the Northern Mariana Islands between Fiscal Year 2010 and Fiscal Year 2014 (more recent data have not been provided to the Task Force) was 94 percent, 81 percent, and 93 percent, respectively. However, there have been recent fiscal years in which both Guam and the Northern Mariana Islands drew down less than 55 percent of their EAP funding.

<sup>33</sup> See S. 2342, Territories Medicare Prescription Drug Assistance Equity Act of 2015 (114<sup>th</sup> Congress; Sen. Nelson); H.R. 4163, Territories Medicare Prescription Drug Assistance Equity Act of 2015 (114<sup>th</sup> Congress; Rep. Pierluisi); and Section 215 of S. 2675, Puerto Rico Recovery Act of 2016 (114<sup>th</sup> Congress; Sen. Menendez).

Medicaid Services of a statutory formula that provides for payments to physicians, hospitals or health plans to lead to anomalous results for Puerto Rico that may not have been intended by Congress, as evidenced by the Medicare Part A example discussed above.

The Task Force makes the following recommendation:

- The Task Force recommends that **Congress** consider providing the Centers for Medicare and Medicaid Services with flexibility to make reasoned and justifiable adjustments to a formula providing for payments to physicians, hospitals or health plans in Puerto Rico and the other territories. Use of this flexibility should be limited to any formula that is dependent in whole or in part on data that are not available or not reliable as it pertains to the territories, or dependent on factors that are inapplicable to the territories.

### **C. Family-to-Family Health Information Center Grant Program**

The Family-to-Family Health Information Center Grant program, called the F2F program, is administered by the Health Resources and Services Administration (HRSA) within HHS.<sup>34</sup>

The F2F program was established as part of the Family Opportunity Act, which was included in the Deficit Reduction Act of 2005 (P.L. 109-171). Pursuant to the program, HRSA makes competitive grants on an annual basis to support Family-to-Family Health Information Centers. These centers are primarily non-profit organizations operated by families with children and youth with special health care needs, and they provide education, training, peer support, and expertise in navigating health care systems for other families of children and youth with special health care needs. The law establishing the program makes grants available to support a single center in each of the 50 states and in the District of Columbia, but not in Puerto Rico or the other U.S. territories.<sup>35</sup> The F2F program is currently funded at \$5 million per year. Funding is distributed equally among centers in every state and the District of Columbia, with each center receiving about \$95,000 per year, regardless of the state's population.<sup>36</sup>

The Task Force makes the following recommendation:

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<sup>34</sup> See Family Voices, Submission to Congressional Task Force on Economic Growth in Puerto Rico; Coralaidee Jimenez, Submission to Congressional Task Force on Economic Growth in Puerto Rico.

<sup>35</sup> See 42 U.S.C. 701(c)(5).

<sup>36</sup> In the 113<sup>th</sup> Congress, the Senate Finance Committee approved [S. 1871](#), the SGR Repeal and Medicare Beneficiary Access Act of 2013. Section 323 of S. 1871, which did not ultimately become law, would have made the territories eligible for the F2F program. See [Senate Report 113-135](#), at page 56.

- The Task Force recommends that **Congress** consider amending the law authorizing the Family-to-Family Health Information Center Grant program to enable Puerto Rico and the other territories to participate in the program, in a manner that does not dilute the funding currently available to the states and the District of Columbia.

#### **D. Maternal, Infant, and Early Childhood Home Visiting Program**

The Maternal, Infant, and Early Childhood Home Visiting Program, also known as the Federal Home Visiting Program, is administered by the Health Resources and Services Administration (HRSA) within HHS. The program supports home visiting services for families with young children who reside in communities that have concentrations of poor child health and other risk indicators. Home visits are conducted by nurses, mental health clinicians, social workers, or others with specialized training.

The law does not specify how funds are to be allocated to eligible entities in the states and territories. In practice, HRSA distributes Federal Home Visiting Program funds by both formula and competitive awards and, on its face, the funding formula treats states and territories the same. Between Fiscal Year 2010 and Fiscal Year 2015, funding was distributed according to the relative share of children under age five in families at or below 100 percent of the federal poverty line living in each state and territory. However, the poverty data are derived from the U.S. Census Bureau's Small Area Income Poverty Estimates (SAIPE), which are not available for the territories. There was a \$1 million funding minimum for state and territory grantees, and HRSA allocated this minimum level of funding to each of the territories from Fiscal Year 2011 through Fiscal Year 2015.

For Fiscal Year 2016, HRSA redesigned the funding allocation for formula grants. About one-third of funding is still allocated based on the share of children under age five in families at or below 100 percent of the federal poverty line in each state and territory, using 2013 SAIPE data that are not available for the territories. About two-thirds of funding is allocated based on the amount of competitive awards a state or territory received under the Federal Home Visiting Program between Fiscal Year 2013 and Fiscal Year 2015. There continues to be a \$1 million funding minimum for state and territory grantees, and each territory received the base allocation of \$1 million in Fiscal Year 2016.

The Task Force makes the following recommendation:

- The Task Force recommends that the **Health Resources and Services Administration**, when allocating funds to Puerto Rico under the Federal Home Visiting Program, utilize an appropriate alternative source for child poverty data, such as the Puerto Rico Community Survey, given that the data source currently used by HRSA to make allocations—the U.S.

Census Bureau's Small Area Income Poverty Estimates (SAIPE)—does not include the territories.

## 2. Federal Tax Policy

### A. Federal Tax Policy Toward Individuals and Families

The Task Force examined federal tax policy toward individuals and families residing in Puerto Rico and the other U.S. territories. The Task Force, which was directed by Section 409(g)(2) of PROMESA to recommend changes to federal law that could spur economic growth, reduce child poverty and attract investment to Puerto Rico, is making a specific recommendation related to the child tax credit. The Task Force is also making a broader recommendation on the subject of federal tax policy toward individuals and families in the territories to help guide federal policymakers going forward.

Under current law, the child tax credit (CTC) allows a family to reduce its federal tax liability—the taxes owed before tax credits are applied—by a maximum of \$1,000 per child. The CTC phases out for higher-income families.<sup>37</sup>

The CTC is refundable, meaning that if the value of the credit exceeds the amount of tax a family owes, the family may be eligible to receive a full or partial refund of the difference. The refundable portion of the credit is often called the additional child tax credit (ACTC). Families may receive the child tax credit as a reduction in tax liability (the non-refundable portion of the credit), a refundable credit (the ACTC), or a combination of both. For example, a family with two qualifying children and a tax liability of \$1,500 may receive the \$2,000 child tax credit (\$1,000 per child) as a \$1,500 reduction in their tax liability and a \$500 refund.

In the states and the District of Columbia, the amount of the ACTC is generally calculated using the earned income formula. Under this formula, a family may claim an ACTC equal to 15 percent of the family's earnings in excess of \$3,000, not to exceed the maximum credit amount (\$1,000 multiplied by the number of qualifying children). For example, a three-child family with annual earnings of \$20,000 would be eligible for an ACTC of \$2,550:  $[(\$20,000 - \$3,000) \times .15]$ .

Families with three or more children in the states and the District of Columbia may choose to calculate the ACTC using either the earned income formula or an alternative formula. The alternative formula is the family's federal payroll taxes (7.65 percent of earnings) minus the value of any earned income tax credit (EITC) the family received, not to exceed the maximum credit amount (\$1,000 multiplied by the number of qualifying children). In the relatively

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<sup>37</sup> See Section 24 of the Internal Revenue Code.

infrequent event that the ACTC calculated under the alternative formula is larger than the ACTC calculated under the earned income formula, the larger credit can be claimed, but the credit can never exceed \$1,000 per qualifying child.

Under current law, families in Puerto Rico with one child or two children are generally not eligible for the ACTC. While families in Puerto Rico with three or more children are eligible for the ACTC, they must calculate their credit using the alternative formula, which caps the ACTC at the amount of annual federal payroll taxes the family pays. This is in contrast to their stateside counterparts, who can calculate their credit using either the earned income formula or the alternative payroll tax formula.

Families in Puerto Rico with three or more children claim the ACTC by filing [Form 1040-SS](#) directly with the Internal Revenue Service within the U.S. Department of the Treasury. The [Form](#) and accompanying [instructions](#) both make explicit that the ACTC can only be claimed by island families with three or more children.

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** amend Section 24 of the Internal Revenue Code to authorize otherwise eligible families in Puerto Rico with one child or two children to claim the additional child tax credit, with the amount of the credit equal to the amount of annual federal payroll taxes paid by the family or \$1,000 per qualifying child, whichever is lower.<sup>38</sup> This legislative change will provide the same treatment to families in Puerto Rico with one child or two children that is currently provided to island families with three or more children, reducing incentives for island families with less than three qualifying children to claim on Form 1040-SS that they have three or more qualifying children in order to receive the ACTC. It has been estimated that this proposal could benefit about 355,000 newly-eligible families and 404,000 newly-eligible children in Puerto Rico, with an average credit for all Puerto Rico families of \$770, which will help reduce child poverty on the island.
- Although the Task Force reached consensus on the child tax credit, the Task Force does not intend to foreclose debate on whether further modifications to federal tax policy toward individuals and families in Puerto Rico may be appropriate. To the contrary, the Task Force recommends that **Congress** carefully consider this topic. Potential options for examination include: (1) authorizing Puerto Rico families to claim the additional child tax credit using the earned income formula, not merely the alternative payroll tax formula; (2) extending the

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<sup>38</sup> The Task Force recommends that Congress make a functionally equivalent legislative change for American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands.

earned income tax credit to eligible Puerto Rico households,<sup>39</sup> and (3) providing federal wage subsidies to employees and employers in Puerto Rico.<sup>40</sup>

Because the Task Force received numerous recommendations to extend the earned income tax credit (EITC) to Puerto Rico, the Task Force will address this topic briefly even though no consensus was reached. While there is some disagreement among Task Force members regarding the appropriateness of extending the EITC to workers in Puerto Rico, there is agreement that Puerto Rico's low labor force participation rate significantly contributes to the island's economic and fiscal problems. Studies have shown that the EITC increases labor force participation and reduces child poverty, but may have other effects on work incentives in phase-out ranges.

As noted elsewhere in the report, members of the Task Force understand that residents of Puerto Rico are not required to pay federal income taxes on their Puerto Rico-source income. However, like many of their fellow American citizens in the 50 states and the District of Columbia who receive the EITC and do not earn enough to incur a federal income tax liability, workers in Puerto Rico are subject to all federal payroll taxes. Notwithstanding the current absence of consensus, members of the Task Force agree that extension of the EITC to Puerto Rico both poses challenges and presents opportunities, and recommends that Congress explore ways to minimize the challenges and maximize the opportunities.

## **B. Other Federal Tax Provisions**

### **I. Cover Over of Rum Excise Tax Revenues to Puerto Rico and the U.S. Virgin Islands**

Federal excise taxes collected on rum produced in Puerto Rico and transported to the states are covered over—paid—to the treasury of Puerto Rico, and federal excise taxes collected on rum produced in the U.S. Virgin Islands and transported to the states are covered over to the treasury of the U.S. Virgin Islands. In addition, federal excise taxes collected on rum imported to the United States from foreign countries are covered over to Puerto Rico and the U.S. Virgin Islands pursuant to a formula established by the Alcohol and Tobacco Tax and Trade Bureau within the U.S. Department of the Treasury.<sup>41</sup> The primary purpose of the cover-over program is to help

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<sup>39</sup> See S. 2203, Earned Income Tax Credit and Child Tax Credit Equity for Puerto Rico Act of 2015 (114<sup>th</sup> Congress; Sen. Menendez); and H.R. 3553, Earned Income Tax Credit Equity for Puerto Act of 2015 (114<sup>th</sup> Congress; Rep. Pierluisi).

<sup>40</sup> See S. 3503, Economic Mobility for Productive Livelihoods and Expanding Opportunity (EMPLEO) Act (114<sup>th</sup> Congress; Sen. Rubio).

<sup>41</sup> See Section 7652 of the Internal Revenue Code.

the two territories provide essential public services. The use of funding for public purposes is particularly critical now that the government of Puerto Rico is struggling to fund its health, education and public safety systems.

Federal excise taxes are imposed on rum at the generally applicable distilled spirits rate of \$13.50 per proof gallon.<sup>42</sup> Under current law, excise tax collections on imported rum, including rum produced in Puerto Rico and the U.S. Virgin Islands, are covered over to Puerto Rico and the U.S. Virgin Islands at the rate of \$13.25 per proof gallon. Of this amount, \$10.50 per proof gallon is in permanent law and the remaining \$2.75 per proof gallon requires periodic reauthorization by Congress as part of tax extenders legislation. The additional \$2.75 per proof gallon was most recently extended through December 31, 2016 as part of the Consolidated Appropriations Act, 2016 (P.L. 114-113).

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** make the full amount of the rum cover-over payment to Puerto Rico and the U.S. Virgin Islands permanent, rather than permanent in part and subject to tax extenders legislation in part. The Task Force further recommends that Congress increase the cover-over payment from the current rate of \$13.25 per proof gallon to the generally applicable distilled spirits rate, currently \$13.50 per proof gallon. At a minimum, the Task Force recommends that Congress extend the additional \$2.75 per proof gallon component of the rum cover-over payment beyond 2016. Failure to extend the provision will cause harm to Puerto Rico's (and the U.S. Virgin Islands') fiscal condition at a time when it is already in peril.

## II. Domestic Production Activities in Puerto Rico

The domestic production activities deduction, also known as the domestic manufacturing deduction, was established as part of the American Jobs Creation Act of 2004 (P.L. 108-357).<sup>43</sup> Under current law, Section 199 allows a company to receive a deduction equal to 9 percent of the taxable income that the company derives from "qualified production activities" within the United States. This effectively reduces the top federal tax rate that a company will pay on such income from 35 percent to 32 percent. "Qualified production activities" include, among other things: manufacturing; electricity, natural gas and water production; film production; and construction. Overall, about one-third of corporate activity nationwide qualifies for the deduction.

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<sup>42</sup> See Section 5001 of the Internal Revenue Code.

<sup>43</sup> See Section 199 of the Internal Revenue Code; see also [Federal Tax Law And Issues Related To The Commonwealth Of Puerto Rico](#), Joint Committee on Taxation, September 28, 2015 (JCX-132-15).

Although the American Jobs Creation Act of 2004 did not authorize a company to receive the Section 199 deduction on income derived from qualified production activities within Puerto Rico, the Tax Relief and Healthcare Act of 2006 (P.L. 109-432) expanded Section 199 to include activities in Puerto Rico. However, the provision extending the Section 199 deduction to Puerto Rico applies on a temporary basis and therefore requires periodic reauthorization by Congress through tax extenders legislation. The provision has been extended five times since 2006, most recently in the Consolidated Appropriations Act, 2016 (P.L. 114-113), and is scheduled to expire on December 31, 2016. The Section 199 deduction is only available to U.S. companies that operate in Puerto Rico in branch form, which—in contrast to U.S. companies that operate in Puerto Rico in subsidiary form—are subject to full U.S. tax on the income from those operations on an immediate basis.

The Task Force makes the following recommendation:

- As long as the Section 199 domestic production activities deduction remains part of U.S. tax law, the Task Force believes that it should apply in Puerto Rico, a U.S. jurisdiction home to American workers. The Task Force recommends that **Congress** amend Section 199 so that it applies to Puerto Rico on a permanent basis. At a minimum, the Task Force recommends that Congress—for the sixth time since 2006—extend the provision beyond 2016. Failure to extend the provision will create a disincentive for existing and new U.S. businesses to conduct manufacturing operations in Puerto Rico, an outcome that Congress should seek to avoid.

### **III. Special Expensing Rules for Film and Television Productions**

Section 181 of the Internal Revenue Code allows a U.S. taxpayer to immediately deduct the cost of a qualified film, television, or live theatrical production, up to \$15 million (or \$20 million in the case of a production in certain low-income or economically distressed areas). This provision was most recently extended in the Consolidated Appropriations Act, 2016 (P.L. 114-113), and is scheduled to expire on December 31, 2016. To be a “qualified production,” 75 percent of the total compensation of the production must be “qualified compensation.”<sup>44</sup> The term “qualified compensation” is defined as “compensation for services performed in the United States by actors, directors, producers, and other relevant production personnel.”<sup>45</sup> The term “United States” means the 50 states and the District of Columbia, not Puerto Rico or the other U.S. territories.<sup>46</sup>

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<sup>44</sup> See Section 181(d)(1).

<sup>45</sup> See Section 181(d)(3).

<sup>46</sup> See [Treasury Regulation Section 1.181-3\(d\)](#), September 30, 2011.

The Task Force makes the following recommendation:

- As long as Section 181 remains part of U.S. tax law, the Task Force recommends that **Congress** amend Section 181 to include Puerto Rico and the other territories within the definition of “United States.” The Task Force believes that Puerto Rico should have the same opportunity as the 50 states and the District of Columbia to generate economic activity and employment opportunities through film, television, and theatrical production, and notes that the ability to showcase local culture and scenery before global film and television audiences can significantly stimulate tourism.

### C. Federal Tax Policy Toward Businesses

As long as Puerto Rico remains a U.S. territory, and not a state or a sovereign nation, there will be a vigorous debate regarding how businesses with activities in Puerto Rico should be taxed by the federal government.

This debate has historical, philosophical and public policy dimensions. The debate is historical because there continues to be a dispute over the impact of a now-repealed provision in the Internal Revenue Code, the Section 936 “Puerto Rico and Possession Tax Credit,” which was enacted in 1976 and fully phased out by 2006.

Section 936 provided tax preferences for territory activities, enabling U.S. corporations to pay preferred rates on income generated by their Puerto Rico affiliates, thereby creating a “substantial incentive for U.S. investment in [Puerto Rico].”<sup>47</sup> Some assert that enactment of Section 936 was critical in promoting economic development in Puerto Rico and that its repeal was detrimental to economic growth and investment on the island.<sup>48</sup> Others argue that the economic benefits for Puerto Rico of Section 936 were overstated and inefficient. Critics of 936 point to a GAO study which found that tax benefits to corporations often exceeded wages paid, sometimes by a ratio of more than two to one.<sup>49</sup> The GAO report noted that, while Section 936

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<sup>47</sup> See Sean Lowry, [Tax Policy and U.S. Territories: Overview and Issues for Congress](#), Congressional Research Service, October 7, 2016, at page 15; see also [Federal Tax Law And Issues Related To The Commonwealth Of Puerto Rico](#), Joint Committee on Taxation, September 28, 2015 (JCX-132-15).

<sup>48</sup> See, e.g., Hon. Alejandro García Padilla, Submission to Congressional Task Force on Economic Growth in Puerto Rico; and Puerto Rico Private Sector Coalition, Submission #1 to Congressional Task Force on Economic Growth in Puerto Rico.

<sup>49</sup> See [Puerto Rico and the Section 936 Tax Credit](#), Government Accounting [subsequently, Accountability] Office, June 8, 1993 (GAO-93-109), at pages 4, 5, 9 (observing that “[s]ignificant debate continues over the effectiveness of section 936 as an impetus for development in Puerto Rico,” and noting “[c]oncerns about the tax benefits in relation to employment” on the island).

provided substantial incentive for U.S. investment in Puerto Rico, “an increasing portion of total income produced in Puerto Rico [went] to U.S. and foreign investors [rather] than to Puerto Rican residents.”<sup>50</sup> In light of these and other data, some economists have argued that the decline of manufacturing jobs in Puerto Rico coincided with the repeal of Section 936, but was primarily attributable to other factors, including automation and other technological advancements at manufacturing facilities, increased import competition from other countries, and the reduction in manufacturing employment nationwide.<sup>51</sup>

Naturally, the debate over previous and current federal business tax policies toward Puerto Rico affects the debate over what federal tax policy toward Puerto Rico should be pursued by the next Congress. Speaking generally, those with more positive views toward Section 936 tend to look more favorably upon the prospect of a new tax incentive targeted at Puerto Rico, while those with more neutral or negative views toward Section 936 tend to look more skeptically upon the prospect of a new tax incentive aimed at the island. Those in the latter category do not necessarily oppose a new federal tax policy to encourage investment in Puerto Rico, but prefer that it be a policy of general applicability designed to encourage investment in economically-distressed areas throughout the country, including but not limited to Puerto Rico.<sup>52</sup>

The Task Force makes the following recommendations:

- The Task Force believes that Puerto Rico is too often relegated to an afterthought in congressional deliberations over federal business tax reform legislation. The Task Force recommends that **Congress** make Puerto Rico integral to any future deliberations over tax reform legislation.
- The Task Force recommends that **Congress** continue to be mindful of the fact that Puerto Rico and the other territories are U.S. jurisdictions, home to U.S. citizens or nationals, and that jobs in Puerto Rico and the other territories are American jobs.

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<sup>50</sup> See [Puerto Rico and the Section 936 Tax Credit](#), Government Accounting [subsequently, Accountability] Office, June 8, 1993 (GAO-93-109), at page 12.

<sup>51</sup> See, e.g., Arthur MacEwan and J. Tomas Hexner, Submission #6 to Congressional Task Force on Economic Growth in Puerto Rico.

<sup>52</sup> See, e.g., Arthur MacEwan and J. Tomas Hexner, Submission #2 to Congressional Task Force on Economic Growth in Puerto Rico (urging Congress to enact legislation establishing “Investment Zones” in order to “supply a strong incentive for firms to establish new operations and expand existing operations in those economically depressed areas of the country”; noting that this legislation “would apply to the whole country as a national policy, [but] the benefits to Puerto Rico would be especially large”).

- The Task Force is open to the prospect of **Congress** providing U.S. companies that invest in Puerto Rico with more competitive tax treatment as long as appropriate guardrails are designed to ensure the company is creating real economic activity and employment on the island.

### 3. Energy

On September 30<sup>th</sup>, the Task Force held a staff-level briefing with officials from the U.S. Department of Energy (USDOE) to discuss Puerto Rico’s electricity generation and distribution system. There is a consensus that the high cost and low reliability of electric power in Puerto Rico is one of the most serious challenges confronting households and businesses, and a significant obstacle to economic growth on the island.<sup>53</sup>

Puerto Rico has no conventional energy resources, and relies heavily on shipments of imported fuel to generate electricity. According to the U.S. Energy Information Administration (EIA) [profile](#) on Puerto Rico, in 2015 Puerto Rico generated 51 percent of its electricity from petroleum, 31 percent from natural gas, 16 percent from coal, and 2 percent from renewable sources (predominantly wind, solar and hydropower). The numbers provided by the Puerto Rico Electric Power Authority (PREPA) are different than the EIA numbers, and appear to indicate that Puerto Rico currently generates close to 62 percent of its electricity from petroleum and less than 19 percent from natural gas. To place this in context, according to the [EIA](#), in 2015 the 50 states and the District of Columbia generated 33 percent of their electricity from natural gas, another 33 percent from coal, 20 percent from nuclear, 13 percent from renewable sources, and only 1 percent from petroleum.<sup>54</sup> Few, if any, observers question the conventional wisdom that Puerto Rico should take steps to reduce its disproportionate reliance on petroleum and increase its use of natural gas—of which the United States is now the world’s largest producer—and renewable energy sources like solar power if economically viable.<sup>55</sup>

The price of electricity in Puerto Rico is high, while the ability of some residents of Puerto Rico—where the median annual income is \$18,626—to pay is low. According to the EIA, the average price of electricity sold to the residential sector in Puerto Rico between 2005 and 2015

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<sup>53</sup> See, e.g., William C. Dudley, President and Chief Executive Officer, Federal Reserve Bank of New York, “[Opportunities for Economic Growth in Puerto Rico](#),” November 29, 2016.

<sup>54</sup> According to the EIA, American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands generate all or nearly all of their electricity from imported petroleum.

<sup>55</sup> See, e.g., the EIA [profile](#) of Hawaii (“In 2015, Hawaii generated more solar electricity per capita from distributed facilities than any other state, and solar energy from both utility-scale and distributed resources generated 35% of Hawaii’s renewable electricity.”).

was 20.5 cents per kilowatt hour, peaking at 30.6 cents per kilowatt hour in February 2013.<sup>56</sup> Currently, the price of electricity for residential customers in Puerto Rico is higher than the price of electricity in any of the 48 contiguous states, roughly the same as the price in Alaska, and lower than the price in Hawaii (27.45 cents per kilowatt hour in August 2016).<sup>57</sup>

The price of electricity in Puerto Rico is also volatile, rising or falling based on the shifting price of crude oil in the world market, whereas the price of electricity in the United States is relatively stable.<sup>58</sup> In addition to its high and variable cost, electricity in Puerto Rico is subject to periodic supply disruptions.<sup>59</sup>

Puerto Rico's energy system is dominated by the Puerto Rico Electric Power Authority (PREPA), a public corporation in deep financial distress. PREPA owns and operates all but two of the power plants in Puerto Rico and controls the island's transmission grid. PREPA has often operated inefficiently and been governed in an opaque manner. Long overdue efforts are underway to reform operations at PREPA and, while progress has been made, it is clear that additional progress is required.<sup>60</sup>

Puerto Rico did not have an electricity regulatory body to oversee PREPA or regulate electricity rates until May 2014, when a law was enacted establishing the [Puerto Rico Energy Commission](#)

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<sup>56</sup> In this same time period, the average price of electricity sold to the residential sector in the 50 states and the District of Columbia was 11.4 cents per kilowatt hour.

<sup>57</sup> See EIA, Rankings: Average Retail Price of Electricity to Residential Sector, August 2016.

<sup>58</sup> See [Report by the President's Task Force on Puerto Rico's Status](#), March 2011, at page 71 (“When the price of oil spikes, as it did in the summer of 2008, the effect on businesses and other consumers is devastating. Those high and unpredictable energy costs have made the Island less desirable for businesses, which, in turn, has contributed to a declining manufacturing base and increased unemployment. Moreover, Puerto Ricans have less disposable income because their utility bills are among the highest in the nation.”).

<sup>59</sup> For example, in late September 2016, a fire at a Puerto Rico Electric Power Authority (PREPA) power plant in southern Puerto Rico left virtually all of its customer base of 1.5 million households without power—some for several days—and caused major disruptions to the island's economy.

<sup>60</sup> See [Testimony](#) of Lisa Donahue, Hearing on “Exploring Energy Challenges and Opportunities Facing Puerto Rico, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, January 12, 2016.

(PREC).<sup>61</sup> The law required PREPA to prepare its first-ever [Integrated Resource Plan](#) (IRP), on terms established by PREC and subject to PREC’s approval.<sup>62</sup>

The Task Force makes the following recommendations:

- The Task Force believes that the Puerto Rico Electric Power Authority’s record of service has not inspired confidence among its customer base in Puerto Rico, and recommends that the **government of Puerto Rico** continue efforts to make operational reforms at PREPA, improve the efficiency of electricity generation and transmission, and diversify Puerto Rico’s energy supply—all with the ultimate goal of making electric power more reliable and affordable.
- The Task Force recommends that **PREPA** and the **Puerto Rico Energy Commission** seek technical assistance from the U.S. Department of Energy, and recommends that the **U.S. Department of Energy** (USDOE) provide all authorized forms of technical and financial assistance. The Task Force has been advised that PREPA and other government of Puerto Rico agencies have shown reluctance in the past to request technical assistance from USDOE, including during the September 2016 blackout, and the Task Force recommends that any such reluctance be set aside.
- In December 2014, Congress enacted the [Fiscal Year Consolidated and Further Continuing Appropriations Act, 2015](#) (P.L. 113-235). Section 9 of the law requires the Secretary of the Interior to appoint a team of technical, policy and financial experts to develop an “energy action plan” for each of the territories, including Puerto Rico. In Section 505(d) of PROMESA, Congress reassigned responsibility for crafting the plan for Puerto Rico from the U.S. Department of the Interior to the U.S. Department of Energy. The Task Force recommends that the **U.S. Secretary of Energy** appoint a team of experts as soon as practicable, but not later than the statutory deadline of March 27, 2017; that the team of experts prepare the energy action plan in a timely manner; that the U.S. Secretary of Energy publish the energy action plan on the U.S. Department of Energy’s website; and that the U.S. Secretary of Energy annually update Congress on the efforts that Puerto Rico has made to implement the energy action plan, as required by statute.

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<sup>61</sup> See [Puerto Rico Law 57-2014](#), the “Puerto Rico Energy Transformation and RELIEF Act.”

<sup>62</sup> On September 23, 2016, PREC issued its “[Final Resolution and Order](#),” disapproving the IRP submitted by PREPA, approving a modified IRP, ordering PREPA to modify the IRP in line with PREC’s requirements, and ordering PREPA “to ensure that its future IRPs comply with its legal obligations and satisfy professional standards.” For the complete PREC docket on this matter, see [here](#) (CEPR-AP-2015-0002).

- The Task Force recommends that the **U.S. Department of Energy** assess whether Puerto Rico receives equitable treatment relative to other jurisdictions under grant programs for energy-related research and, if it does not, recommends that USDOE resolve any inequities.

#### 4. Federal Statistical Programs

A federal statistical agency is an agency or unit of the executive branch whose primary activities are the collection and publication of information for statistical purposes. The principal federal statistical agencies include the:

- [U.S. Census Bureau](#), within the U.S. Department of Commerce;
- [Bureau of Economic Analysis \(BEA\)](#), within the U.S. Department of Commerce;
- [Bureau of Labor Statistics \(BLS\)](#), within the U.S. Department of Labor;
- [National Agricultural Statistical Service \(NASS\)](#), within the U.S. Department of Agriculture;
- [Economic Research Service \(ERS\)](#), within the U.S. Department of Agriculture
- [National Center for Education Statistics \(NCES\)](#), within the U.S. Department of Education;
- [Bureau of Justice Statistics \(BJS\)](#), within the U.S. Department of Justice;
- [National Center for Health Statistics \(NCHS\)](#), within the Centers for Disease Control and Prevention, within the U.S. Department of Health and Human Services;
- [Bureau of Transportation Statistics \(BTS\)](#), within the U.S. Department of Transportation;
- [National Center for Science and Engineering Statistics \(NCSES\)](#), within the National Science Foundation; and
- [U.S. Energy Information Administration \(EIA\)](#), within the U.S. Department of Energy.

Responsibility for coordinating the [federal statistical system](#) rests with the Office of Statistical and Science Policy (SSP), within the Office of Information and Regulatory Affairs, within the [Office of Management and Budget](#). SSP is led by the U.S. Chief Statistician.

The U.S. Chief Statistician seeks to ensure the effectiveness of the federal statistical system by, among other things, (1) establishing statistical policies and identifying priorities for improving statistical programs; (2) promoting integration across the federal statistical system by serving as chair of the Interagency Council on Statistical Policy, consisting of the principal statistical agencies; (3) annually preparing the “Statistical Programs of the United States Government” document, most recently released in September 2015 for [Fiscal Year 2016](#); and (4) preparing the “[Strengthening Federal Statistics](#)” chapter of the “Analytical Perspectives” volume of the President’s annual budget request to Congress.

As the “Strengthening Federal Statistics” chapter notes:

The ability of governments, businesses, and the general public to make informed choices about budgets, employment, investments, taxes, and a host of other important matters depends critically on the ready and equitable availability of relevant, accurate, timely, and objective Federal statistics. Taken together, the data produced by the decentralized Federal statistical system form a robust evidence base to support both public and private decision-making.

This view was echoed by William C. Dudley, the president and chief executive officer of the Federal Reserve Bank of New York, in a 2010 [speech](#) delivered in Puerto Rico:

The private and public sectors both need accurate, timely and comprehensive economic statistics to perform effectively. It is impossible to make good decisions without a solid factual basis for those decisions. For example, the government needs good economic information to develop effective fiscal, economic development and regulatory policy. Likewise, to make the best production, investment and pricing decisions, businesses need accurate and timely information on things such as wages, income and prices. Poor quality information increases uncertainty and this uncertainty inhibits well-considered risk-taking and investment decisions.

In its September 15<sup>th</sup> [status update](#), the Task Force wrote as follows:

Like other observers, the Task Force is concerned about the relative lack of reliable data pertaining to certain aspects of the economic, financial, and fiscal situation in Puerto Rico, which are necessary for productive analyses that may lead to sound public policy recommendations. Therefore, the Task Force intends to analyze the extent to which Federal statistical products that measure economic and financial activity in the states might also provide equivalent information for Puerto Rico and other territories, and the Task Force intends to explore ways in which any such data gaps can be responsibly closed.

On October 21<sup>st</sup>, the Task Force held a staff-level briefing with officials from three of the principal federal statistical agencies—the U.S. Census Bureau, the Bureau of Labor Statistics, and the National Agricultural Statistical Service. On October 26<sup>th</sup>, the Task Force held a staff-level briefing with officials from the Bureau of Economic Analysis (along with officials from other divisions within the U.S. Department of Commerce). The Task Force also communicated with the Bureau of Justice Statistics, which on September 14<sup>th</sup> sent a letter to a member of the Task Force regarding Puerto Rico’s treatment under BJS statistical programs. The Task Force received multiple written submissions that discuss this topic, including a letter from the executive director of the Puerto Rico Institute of Statistics.

Based on the information it obtained, the Task Force has confirmed that Puerto Rico—and, to an even greater extent, the four smaller U.S. territories, where sample sizes can pose a problem—are currently excluded from a considerable number of the statistical programs conducted by the principal federal statistical agencies, including some of the most important programs.

To help illustrate the point, **Appendix 3** contains a table prepared by the Task Force with the assistance of the U.S. Census Bureau that lists the main statistical programs (censuses and surveys) conducted by the Census Bureau, either on its own or in conjunction with another federal agency. The table describes whether the program collects and publishes state-by-state information and, if so, whether Puerto Rico information is included as well. If the program provides only national or regional level data, the table describes whether Puerto Rico is included in the national or regional totals.

The Task Force recognizes that a federal statistical agency may need to take a number of steps before it can include Puerto Rico in a particular statistical program from which it is presently excluded—including conducting a feasibility study, expending or reprogramming current agency funding or requesting additional funding from Congress, and obtaining cooperation and collaboration from local partners, such as the Puerto Rico Institute of Statistics and the Puerto Rico Planning Board. The Task Force understands that there may be certain impediments to action and that the effort may need to proceed in incremental fashion. However, the Task Force believes this to be a worthwhile endeavor that will benefit federal and local policymakers, current and potential investors, and the Puerto Rico public.

The Task Force makes the following recommendations:

- The Task Force recommends that the **U.S. Chief Statistician** place the subject of Puerto Rico’s inclusion in federal statistical programs on the agenda of the Interagency Council on Statistical Policy, develop an action plan consisting of short-term, medium-term, and long-term objectives, and describe this action plan in the “Statistical Programs of the United States Government” document submitted annually to Congress.
- The Task Force recommends that the **Census Bureau** take all reasonable steps to include Puerto Rico in its federal statistical programs, including the quinquennial Census of Governments (and its associated annual and quarterly surveys and summaries regarding public employment and payroll, public pensions, state government tax collections, and state and local government finances);<sup>63</sup> the Survey of Business Owners and Self-Employed

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<sup>63</sup> See, e.g., Federal Reserve Bank of New York, [An Update on the Competitiveness of Puerto Rico’s Economy](#), July 31, 2014, at page 11 (noting that “the Census of Governments does not survey Puerto

Persons (SBO); the Building Permits Survey (BPS), which is currently published monthly for the states but only annually for Puerto Rico; and the Quarterly Workforce Indicators (QWI).<sup>64</sup>

- Puerto Rico is excluded from Census Bureau statistical programs that provide information on housing, such as the American Housing Survey (AHS), the Construction Progress Reporting Survey (CPRS), the Housing Vacancy Survey (HVS), the Manufactured Housing Survey (MHS; conducted jointly with the U.S. Department of Housing and Urban Development), and the Value of Construction Put in Place Survey (VIP). The Task Force recommends that the **Census Bureau**, in coordination with the government of Puerto Rico, examine the feasibility of including Puerto Rico in some or all of these products, or identify alternative means of collecting and publishing reliable data on the housing market in Puerto Rico.
- The Task Force recommends that the **Census Bureau** ensure that the quinquennial Economic Census of Island Areas (IA), which does include Puerto Rico, is producing data that is roughly equivalent in terms of both substance and timing to the data produced by the quinquennial Economic Census, which does not include Puerto Rico. The Task Force further recommends that the Census Bureau assess whether it would be preferable to include Puerto Rico in the national Economic Census rather than the Census of Islands Areas.
- The Task Force recommends that the **Bureau of Labor Statistics** and the **Census Bureau** take all reasonable steps to include Puerto Rico and the other territories in the Current Population Survey (CPS), the primary source of labor statistics in the United States. The Task Force notes that Section 404 of PROMESA expresses the “Sense of Congress” that a study should be conducted to “determine the feasibility of expanding data collection to include Puerto Rico and the other United States territories” in the CPS and that, if necessary, the Census Bureau “should request the funding required to conduct this feasibility study as part of its budget submission to Congress for fiscal year 2018.” The Task Force notes that BLS and the Census Bureau worked with the Task Force to begin to determine the feasibility and costs of such expansion.
- Puerto Rico’s K-12 public education system falls short in numerous, troubling respects.<sup>65</sup> As described in the table in Appendix 2, funding for Puerto Rico is capped under various federal

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Rico as part of its annual program to collect information on the fiscal policies of the states and their constituent localities”).

<sup>64</sup> The Task Force notes that the Census Bureau recently added Puerto Rico to its web-based application, [My Congressional District](#), which was established in [2003](#) as a way to provide policymakers and the public with easy access to Census Bureau statistics about each congressional district.

education programs; nevertheless, according to CRS, Puerto Rico still receives more federal education funding per public elementary and secondary school student than any state or the District of Columbia (\$2,841 in school year 2012-2013). Given the importance of education, the Task Force recommends that the **National Center for Education Statistics** (NCES) collect and publish data for Puerto Rico in the same manner that it collects and publishes data for the states, to the greatest extent possible.<sup>66</sup>

- Although the agricultural sector in Puerto Rico is relatively small, with about 17,000 of the one million employed individuals on the island working directly in “farming, forestry and fishing,” the sector has grown in recent years according to local government statistics, and has the potential to expand further and create jobs.<sup>67</sup> The National Agricultural Statistical Service includes Puerto Rico in the Census of Agriculture, which was last produced in [2012](#) and will next be produced in 2017. The Task Force recommends that the **National Agricultural Statistical Service** include Puerto Rico in its relevant commodity surveys or that it identify an alternative method of producing reports on the island’s agricultural sector on at least an annual basis. The Task Force further recommends that NASS explore the feasibility of reestablishing a physical presence in Puerto Rico.
- As discussed elsewhere in this report, Puerto Rico has a higher homicide rate than any state, and the relative lack of public safety on the island undermines economic growth and quality of life. Puerto Rico is excluded from most statistical programs sponsored by the Bureau of Justice Statistics, including programs that provide information on crime victims, identity theft, prisoners and prisons, probationers, parolees, criminal justice expenditures, and contacts between the police and the public. The Task Force recommends that the **Bureau of Justice Statistics** take all reasonable steps to include Puerto Rico in its statistical programs.
- The National Survey on Drug Use and Health (NSDUH) is an annual survey funded by the Substance Abuse and Mental Health Services Administration (SAMHSA) within HHS, and it provides both state-level and national-level data on drug and substance abuse, among other

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<sup>65</sup> See, e.g., Federal Reserve Bank of New York, [Human Capital and Education in Puerto Rico](#), Liberty Street Economics, August 11, 2016; National Center for Education Evaluation and Regional Assistance, [A Comparison of Two Methods of Identifying Beating-the-Odds High Schools in Puerto Rico](#), December 2016.

<sup>66</sup> To cite one instance where this does not occur, NCES provides a [State Education Data Profile](#) on its website for each state and the District of Columbia, but not for Puerto Rico or the other territories. Although NCES does provide information on Puerto Rico elsewhere on its website, for example [here](#) and [here](#), the data furnished are not as extensive or user-friendly.

<sup>67</sup> See [Statistical Appendix](#), Puerto Rico Planning Board’s Fiscal Year 2015 Economic Report to the Governor and Legislative Assembly, at pages A-26, A-27, A-65; see also Danica Coto, [Puerto Rico Finds Unexpected Source of Growth in Agriculture](#), Associated Press, September 28, 2016.

topics. NSDUH data are used by multiple federal agencies, including by the National Guard Bureau to make annual allocations to state and territory national guards under the National Guard Counterdrug Program. Puerto Rico and the other territories are excluded from the NSDUH. The Task Force recommends that the **Substance Abuse and Mental Health Services Administration**, and the non-profit company it has selected to administer the NSDUH through Fiscal Year 2017, provide an update to the appropriate congressional committees on the status of its effort to include Puerto Rico and the other territories in this survey.

- Puerto Rico is excluded from a number of statistical programs conducted by the National Center for Health Statistics, such as the [National Health Interview Survey](#), which is the principal source of information on the health of the U.S. population. The Task Force recommends that the **National Center for Health Statistics** take reasonable steps to include Puerto Rico and the other territories in its programs, particularly when state-level data are produced.
- As discussed elsewhere in this report, the high cost and unreliability of electric power in Puerto Rico is a challenge facing island households and businesses, hampering economic growth. The Task Force notes that, while the U.S. Energy Information Administration website does provide information for Puerto Rico and the other territories in its “[State Profiles](#)” section, the information furnished for Puerto Rico is not as detailed or as up-to-date as the information furnished for the states. The Task Force recommends that the **U.S. Energy Information Administration** work to close the remaining data gaps.
- In its numerous meetings with federal agencies, the Task Force heard that the Puerto Rico Institute of Statistics, which was established under Puerto Rico law in 2003 but did not begin operating until 2007, has emerged as a highly professional, autonomous, and apolitical organization that is bringing greater transparency to economic, financial and fiscal conditions on the island. Recognizing that the government of Puerto Rico faces a difficult fiscal environment, the Task Force recommends that the **government of Puerto Rico** consider appropriating a level of funding to the Puerto Rico Institute of Statistics that is commensurate with its important responsibilities. The Task Force also recommends that the **Institute of Statistics** continue to protect its independence and take all feasible steps to publish its products in English in addition to Spanish so these products can have the widest possible audience.

## 5. Support for Small Businesses

The Small Business Administration (SBA) promotes the interests of small businesses. SBA has 10 regional offices, and Puerto Rico—along with New York, New Jersey, and the U.S. Virgin

Islands—fall within [Region II](#), which is based in New York. SBA has a [district office](#) in Puerto Rico, which currently has 12 employees, and also covers the U.S. Virgin Islands.

On September 20<sup>th</sup>, the Task Force held a staff-level briefing with officials from the SBA. In addition, the Task Force received numerous submissions via the email portal from small business owners in Puerto Rico, from trade organizations representing small businesses on the island, and from national-level associations with an interest in SBA programs, namely the National Association of Development Companies and the National Association of Government Guaranteed Lenders.

Small firms play a significant, and often underappreciated, role in Puerto Rico's economy. According to the [Office of Advocacy](#) at the SBA, about 80 percent of private sector workers in Puerto Rico are employed at small establishments, which is slightly higher than the percentage in the U.S. mainland. Specifically, there are about 553,000 workers employed by about 45,000 small businesses. Each year for the last decade or so, the number of Puerto Rico establishments that started up (hired at least one employee for the first time) has been less than the number of establishments that exited (went from having at least one employee to having none, and remained closed for at least a year).

The SBA administers a range of programs to support small businesses, including capital access programs to help small firms obtain loans and other forms of capital; procurement programs to help small firms compete more effectively for federal government contracts; and entrepreneurial development programs to provide small firms with training and technical assistance.

There are presumably many small businesses in Puerto Rico operating in the informal economy, and therefore not subject to regulation or taxation. An objective of ongoing economic reforms in Puerto Rico should be to incentivize small firms to move from the informal to the formal economy, and it should be noted that SBA programs are only available to small firms operating in the formal economy.

#### **A. SBA Capital Access Programs**

Outside of its disaster assistance program, the SBA does not make direct loans to businesses. Instead, the agency typically guarantees loans made by approved private sector lenders to small firms that cannot obtain affordable credit elsewhere, or it makes direct loans to non-profit intermediaries that, in turn, make loans to small firms. The SBA's largest loan programs include the 7(a) loan guaranty program, the 504/Certified Development Company (504/CDC) loan guaranty program, and the Microloan program.

The Task Force believes that, for a variety of structural and other reasons, these programs are not producing satisfactory results in Puerto Rico. The Task Force believes that Congress and the SBA should take steps to improve the operation of these programs in Puerto Rico. The Task Force further believes that these steps should be targeted, should safeguard the effective operation and financing of these programs on the national level, and should be temporary in duration, *expiring when the Oversight Board established by PROMESA terminates*. The Task Force also believes these steps should be made applicable to the four other territories wherever feasible.

The Task Force makes the following recommendations:

- Under the 7(a) program, loans are made by SBA partners—mostly banks, but also some other financial institutions—and are partially guaranteed by the SBA. Proceeds from 7(a) loans may be used to establish a new business or to operate, acquire, or expand an existing business. The SBA’s current guaranty rate is 85 percent for loans of \$150,000 or less and 75 percent for loans greater than \$150,000. The Task Force recommends that **Congress** enact legislation to increase the guaranty rate and require a separate subsidy calculation for 7(a) loans made in Puerto Rico.
- The SBA generally assesses a fee on loans it guarantees under the 7(a) program, based on the loan’s maturity date and the dollar amount guaranteed. The lender initially pays the fee and may pass that expense on to the small business borrower at closing. The Task Force recommends that **Congress** direct the SBA to waive or reduce this fee in the case of a lender who makes an approved 7(a) loan to a borrower located in Puerto Rico.
- The 504/CDC loan guaranty program utilizes Certified Development Companies, which are private, nonprofit corporations established to contribute to economic development within their communities. Under the 504/CDC program, a commercial lender provides up to 50 percent of the financing, the CDC provides up to 40 percent of the financing (by issuing SBA-guaranteed debentures), and the small business contributes at least 10 percent of the financing—essentially a “down payment.” The Task Force recommends that, in the case of small businesses in Puerto Rico, **Congress** consider reducing the small business contribution and increasing the CDC contribution.
- Under the 504/CDC program, the SBA is authorized to charge CDCs five fees to help recoup the SBA’s expenses, including a participation fee. For their part, CDCs are authorized to charge borrowers a variety of fees, including a processing fee. The Task Force recommends that Congress direct the SBA to waive the participation fee that the SBA charges to CDCs located in Puerto Rico and/or to waive the processing fee that those CDCs charge to borrowers on the island.

- Under the Microloan program, the SBA provides direct loans to qualified nonprofit intermediary lenders that, in turn, provide loans of up to \$50,000 to small firms. Under current law, an intermediary in the Microloan program may not borrow more than \$750,000 in the first year of participation in the program and, in later years, the intermediary's obligation to the SBA may not exceed an aggregate of \$5 million. The Task Force recommends that **Congress** consider increasing that aggregate limit in the case of intermediaries located in Puerto Rico.
- In Fiscal Year 2016, the SBA received \$25 million in appropriations from Congress to make grants to Microloan intermediaries to provide Microloan borrowers and prospective borrowers with technical assistance. Under current law (known as the "25/75 rule"), no more than 25 percent of Microloan technical assistance grant funding received by an intermediary from the SBA may be used by the intermediary to provide pre-loan assistance (assistance to a prospective Microloan borrower), as opposed to post-loan assistance (assistance to an approved Microloan borrower). The Task Force recommends that **Congress** authorize an intermediary in the Microloan program to use more than 25 percent of its SBA-provided technical assistance grants on pre-loan assistance if the intermediary provides at least 25 percent of its loans to small firms in Puerto Rico.
- Should the new lending authority recommended in this section be enacted, the Task Force recommends that the **SBA** and the **Government Accountability Office** conduct regular and rigorous oversight of the effectiveness of this expansion.

## B. SBA Procurement Programs

The federal procurement process is the process whereby federal agencies acquire supplies and services for the agency's use or benefit. Government-wide and agency-specific goals for the percentage of contract and subcontract dollars awarded to small businesses have long been part of the federal procurement process. Congress has enacted, and the SBA administers, various programs to help small firms obtain and perform federal contracts and subcontracts. These include the 8(a) program for businesses owned by persons who are socially and economically disadvantaged, the Historically Underutilized Business Zone (HUBZone) program, the Women-Owned Small Business program, and the Service-Disabled Veteran-Owned Small Business program. By some metrics, Puerto Rico ranks low with respect to its participation in the federal procurement process.<sup>68</sup>

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<sup>68</sup> According to the 2016 edition of the [Annual Review of Government Contracting](#), federal spending on procurement contracts totaled \$439.6 billion in Fiscal Year 2015. The Annual Review includes a table that ranks all 56 U.S. jurisdictions—the 50 states, the District of Columbia, and the five territories—by the total dollar value of federal contracts performed within each jurisdiction in Fiscal Year 2015. Puerto Rico ranks 50<sup>th</sup>, with \$430.6 million—\$307 million in defense contracts and \$123.6 million in non-defense contracts—performed on the island. The three states and three territories that fall below Puerto

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** consider establishing a contracting preference for small businesses in Puerto Rico with respect to federal contracts performed in Puerto Rico.<sup>69</sup>
- The SBA administers a mentor/protégé program. The program provides benefits to both the mentor firm and the protégé firm. In the case of the protégé, the relationship is designed to help the protégé firm better compete for federal contracts and subcontracts, including through joint venture arrangements with the mentor firm, and to otherwise enhance the capabilities of the protégé firm. Mentor firms can be businesses of any size that are in good financial standing and can impart knowledge to the protégé firm regarding general business operations and government contracting. Protégé firms must meet certain criteria as well. Typically, a mentor has one protégé at a time, but can have up to two or three if the mentor can demonstrate that the additional relationship(s) will not adversely affect the development of any of the protégé firms. Current federal law prohibits a mentor from having more than three protégés. The Task Force recommends that **Congress** authorize an exception to this three-protégé rule if the protégé firms are located in Puerto Rico or another territory.

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Rico each has a smaller population than Puerto Rico. When the total dollar value of federal contracts performed in each jurisdiction is calculated on a per capita basis, Puerto Rico ranks 55<sup>th</sup>, ahead of only American Samoa. Furthermore, according to the [Federal Procurement Data System](#), of the 571 federal contracts that were performed in Puerto Rico in Fiscal Year 2015, 346 (approximately 61 percent) were awarded to firms located outside of Puerto Rico. The Task Force selected three states to serve as points of comparison, and asked CRS to run the searches of the Federal Procurement Data System. Of the 30,501 federal contracts performed in Oregon—which has a similar-sized population to Puerto Rico—in Fiscal Year 2015, 5,445 (18 percent) were awarded to firms located outside of Oregon. Of the 23,005 federal contracts performed in Mississippi in Fiscal Year 2015, 7,321 (32 percent) were awarded to firms located outside of Mississippi. Of the 96,463 federal contracts performed in Washington State in Fiscal Year 2015, 13,271 (14 percent) were awarded to firms located outside of Washington.

<sup>69</sup> Congress has the authority to require federal agencies to preference local contractors in connection with the awarding of federal contracts under certain circumstances, and Congress has exercised that authority on occasion. For example, the Robert T. Stafford Disaster Relief Act establishes a contracting preference for “organizations, firms, and individuals residing or doing business primarily in the area affected by [a] major disaster or emergency.” In addition, Section 15 of the Small Business Act requires that federal agencies give “priority” to small businesses that perform a substantial proportion of the production “within areas of concentrated unemployment or underemployment or within labor surplus areas” when setting aside contracts for small businesses. The Task Force is concerned that, on a per capita basis, the total dollar value of federal contracts performed in Puerto Rico is less than in any U.S. jurisdiction other than American Samoa. The Task Force is also concerned that, of the small number of federal contracts that are performed in Puerto Rico, about 6 of every 10 are awarded to firms outside of Puerto Rico.

### C. Small Business Innovation Research and Technology Transfer Programs

The Small Business Innovation Research (SBIR) program is designed to increase the participation of small innovative companies in federally-funded research and development. Federal agencies with extramural R&D budgets of \$100 million or more set aside a portion of these funds to finance an agency-run SBIR program that makes competitive awards to small businesses. Currently, 11 federal agencies participate in the SBIR program. Another competitive grant program, the Small Business Technology Transfer (STTR) program, facilitates the commercialization of university and federal R&D by small companies. Federal agencies with extramural R&D budgets of \$1 billion or more set aside a portion of these funds to finance an agency-run STTR program. Currently, five agencies participate in the STTR program. The SBA helps to coordinate the SBIR and STTR programs.

As of Fiscal Year 2014, federal agencies had made more than 133,000 awards totaling \$33.7 billion under the SBIR and STTR programs. However, according to the SBA's [website](#), Puerto Rico firms have received only 30 awards (26 SBBR awards and 4 STTR awards) totaling \$5.5 million, and no firms in any other territory have received any awards. Each state has received many more awards than Puerto Rico. Particularly in light of the number of science, technology, engineering and mathematics (STEM) professionals in Puerto Rico, the paucity of SBBR and STTR awards to small firms on the island is concerning.

In addition, the SBA administers the Federal and State Technology (FAST) partnership program, a competitive grant program that aims to help socially and economically disadvantaged firms compete in the SBIR and STTR programs. The program began in Fiscal Year 2001, expired at the end of Fiscal Year 2005, and was reestablished in Fiscal Year 2010. Pursuant to the FAST program, the SBA provides annual awards to state and local economic development agencies, business development centers, and colleges and universities, who use this funding to provide assistance to science-driven and technology-driven small businesses, including assistance to help them compete for SBIR and STTR awards. FAST grantees are required to meet a local matching requirement, which ranges from 50 cents for every \$1 in federal funding received (in the case of states and territories, such as Puerto Rico, with the fewest SBIR and STTR awards) to \$1 dollar for every \$1 in federal funding (in the case of states and territories with the most SBIR and STTR awards). Since the FAST program was reestablished in 2010, two Puerto Rico entities have received grants—the InterAmerican University of Puerto Rico and the Puerto Rico Trade and Export Company, a government-owned corporation. However, in Fiscal Year 2016, no Puerto Rico entity was awarded a FAST grant.

The Task Force makes the following recommendation:

- The Task Force recommends that **Congress** require the SBA to make an annual FAST partnership grant to a Puerto Rico grantee, and to waive the local matching requirement. If the SBA cannot find a suitable grantee, the Task Force recommends that Congress require the SBA to use the funding to help small businesses in Puerto Rico navigate the SBIR and STTR process, from application, to award, to successful completion of each phase of the program.

#### **D. SBA Disaster Assistance**

The SBA provides assistance to help individuals and businesses affected by disasters. Assistance is provided in the form of loans that must be repaid, rather than grants. As distinct from the SBA's other lending programs, disaster assistance loans are made directly by the SBA to the borrower.

Under current law, the term “disaster” means a “sudden event which causes severe damage.” It can include events like hurricanes, earthquakes, tornadoes, fires, floods, droughts, oil spills, and civil disorders.<sup>70</sup> The SBA's disaster loan program includes economic injury disaster loans (EIDLs). EIDLs are available to businesses located in a declared disaster area, that have suffered substantial economic injury, are unable to obtain credit elsewhere, and are defined as small by SBA size regulations, which vary from industry to industry. Substantial economic injury occurs where “the business concern is unable to meet its obligations as they mature or to pay its ordinary and necessary operating expenses.” The maximum loan amount for an EIDL is \$2 million. Loan proceeds can be used for working capital necessary to enable the business to alleviate the specific economic injury and to resume normal operations. The loan can have a maturity of up to 30 years and has an interest rate of 4 percent or less.

Over the past year, the United States, including Puerto Rico and other territories, has been adversely affected by Zika, a mosquito-borne virus that has been linked to birth defects and other severe health problems. To date, three U.S. territories—Puerto Rico, the U.S. Virgin Islands, and American Samoa—and two states—Florida and Texas—have experienced locally-acquired cases of Zika, and nearly every state and territory has experienced travel-associated cases of Zika. Puerto Rico is, by far, the most affected U.S. jurisdiction. According to the [Centers for Disease Control and Prevention \(CDC\)](#), as of early December, there were over 33,000 confirmed Zika cases in Puerto Rico. The Puerto Rico Department of Health has [placed](#) the number of confirmed cases at over 35,000, including approximately 2,800 pregnant women, and the number of presumed cases at about 65,000. According to the [CDC](#), there are about 800 locally-transmitted cases in the U.S. Virgin Islands, about 185 locally-transmitted cases in Florida (plus

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<sup>70</sup> See 3(k)(1) of the Small Business Act.

about 785 travel-associated cases), about 55 locally-transmitted cases in American Samoa, and one locally-transmitted case in Texas.

In response to this unprecedented outbreak, the CDC took the equally unprecedented step of issuing Level 2 travel advisories for U.S. citizens traveling domestically to [Puerto Rico](#), the [U.S. Virgin Islands](#), [American Samoa](#), and parts of [Miami-Dade County, Florida](#).<sup>71</sup> These Zika-related travel advisories have had an adverse economic impact, particularly in the travel and tourism sector, although it is difficult at this time to estimate the impact with precision.

- The Task Force recommends that **Congress** amend the definition of “disaster” in the Small Business Act to encompass “communicable diseases for which the federal government issues a travel alert or travel warning” in order to authorize the SBA, at the request of the governor of an affected U.S. state or territory, to issue a disaster declaration and make economic injury disaster loans (EIDLs) available to help small firms in that state or territory recover from any substantial economic injuries they have experienced as a result of health-related travel advisories, such as those issued by the CDC in connection with Zika.<sup>72</sup>

## 6. Supplemental Security Income

The Supplemental Security Income (SSI) program was enacted in 1972 and took effect in 1974.<sup>73</sup> SSI, which is administered by the Social Security Administration (SSA), is a cash assistance program that provides monthly benefits directly to low-income aged, blind, or disabled persons in the 50 states, the District of Columbia, and one U.S. territory—the Northern Mariana Islands.

To receive SSI benefits based on age, an individual must be at least 65 years old. To receive SSI benefits based on disability, an individual must meet the same definition of disability that applies under the Social Security Disability Insurance (SSDI) program. To receive SSI benefits based on blindness, an individual must have visual impairments meeting certain criteria. In addition to age, disability, or blindness, an individual must meet income and resource tests to qualify for SSI benefits.

Congress has not extended the program to four of the five U.S. territories—Puerto Rico, the United States Virgin Islands, Guam, and American Samoa. Instead, Puerto Rico, the U.S. Virgin

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<sup>71</sup> CDC Travel Health Notice types are: Watch Level 1 (practice usual precautions); Alert Level 2 (practice enhanced precautions); and Warning Level 3 (avoid nonessential travel).

<sup>72</sup> See S. 3301, the Small Business Relief from Disease Induced Economic Hardship Act (114<sup>th</sup> Congress; Sen. Rubio).

<sup>73</sup> See Social Security Amendments of 1972 (P.L. 92-603).

Islands, and Guam participate in a federal program called Aid to the Aged, Blind and Disabled (AABD), which used to apply nationwide until it was replaced by the SSI program in the 50 states and the District of Columbia. American Samoa is not currently eligible to participate in either SSI or AABD.

While the SSI program is administered by SSA, the AABD program is administered by the Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services. The AABD program operates as an annual grant, with the federal government providing funding to the local territory government, which in turn distributes it to eligible individuals. In the case of Puerto Rico, ACF provides the annual AABD grant to the Puerto Rico Department of the Family, which then distributes it to eligible individuals. Pursuant to Section 1118 of the Social Security Act, the AABD program includes a 25 percent territory government matching requirement, meaning that for every \$100 in AABD benefits, the government of Puerto Rico must provide \$25. There is a 50 percent territory government matching requirement with respect to administrative, as distinct from assistance, expenditures; for every \$100 the government of Puerto Rico spends to administer the AABD program, it is reimbursed \$50 by the federal government. By contrast, the SSI program has no state government matching requirement and the federal government pays the entire cost of the program, although certain state governments and the District of Columbia government voluntarily choose to provide a supplement to the federal benefit.

Puerto Rico and the other territories that participate in AABD are each subject to an overall annual federal funding cap set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are: (1) the AABD program under Titles I, X, XIV, and XVI of the Social Security Act; (2) the Temporary Assistance for Needy Families (TANF) program under Title IV-A of the Social Security Act; (3) various child welfare funding streams under Title IV-E of the Social Security Act; and (4) the so-called Matching Grant under section 1108(b) of the Social Security Act. Section 1108(b) matching grants, which include a 25 percent territory government matching requirement, may be used for TANF, including child care, and/or Title IV-E programs.

The annual Section 1108 cap for Puerto Rico is \$107,255,000, and has not been increased since enactment of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193). The government of Puerto Rico decides how to use the federal funds among the four programs that are subject to the Section 1108 cap. However, the TANF program—an annual block grant—is capped at \$71,562,501 for Puerto Rico pursuant to Section 403 of the Social Security Act. A territory may request funds less than its TANF cap and substitute claims from the other three programs to fill the deficit. In other words, there are two caps that operate in tandem with respect to the territories: the first is applicable to the cumulative amount of the four programs (the Section 1108 cap) and the second is applicable to the maximum amount of

the TANF grant (the Section 403 cap). The two caps are not adjusted for inflation and have remained at their current levels since Fiscal Year 1997. The effective funding cap after applying the basic TANF block grant is \$35,692,499: \$107,255,000 - \$71,562,501.

Based on a 2014 GAO [report](#), and on information supplied to the Task Force by ACF, the federal government provides approximately \$24 to \$26 million annually to the Puerto Rico Department of the Family under the AABD program, which is used to provide benefits to approximately 34,000 to 38,000 individuals, who receive an average monthly benefit of approximately \$74 to \$77 per recipient, 25 percent of which is government of Puerto Rico funding.<sup>74</sup>

The GAO calculated that, if Puerto Rico were to be included in SSI, Puerto Rico beneficiaries would directly receive between \$1.5 billion and \$1.8 billion per year in federal funding (compared to the current \$24-\$26 million under AABD), 300,000 to 350,000 individuals would receive benefits (compared to the current 34,000-38,000 under AABD), and the average monthly benefit would be around \$540 (compared to \$74-\$77 under AABD). Under SSI, the government of Puerto Rico would have no matching requirement for benefit payments or administrative costs.

Over the years, numerous bills have been introduced in Congress to extend the SSI program to Puerto Rico and the other territories that are excluded from the program.<sup>75</sup>

Some argue against including Puerto Rico and the other territories in the SSI program, at least in part because such inclusion would require substantial new federal outlays through mandatory appropriations from the general fund, yet beneficiaries of the outlays would include residents of the territories who do not pay into the general fund because Congress has exempted residents of Puerto Rico and the other territories from paying federal taxes on income earned within their respective territories. Of course, this argument would apply with equal force in the case of the Northern Mariana Islands, a territory to which Congress has extended the SSI program.

Others argue that it is not appropriate to exclude U.S. citizens living in the territories from the SSI program, especially considering that residents of the territories can simply relocate to the states and obtain full SSI benefits, and that virtually none of the 8.3 million SSI recipients earns sufficient income to owe federal income taxes.

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<sup>74</sup> As a point of comparison, the average monthly AABD benefit in Guam is \$150, the average monthly AABD benefit in the U.S. Virgin Islands is \$176, the average monthly SSI benefit in the Northern Mariana Islands is \$591, and the average monthly SSI benefit nationwide is \$540.

<sup>75</sup> See, e.g., H.R. 1822, the Supplemental Security Income Equality Act (114<sup>th</sup> Congress; Rep. Pierluisi).

Some argue that SSI subjects beneficiaries to earnings and asset tests, which provide disincentives to saving and work activities. Disincentives to work would impose further labor-market challenges in Puerto Rico, given the already poor labor force participation rate.

The Task Force makes the following recommendation:

- The Task Force believes that it is important for Congress to debate the adequacy of the AABD program in Puerto Rico. The Task Force reviewed the historical record and was unable to identify a hearing conducted in the House or the Senate on this issue. The Task Force recommends that **Congress** examine the costs and benefits of either: (1) including Puerto Rico and the other territories in the SSI program with full benefits; (2) including Puerto Rico and the other territories in the SSI program with reduced benefits; (3) increasing the annual AABD grant provided to Puerto Rico and the other territories; (4) indexing the AABD and TANF caps to inflation; or (5) maintaining current law. In any examination, incentives to work should be considered.

The Task Force found it challenging to obtain up-to-date, publicly-available information about the operation of the AABD program in Puerto Rico, including basic information about the number of AABD beneficiaries, eligibility requirements for receiving AABD benefits, the average monthly AABD benefit, and the differences between the AABD program and the SSI program. As a result, the Task Force asked CRS to prepare a memorandum on this subject, and the Task Force has made that memorandum available to the public.<sup>76</sup>

The Task Force makes the following recommendation:

- The Task Force recommends that the **Administration for Children and Families**, working in conjunction with the Puerto Rico Department of Family, make publicly available—ideally on its website—a document that provides an up-to-date, detailed description of the AABD program in Puerto Rico and the other territories, in order to help federal policymakers better assess the AABD program.

## 7. U.S. Department of Commerce

The Secretary of the U.S. Department of Commerce made a written submission to the Task Force. On October 28<sup>th</sup>, the Task Force held a staff-level briefing with officials from the Office

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<sup>76</sup> See William R. Morton, [Cash Assistance for the Aged, Blind, and Disabled in Puerto Rico](#), Congressional Research Service, October 26, 2016; see also Robin Respaut, [Deserted Island: The Disabled in Puerto Rico Fend for Themselves After Decades of U.S. Neglect](#), Reuters, December 9, 2016.

of the Secretary, the Bureau of Economic Analysis, the International Trade Administration, the Economic Development Administration, and the Minority Business Development Agency.

### A. Bureau of Economic Analysis

The Bureau of Economic Analysis (BEA) prepares and publishes a wide variety of economic statistics. BEA [produces](#) a quarterly estimate of U.S. gross domestic product (GDP), which covers only the 50 states and the District of Columbia, not the five U.S. territories. In addition, BEA produces quarterly GDP estimates for [each of the 50 states and the District of Columbia](#). Moreover, since 2010, the BEA has been [producing](#) annual GDP estimates for each U.S. territory other than Puerto Rico, reaching back in time to cover 2002 to 2014. In recent years, these territory estimates have been expanded to cover GDP by industry and compensation by industry. The GDP estimates for the four territories are calculated by BEA pursuant to a Statistical Improvement Program funded by the Office of Insular Affairs (OIA) in the U.S. Department of the Interior, which has jurisdiction over the territories other than Puerto Rico.

In late 2010 and early 2011, pursuant to an August 2010 request made by the Secretary of the Puerto Rico Department of Economic Development and Commerce to the U.S. Secretary of Commerce and a recommendation contained in the March 2011 report by the President’s Task Force on Puerto Rico, the BEA began an effort to help the government of Puerto Rico modernize its economic statistics programs. In the autumn of 2011, BEA produced a [report](#) describing its efforts and making recommendations, including the recommendation that Puerto Rico change its featured measure of production from GNP to GDP.<sup>77</sup> As a consequence of the change of administration in Puerto Rico in 2013, BEA stopped receiving cooperation from local officials and was unable to continue its provision of technical assistance for a period of years, and did not resume its work until 2015. In total, BEA estimates that it has spent \$350,000 in direct support to Puerto Rico, which it funded out of its core budget.

The Task Force makes the following recommendations:

- The Bureau of Economic Analysis currently publishes GDP estimates for each state, the District of Columbia, and every territory other than Puerto Rico. The Task Force supports BEA’s efforts to help the government of Puerto Rico modernize its economic statistics

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<sup>77</sup> As [described](#) by BEA: “GDP is the market value of goods and services produced by labor and property within a country’s (or territory’s) borders, regardless of nationality. GNP is the market value of goods and services produced by labor and property supplied by resident producer units, regardless of where they are located. For GNP, as long as the labor and property are supplied by Puerto Rican residents, they may be located either in Puerto Rico or abroad. GDP refers to production taking place in Puerto Rico. It is, therefore, the appropriate measure for much of the short-term monitoring and analysis of the Puerto Rican economy. In particular, GDP is consistent in coverage with indicators such as employment, industry output, and investment in equipment and structures.”

programs, including the methods used to measure the island's GDP (and GNP). However, the Task Force recommends that **BEA** should calculate GDP for Puerto Rico, just as BEA does for every other U.S. jurisdiction. The Task Force recognizes that a transition period will likely be required, during which BEA and the government of Puerto Rico may need to share data collection and calculation responsibilities pursuant to a hybrid model. The Task Force further recommends that, in the same way that the U.S. Department of Interior is funding BEA's efforts to estimate GDP for each of the smaller territories, the federal government should fund BEA's efforts to calculate GDP for Puerto Rico. Finally, the Task Force believes that BEA's longer-term objective should be to include the U.S. territories (collectively, home to about 3.8 million people), alongside the states and the District of Columbia, in BEA's *national-level* GDP estimates, which will require the territory-level GDP data to meet all of BEA's quality standards.

## **B. International Trade Administration**

The International Trade Administration (ITA) seeks to boost foreign direct investment in the United States (including its territories) through the [SelectUSA](#) program and other programs; to help U.S. companies (including companies in the territories) increase their exports to foreign markets through the [National Export Initiative](#) and other programs; and to promote travel by foreign nationals to the United States (including its territories). ITA's National Travel and Tourism Office (NTTO) supports the U.S. travel and tourism industry. It is the principal liaison in the federal government to [Brand USA](#), the non-profit, public-private partnership that serves as the destination marketing organization for the United States, including all territories. Brand USA aims to attract international visitors, which constitute the largest services export for the United States, through advertising campaigns; providing information on required documents, fees, and procedures; correcting misperceptions about U.S. entry policies; and assisting both rural and urban areas in bringing international tourists.

ITA does *not* promote domestic investment (including investment by stateside companies in Puerto Rico), interstate commerce (including commerce between the states and Puerto Rico) or interstate travel (including travel between the states and Puerto Rico).

With respect to foreign direct investment, notwithstanding Lufthansa Technik's 2014 [decision](#) to open a maintenance, repair and overhaul (MRO) facility in Puerto Rico, an achievement for which ITA deserves significant credit, foreign direct investment (FDI) in Puerto Rico appears to be minimal in recent years, based on state-by-state data from 2014 and 2015 in BEA's [Survey of New Foreign Direct Investment in the United States](#).<sup>78</sup> It is difficult to measure FDI in Puerto Rico, since the government of Puerto Rico has not published relevant data since Fiscal Year

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<sup>78</sup> See [BEA's New Foreign Direct Investment in the United States, 2014 and 2015](#).

1984.<sup>79</sup> The Task Force is advised that BEA is working to help the government of Puerto Rico resume collection of these data after a 30-year hiatus.

With respect to exports, the situation appears challenging as well. According to the U.S. Census Bureau's foreign trade statistics, [exports from Puerto Rico](#) to foreign nations totaled \$20.4 billion in Calendar Year 2015, while the Puerto Rico Institute of Statistics places the estimate somewhat lower at \$17.5 billion. Either way, this is a significant sum, but it is clear that the vast majority (over 90 percent) of these exports are from foreign subsidiaries of U.S. companies operating in the pharmaceutical product, organic chemical, and medical equipment and supply industries. Apart from these large multinational firms, Puerto Rico-based companies appear to export relatively little to foreign countries. Small firms seem to fare particularly poorly. In the November 2016 [Puerto Rico Small Business Survey](#), released by the New York Federal Reserve Bank, 81 percent of firms surveyed say they derive no revenue from exports, 14 percent of firms derive less than 25 percent of their revenue from exports, 3 percent of firms derive 25 to 50 percent of their revenue from exports, 0 percent of firms derive 51 to 75 percent of their revenue from exports, and 2 percent of firms derive more than 75 percent of their revenues from exports. Moreover, based on the ambiguous phrasing of the question posed, it is possible—perhaps probable—that surveyed firms included sales to customers in the U.S. mainland within the definition of “exports.” If so, the actual export figures may be even worse than the survey suggests.

With respect to travel and tourism, they are an important component of Puerto Rico's economy, currently constituting about [7 percent](#) of GNP. However there is clearly room for significant improvement, particularly as it relates to visitors from foreign nations. According to the [government of Puerto Rico](#), the number of annual visitors to Puerto Rico over the last decade (2006 to 2015) has averaged about 4.6 million. In 2015, there were about 5.0 million visitors who spent a total of \$3.8 billion. Of those 5.0 million visitors, 3.5 million (70 percent) were “tourists” and 1.5 million (30 percent) were “excursionists” who arrived to the island on cruise ships. Of the 3.5 million tourists, 3.1 million (88 percent) came from the mainland U.S. and only 473,000 (12 percent) came from foreign countries.<sup>80</sup>

Based on the observations above, Puerto Rico is in significant need of the various services that ITA provides related to FDI, exports, and travel and tourism.

On the one hand, Puerto Rico should be an attractive location for capital investors (as well as for tourists). The island has natural beauty, a superb climate, a rich culture, and a fascinating history. Puerto Rico is part of the U.S. banking, currency, trade, and legal systems. Puerto Rico

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<sup>79</sup> See [Puerto Rico Planning Board, Balance of Payments 2015](#), at page 19, note a.

<sup>80</sup> See [Statistical Appendix](#), page A-38.

has access to U.S. markets, including—until recently—financial markets. It has free flows of labor and capital and participates in the U.S. trade regime with the rest of the world. It is strategically located in the Caribbean region, approximately 1,000 miles from both the southern United States and the Andean region of South America. Although Puerto Rico’s elementary and secondary public school system requires reform, and migration to the states has taken a considerable toll on the available labor pool, both skilled and unskilled, there is still a large pool of well-educated professionals on the island. According to the Census Bureau, of Puerto Rico’s population age 25 and older, 30.5 percent have a college or graduate degree, virtually the same percentage as in the states. Ninety-five percent of Puerto Rico residents speak Spanish at home and, while 77 percent profess to speak English “less than very well,” there are many fully bilingual or proficient English speakers, particularly among the island’s youth.

On the other hand, there are number of factors in Puerto Rico that tend to inhibit capital investment, including the government’s fiscal challenges; poor financial reporting; the high cost of electricity and other utilities; a burdensome permitting system and other bureaucratic issues; a relatively high level of violent crime; labor market rigidities; complicated and often idiosyncratic tax policies; relatively weak infrastructure; and a high degree of politicization, which causes even productive investments, policies, and programs to be halted by one political party because they were instituted under the other political party.

The Task Force makes the following recommendations:

- The Task Force was advised by multiple federal agencies that the government of Puerto Rico has yet to establish a comprehensive economic development strategy that exploits the island’s many comparative advantages, both intrinsic and acquired, and that endures after power passes from one local party to the other. The Task Force recommends that the **government of Puerto Rico** take this constructive criticism to heart.
- The Task Force recommends that the **International Trade Administration** take all reasonable steps to educate stakeholders in Puerto Rico about the multiple services that ITA provides, including by holding educational or technical assistance events in Puerto Rico. The Task Force is especially concerned about the relatively low level of export activity on the part of Puerto Rico firms, particularly small firms, and believes there is room for significant improvement in this area, if properly facilitated by ITA.
- The Task Force was advised by federal agencies that the government of Puerto Rico has a history of opening and operating trade offices in other nations to promote foreign direct investment, trade, and other commercial arrangements. The federal agencies observed that, while there is absolutely nothing inherently wrong with this practice, the government of Puerto Rico may not fully appreciate that it can obtain these services from the International

Trade Administration at little to no cost and with (presumably) equal or better results. The Task Force recommends that the **government of Puerto Rico** take additional steps to leverage the available resources and programs of ITA and carefully consider whether the economic benefits of operating trade offices in other nations outweigh the financial costs, particularly if the sought-for benefits can be realized by tapping into existing ITA resources and expertise.

- Adhering to the principle that it is difficult to improve what you cannot measure, the Task Force recommends that the **government of Puerto Rico** collect and publish annual statistics about foreign direct investment on the island, making sure to disaggregate the data so that investment from the U.S. mainland and investment from foreign nations are tabulated separately. The Task Force further recommends that any federal government statistical products that provide state-by-state data on foreign direct investment also include equivalent data on Puerto Rico and the other territories.
- The [United States Travel and Tourism Advisory Board](#) (TTAB) serves as the advisory body to the Secretary of Commerce on matters relating to the travel and tourism industry in the United States. The Board consists of up to 32 members appointed by the Secretary of Commerce, who typically serve for a two-year term. Members represent companies and organizations in the travel and tourism industry from a broad range of products and services, company sizes and geographic locations. The [current board](#) includes individuals from many states, including the president of the American Indian Alaska Native Tourism Association. The Task Force recommends that the **Secretary of Commerce** take reasonable steps to appoint at least one member who has special expertise on tourism in Puerto Rico and/or the other territories.
- The Task Force believes that more can be done to increase the relatively low level of travel and tourism in Puerto Rico by foreign nationals. The Task Force notes that the ITA's National Travel and Tourism Office (NTTO) conducts a [Survey of International Air Travelers](#) (SIAT). The SIAT provides key market intelligence on the characteristics of visitors to a U.S. jurisdiction. This information can then be used by the jurisdiction's tourism promotion body to develop targeted marketing strategies to attract visitors and help ensure they obtain the experience they desire. The Task Force has been advised that, despite efforts by NTTO, the SIAT is not conducted at the San Juan International Airport, evidently because of opposition from the airport's private operator. The Task Force believes the SIAT could provide valuable information to help Puerto Rico increase tourism from foreign nationals, and recommends that the **airport's private operator**, the **Puerto Rico Ports Authority**, and the **Puerto Rico Tourism Company** work with NTTO with the goal of authorizing the SIAT to be conducted at the San Juan International Airport on mutually-acceptable terms. The distribution and collection of surveys would be completed by the Puerto Rico Tourism Company (a public corporation), the airport staff, or a private sector company from Puerto

Rico. The NTTO would supply the questionnaire (available in 12 languages) and pay for the entry, verification, processing, and publication of the data. The NTTO would provide the survey results to a lead contact in Puerto Rico, and prepare an annual “Overseas Visitors to Puerto Rico” report for use by the Puerto Rico Tourism Company and others.

### C. Economic Development Administration

The U.S. Economic Development Administration (EDA) [describes](#) itself as “the only federal government agency focused exclusively on economic development.” Through multiple competitive grant programs, the agency provides assistance to economically-distressed regions and areas.<sup>81</sup> In Fiscal Year 2016, the EDA received \$222 million for its programs and activities.

Between Fiscal Year 2010 and Fiscal Year 2015, EDA made over 4,100 grants totaling more than \$1.7 billion to applicants throughout the United States. In that time period, Puerto Rico applicants received 10 grants totaling \$6.2 million, among the lowest of all jurisdictions.<sup>82</sup>

In Fiscal Year 2010, EDA made a \$400,000 grant to the Puerto Rico Planning Board, which was used to develop a [Comprehensive Economic Development Strategy](#) (CEDS) for Puerto Rico. The CEDS was prepared by the CEDS Committee, which consists of representatives of the government of Puerto Rico, universities, non-profit organizations, and trade organizations. The EDA approved the 2010 CEDS, and approved updates to the CEDS made by the CEDS Committee in 2012 and 2014.<sup>83</sup> The CEDS Committee is currently in the process of preparing a new CEDS, which is expected to be released in early 2017, but could be delayed somewhat as a result of the forthcoming change in local administration. Unlike the 2010 CEDS, EDA is not funding this effort through a grant, but is providing technical assistance to ensure that the new CEDS complies with all EDA guidelines.

EDA has six regional offices. Puerto Rico is one of 16 jurisdictions covered by the Philadelphia Regional Office. The EDA’s Economic Development Representative for Puerto Rico is currently based in Philadelphia, not Puerto Rico. An Economic Development Representative provides a variety of services, including offering technical assistance to potential applicants for EDA funding, monitoring the implementation of EDA-funded projects by grantees, and interacting with the CEDS Committee.

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<sup>81</sup> EDA’s main grant programs include: Public Works (funded at \$100 million in Fiscal Year 2016); Economic Adjustment Assistance (\$35 million); Partnership Planning Assistance (\$32 million); Regional Innovation Strategies (\$15 million); Trade Adjustment Assistance (\$13 million); and Technical Assistance (\$10.5 million).

<sup>82</sup> See EDA, Annual Reports to Congress for Fiscal Year 2010 to Fiscal Year 2015, available [here](#).

<sup>83</sup> EDA provided the Task Force with a copy of the 2010 and 2014 CEDS.

The Task Force makes the following recommendations:

- The Task Force is aware that EDA recently determined that its Economic Development Representative (EDR) for Puerto Rico can more effectively serve the island if the Representative is based in Puerto Rico, rather than in the Philadelphia Regional Office. The Task Force recommends to **EDA** that a Puerto Rico-based EDR begin work as soon as possible. The Task Force urges the Puerto Rico-based EDR to provide technical assistance to potential grantees and to identify projects on the island that may be suitable for EDA support. Similarly, the Task Force recommends to potential Puerto Rico-based applicants for EDA funding that they affirmatively seek technical assistance from EDA and incorporate feedback from EDA into their applications, a step that EDA says does not always occur. The Task Force believes that the ultimate objective should be to arrive at a point where the quantity of EDA grants to Puerto Rico-based applicants better corresponds with the size of Puerto Rico's population and the scale of its economic development needs.
- The Task Force was advised by multiple federal agencies that the government of Puerto Rico has yet to establish a comprehensive economic development strategy that exploits the island's many advantages. The 2017 Comprehensive Economic Development Strategy (CEDS) for Puerto Rico that the CEDS Committee is in the process of preparing, with technical assistance from EDA, could help in this regard. The Task Force recommends that the **CEDS Committee** obtain input from a diverse array of stakeholders, particularly from the private and non-profit sectors. The Task Force further recommends that that CEDS Committee, once the CEDS has been approved by EDA, make the CEDS available on-line and otherwise publicize the CEDS to stakeholders on the island, in the U.S. mainland, and abroad. The Task Force notes that, although the Puerto Rico Planning Board purports to provide a link to the current CEDS (last updated in 2014) on its website, the Task Force was unable to access the report. An economic development strategy document not accessible by the general public, potential and current investors in the island, and other stakeholders is of questionable utility, no matter how sound its contents might be.
- The Puerto Rico Department of Agriculture has advised the Task Force that over 80 percent of the food consumed in Puerto Rico is transported to the island from the U.S. mainland and from foreign countries. According to information provided to the Task Force, an extended disruption in maritime trade could result in Puerto Rico's supply of food being exhausted within a matter of weeks or less. The Task Force notes that, in Fiscal Year 2011, EDA made a \$100,000 Economic Adjustment Assistance grant to the Hawaii State Office of Planning to develop a plan to improve Hawaii's agricultural sector and food distribution systems, with Hawaii contributing \$100,000 in matching funds. In 2012, the Hawaii government released a three-volume report, with [Volume 1](#) entitled "Increased Food Security and Food Self-

Sufficiency Strategy.” The Task Force believes that a similar EDA-funded effort may be appropriate and valuable in the case of Puerto Rico and recommends to **EDA**, the **CEDS Committee**, and other stakeholders that they explore this possibility.

#### **D. Electronic Export Information**

Under 13 U.S.C. Chapter 9 (Section 301 to Section 307), the U.S. Census Bureau—within the U.S. Department of Commerce—is responsible for collecting and publishing export trade statistics. The Census Bureau has issued [regulations](#)—15 CFR 30—to fulfill this responsibility. Except in specified instances, these regulations require an exporter to provide Electronic Export Information (EEI), which includes the identity of the exporter and detailed information regarding the exported product. While the Census Bureau uses the EEI solely for statistical purposes, other federal agencies use EEI to prevent unauthorized exports. EEIs are generally filed electronically through the [Automated Export System \(AES\)](#). EEIs are completed and filed by either the exporter (known as the U.S. Principal Party in Interest, or USPPi) or by the maritime or air carrier (the freight forwarder) transporting the goods.

EEI filings are required for shipments between the United States (including its territories) and a foreign nation, although EEI filings are not generally required for shipments from the United States to Canada.<sup>84</sup> EEI filings are not required for shipments between one U.S. state and another U.S. state.

With respect to shipments between the 50 states and a U.S. territory, the situation is more complex. For example:

- EEI filings *are* required for shipments from the states to Puerto Rico, and *are* required for shipments from Puerto Rico to the states.<sup>85</sup>
- EEI filings *are* required for shipments from the states (or from Puerto Rico) to the U.S. Virgin Islands, but *are not* required for shipments from the U.S. Virgin Islands to the states (or to Puerto Rico).<sup>86</sup>
- EEI filings *are not* required for shipments between the states and American Samoa, Guam, or the Northern Mariana Islands.<sup>87</sup>

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<sup>84</sup> See 15 CFR 30.36.

<sup>85</sup> See 15 CFR 30.2(a)(1)(i)(A) and (B).

<sup>86</sup> See 15 CFR 30.2(a)(1)(i)(C).

<sup>87</sup> See 15 CFR 30.2(d)(2).

The U.S. territories are not foreign countries, and Puerto Rico—unique among the five territories—is within “the customs territory of the United States.”<sup>88</sup> Trade between the states and Puerto Rico is therefore more accurately described as interstate commerce than international commerce.

The Task Force received a written submission from the Express Association of America, which consists of the four largest express delivery service providers in the world—Deutsche Post DHL Group, FedEx, TNT and United Parcel Service (UPS). The Express Association asserted the following:

Requiring EEI filings is tantamount to placing a boundary that separates Puerto Rico from the United States to the detriment of the Island’s economic well-being. The EEI filing requirement adds a cost which increases the price of many goods purchased in Puerto Rico and imposes an unnecessary burden on interstate commerce, restricting the flow of trade within the United States. As a result, some stateside companies simply decide not to ship their merchandise to Puerto Rico. The EEI requirement is equally burdensome on companies exporting from Puerto Rico, particularly for small and medium sized business which do not have large brokerage and customs compliance staffs to generate the data. [Bullet points in original removed].

The Task Force makes the following recommendation:

- The Task Force recommends that the **U.S. Department of Commerce**—in consultation with its internal departments and other stakeholders, such as the U.S. Census Bureau and the Bureau of Economic Analysis; other appropriate federal agencies; the Puerto Rico Institute of Statistics; the Puerto Rico Planning Board; and the trade community—conduct a thorough evaluation of its regulations requiring EEI filings for shipments between the states and Puerto Rico. The Task Force is concerned about the possible adverse impact that required EEI filings may have on commerce between the states and Puerto Rico. At the same time, as described elsewhere in this report, the Task Force is intent on ensuring that timely and reliable economic statistics are available for Puerto Rico. The Task Force has been advised by federal officials that elimination of the EEI requirement may (1) negatively impact the ongoing, joint federal-local effort to modernize the methodology used to calculate Puerto Rico’s gross domestic product (GDP) and other macroeconomic statistics, and (2) make it more difficult to measure trade between the states and Puerto Rico. As part of the recommended evaluation, the Department of Commerce should identify and weigh the

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<sup>88</sup> See 19 CFR 101.1.

benefits and costs of required EEI filings. The Department should assess whether alternate datasets, such as the government of Puerto Rico's [SURI](#) system (Sistema Unificado de Rentas Internas), could be used with or without modification to achieve the same statistical objective, while imposing a lesser burden on commerce. The recommended examination should also attempt to quantify any economic benefits that would be achieved by eliminating the EEI filing requirement.

## **8. U.S. Department of the Treasury**

### **A. CDFI Fund**

The Community Development Financial Institutions Fund (CDFI Fund), an office within the Department of the Treasury, seeks to generate economic growth in low-income communities that lack access to capital, credit and financial services. On October 4<sup>th</sup>, the Task Force held a staff-level briefing with the director of the CDFI Fund to discuss the Fund's programs and whether they are having their intended effects in Puerto Rico.

The CDFI Fund administers a number of competitive programs that invest in, train, and otherwise support CDFIs, including the core CDFI program, the Bank Enterprise Award program, and the Capital Magnet Fund. CDFIs are banks, credit unions, loan funds, or venture capital providers that provide loans, investments, financial services, and technical assistance to individuals and businesses with the goal of promoting community development in underserved areas.<sup>89</sup>

Under the core CDFI program, the CDFI Fund provides two types of monetary awards through an annual competitive application process: financial assistance awards up to \$2 million and technical assistance awards up to \$125,000.<sup>90</sup> Under the Bank Enterprise Award (BEA) program, the CDFI Fund makes awards to FDIC-insured banks and thrifts on a competitive basis. BEA program awardees are recognized for increasing their investments in certified CDFIs and their activities in economically-distressed communities. BEA program awards are retrospective, rewarding applicants for activities they have already completed.<sup>91</sup> Under the Capital Magnet

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<sup>89</sup> There are nearly 1,000 certified CDFIs operating nationwide, but only six based in Puerto Rico, all loan funds.

<sup>90</sup> Since the inception of the CDFI program in 1994, the CDFI Fund has made about 3,000 FA and TA awards to CDFIs, totaling about \$2 billion. The CDFI Fund has made a total of five FA awards and three TA awards to Puerto Rico-based CDFIs, totaling \$2.3 million, and has made no awards since 2009. At least 9 CDFIs based in the states have made investments in Puerto Rico as well.

<sup>91</sup> Since the inception of the BEA program in 1994, no FDIC-insured bank in Puerto Rico has applied for a BEA.

Fund, the CDFI Fund makes competitive grants to CDFIs and non-profit housing organizations to finance affordable housing and other community revitalization projects.<sup>92</sup>

In addition, the CDFI Fund administers the New Markets Tax Credit (NMTC) program, which utilizes Community Development Entities (CDEs). CDEs are financial intermediaries through which private capital flows from investors to a qualified business located in a low-income community. Specifically, CDEs use their authority to offer federal income tax credits to investors in exchange for the investors making equity investments in the CDE. The federal tax credit totals 39 percent of the original investment amount and is claimed over a period of seven years. Using the capital from these equity investments, CDEs can lend to and invest in businesses operating in low-income communities.<sup>93</sup>

While members of the Task Force agree on the ultimate goals of CDFI programs, members have varying views about the efficacy of the programs in achieving those objectives. In addition, some members of the Task Force have concerns about the adequacy of controls in CDFI programs.<sup>94</sup> Nevertheless, members of the Task Force agree that Puerto Rico should receive equitable opportunities under all CDFI Fund programs authorized and funded under current law.

The Task Force makes the following recommendations:

- The CDFI Fund website contains a “[Searchable Awards Database](#).” The database includes a user-friendly map. By clicking on any state or the District of Columbia, a visitor to the website receives a detailed summary of all CDFI Fund awards made to CDFIs and CDEs in that jurisdiction. Puerto Rico and the other territories are not included on the map, even though territory-based CDFIs and CDEs are eligible for all CDFI Fund programs. Similarly, the CDFI website contains a “[NMTC Allocatee States Served](#)” page, which features a map that also excludes Puerto Rico and the other territories. The Task Force recommends that the **CDFI Fund** update the maps on its website to include Puerto Rico and the other territories, and provide the same level of detailed award information for the territories that it provides for the states and the District of Columbia.

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<sup>92</sup> No Puerto Rico-based CDFI or non-profit housing organization has received a Capital Magnet Fund award.

<sup>93</sup> Nationwide, there are approximately 6,000 certified CDEs, including 18 based in Puerto Rico. Beginning in 2002, the CDFI Fund has completed 13 NMTC allocation rounds. The Fund has made 1,032 allocation awards totaling \$50.5 billion in tax credit allocation authority. Puerto Rico-based CDEs have received three allocations, one for \$45 million in 2009, one for \$10 million in 2009, and one for \$70 million in 2016.

<sup>94</sup> See, e.g., [New Markets Tax Credit: Better Controls and Data Are Needed to Ensure Effectiveness](#), Government Accountability Office, July 10, 2014 (GAO-14-500).

- Although there are CDFIs based in the states that have made important investments in Puerto Rico, that does not diminish the need for additional Puerto Rico-based CDFIs that are familiar with Puerto Rico’s particular economic and social needs and are focused exclusively on community development on the island. Puerto Rico has among the fewest CDFIs per capita of any state, and *the* fewest CDFIs per capita when the population is limited to individuals living below the federal poverty level. The Task Force recommends that the **CDFI Fund** take all reasonable steps to increase the number of CDFIs in Puerto Rico and the other territories, consistent with the House Appropriations Committee’s language to that effect in the [report](#) accompanying the Financial Services and General Government Appropriations Act, 2017.<sup>95</sup> The Task Force further recommends that the CDFI Fund, as part of its Capacity Building Initiative, conduct at least one outreach event in Puerto Rico in the near future, something the Fund has not done to date. In addition, the Task Force recommends that the CDFI Fund continue its ongoing work with the U.S. Department of Commerce’s Minority Business Development Agency, the Federal Reserve Bank of New York, the Opportunity Finance Network (a member-based organization of CDFIs), and other stakeholders to expand the number of CDFIs in Puerto Rico and to improve their capacity to apply for, obtain and make optimal use of CDFI Fund awards. Finally, the Task Force notes that there are 11 credit unions in Puerto Rico that are insured by the National Credit Union Administration (NCUA) and that, in January 2016, the CDFI Fund and the NCUA signed a [memorandum of understanding](#) to streamline the process for low-income credit unions to be certified as CDFIs. The Task Force recommends that the CDFI Fund take steps to educate the 11 NCUA-insured credit unions in Puerto Rico about the potential benefits of becoming a certified CDFI and about the process that exists for low-income credit unions to become certified on an expedited basis.
- Puerto Rico has fared poorly under the NMTC program to date, particularly in light of the fact that it has a higher poverty rate and unemployment rate than any state, making it precisely the kind of economically-distressed jurisdiction that the NMTC program is designed to assist. The Task Force recognizes that this problem cannot be resolved from one day to the next, but rather requires determined efforts on the part of the CDFI Fund, current and potential Puerto Rico-based CDEs, and other stakeholders. The CDFI Fund indicated in a memorandum to the Task Force that the preference that the Fund provides to applicants who commit to making “innovative use” of its NMTC allocation “serves as an incentive” for applicants to invest in states and territories, like Puerto Rico, that have historically received lower levels of NMTC-supported investments. At this juncture, however, there is insufficient evidence to confirm that the “innovative use” preference is, in fact, having such an incentivizing effect. Therefore, the Task Force recommends that the **CDFI Fund** include in its annual NMTC program award report any examples of allocation awards that were

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<sup>95</sup> See page 19.

advanced through the NMTC review process as a result of the “innovative use” criteria. By highlighting these success stories, the CDFI Fund could encourage future applicants to pursue development strategies in geographic areas that have been historically underserved by NMTC-supported investments as a means of being selected from a highly-competitive pool of applicants.

- The Task Force recommends that the **CDFI Fund** take steps to educate FDIC-insured banks in Puerto Rico about the potential benefits of applying for retrospective awards under the Bank Enterprise Award program, and reinvesting any award funding it receives into distressed communities on the island. The Task Force further recommends that the CDFI Fund take steps to educate Puerto Rico-based CDFIs about the Capital Magnet Fund.
- The director of the CDFI Fund is advised by a 15-member [Community Development Advisory Board](#).<sup>96</sup> Six Board members represent federal agencies, while nine are private citizens appointed by the President. Federal law requires that these nine individuals “be selected, to the maximum extent practicable, to provide for national geographic representation and racial, ethnic, and gender diversity.” No resident of Puerto Rico or any other territory has ever served on the Advisory Board. The Task Force believes that the lending and community development issues in the territories are unique in certain respects, and that CDFI Fund leadership could benefit from the counsel of an Advisory Board member with specialized expertise in this area. The Task Force recommends that the **CDFI Fund** make good-faith efforts to appoint an individual to the Community Development Advisory Board with personal experience and specialized expertise in the unique lending and community development issues facing U.S. territories.

## **B. Technical Assistance to the Government of Puerto Rico**

Beginning in Fiscal Year 2016, Congress has expressly authorized the U.S. Department of the Treasury to provide “technical assistance” to the government of Puerto Rico on “stabilizing and strengthening public financial management and financial management systems.”<sup>97</sup>

On October 11<sup>th</sup>, the Treasury Department provided a staff-level briefing for some, but not all, members of the Task Force. The Treasury Department indicated that it is currently using its technical assistance authority to help the government of Puerto Rico in the following five areas: (1) tax collection enforcement, (2) revenue forecasting and receipts estimation, (3) large taxpayer

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<sup>96</sup> See 12 U.S.C. 4703.

<sup>97</sup> See Division E, Financial Services and General Government Appropriations Act, 2016, part of the [Consolidated Appropriations Act, 2016](#) (P.L. 114-113); see also [House Report 114-94](#), accompanying the Financial Services and General Government Appropriations Act, 2016, at page 11.

unit and general audit of taxpayers, (4) budget and cash management, and (5) information technology (tax administration).<sup>98</sup>

The Task Force makes the following recommendation:

- The Task Force recommends that **Congress** continue to provide the U.S. Department of the Treasury with the authority to provide technical assistance to the government of Puerto Rico, in order to help it stabilize and strengthen its financial management, financial management systems, and tax collection systems, with robust periodic reporting requirements. The Task Force recommends that the **Treasury Department** continue to provide technical assistance pursuant to this authority, and that the Treasury Department report to Congress on a regular basis regarding these efforts and the progress that is being made.

## 9. Investor Protection

On May 25, 2016, H.R. 5322, the [U.S. Territories Investor Protection Act of 2016](#), was introduced in the House of Representatives.<sup>99</sup> The bill amends Section 6(a)(1) of the Investment Company Act of 1940 to terminate an exemption for investment companies located in Puerto Rico or any other U.S. territory. Under current law, such companies are exempt from registration under the Act provided that their shares are sold solely to the residents of the territory in which they are located. The bill provides a three-year safe harbor for investment companies that currently enjoy this exemption. Additionally, the bill authorizes the Securities and Exchange Commission (SEC) to further delay the effective date (that is, the end of the exemption) for a maximum of three years following the initial three year safe harbor.

H.R. 5322 was unanimously approved by the House Committee on Financial Services on June 16, 2016.<sup>100</sup> On July 11<sup>th</sup>, the full House approved H.R. 5322 by voice vote. On September 9<sup>th</sup>, an identical companion bill to H.R. 5322, S. 3467, was introduced in the Senate.<sup>101</sup>

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<sup>98</sup> The Chairman of the Task Force, who is also the Chairman of the Senate Finance Committee, which has oversight and authorization responsibilities with respect to the Treasury Department, expresses his view that Treasury officials have chosen not to provide briefings requested by the Chairman regarding use of this technical assistance authority, or to explain why the Treasury Department has signed confidentiality agreements with two component units of the government of Puerto Rico, or to substantively respond to questions put forward by the Chairman. The Chairman expresses his view that this lack of transparency and accountability does not serve Congress or the people of Puerto Rico.

<sup>99</sup> H.R. 5322 was introduced by Rep. Nydia Velázquez of New York.

<sup>100</sup> See [House Report 114-673](#).

<sup>101</sup> S. 3467 was introduced by Senator Robert Menendez of New Jersey and cosponsored by Senator Orrin Hatch of Utah.

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** pass the U.S. Territories Investor Protection Act of 2016. The Task Force believes that the original justification for the exemption of investment companies located in Puerto Rico and the other territories from the Investment Company Act of 1940 (namely, the logistical challenges associated with SEC personnel traveling to the territories in order to inspect investment companies) is no longer valid; that repealing this exemption will provide important protections for investors residing in the U.S. territories that they currently lack; and that the U.S. Territories Investor Protection Act of 2016 provides investment companies in the territories with sufficient opportunity to come into compliance, and therefore does not unduly burden those companies.
- Municipal securities are subject to rules set by the Municipal Securities Rulemaking Board (MSRB), a self-regulatory organization charged with regulating financial companies that sell, purchase and underwrite municipal securities. SEC Rule 15c2-12 requires that dealers, when underwriting certain municipal securities, ensure that the state or local government issuing the bonds agrees to disclose certain information to the MSRB on an ongoing basis. Timely disclosure helps investors make informed decisions about investments in municipal bonds, including instances in which material changes to an issuer's financial condition occur, and helps protect them against fraud involving the bonds. The Task Force observes that Puerto Rico has too often missed its continuing disclosure obligations to provide audited financial statements. Failure to meet such obligations may have contributed to an inability of all stakeholders to fully understand the nature and extent of Puerto Rico's economic and fiscal challenges in a timely manner. The Task Force encourages further debate in Congress about the efficacy of SEC and MSRB rules and regulations governing failures to meet disclosure requirements.

## 10. Public Safety

Violent crime in a jurisdiction harms quality of life, spurs migration, and hinders economic growth by creating an overall environment that is less conducive to business activity and investment.

According to the [FBI's Uniform Crime Reporting](#) program for 2015, Puerto Rico has a higher homicide rate—16.8 homicides per 100,000 inhabitants—than any U.S. state. The state with the highest homicide rate is Louisiana, at 10.3 homicides per 100,000 inhabitants. The number of homicides in Puerto Rico peaked in 2011, at 1,164—or 31.4 homicides per 100,000 residents. There was a steady downward trend in the following years, with 1,005 homicides in

2012, 902 homicides in 2013, 684 homicides in 2014, and 588 homicides in 2015.<sup>102</sup> However, the number of homicides in [2016](#) exceeds the number in 2015, with over 630 homicides having occurred as of mid-December.

Many, if not most, of the homicides and other violent crimes in Puerto Rico are connected to the international narcotics trade.<sup>103</sup> Puerto Rico is an important transshipment point for drug trafficking organizations transporting narcotics from South America, Central America and the Caribbean to the mainland United States. Puerto Rico is also a final destination point for narcotics.

The Task Force makes the following recommendation:

- The Task Force recommends that **Congress** continue to exercise its oversight authority to ensure that federal agencies and departments—including the United States Attorneys, the Federal Bureau of Investigation, the Drug Enforcement Administration, the Bureau of Alcohol, Tobacco, Firearms and Explosives, the United States Marshals Service, United States Immigration and Customs Enforcement, the Transportation Security Administration, U.S. Customs and Border Protection, the United States Coast Guard, the Office of National Drug Control Policy (ONDCP), the Puerto Rico/U.S. Virgin Islands High Intensity Drug Trafficking Area (a law enforcement program funded by ONDCP), the National Guard Bureau, the Deputy Assistant Secretary of Defense for Counternarcotics and Global Threats, U.S. Northern Command (whose area of responsibility includes Puerto Rico and the U.S. Virgin Islands), and U.S. Southern Command (whose area of responsibility includes the nations of South America, Central America, and the Caribbean, as well as the air and sea approaches to Puerto Rico from the south)—are working in coordination with each other, and with local law enforcement officials, to reduce drug trafficking and associated violence in Puerto Rico and the neighboring U.S. Virgin Islands.

The ONDCP, a component of the Executive Office of the President, prepares and publishes the annual National Drug Control Strategy, which outlines the Administration's efforts to reduce the supply of, and demand for, illegal drugs. ONDCP also prepares and publishes various reports that supplement the National Drug Control Strategy. The Office of National Drug Control Policy Reauthorization Act of 2006 (P.L. 109-469) requires ONDCP to prepare a National Southwest Border Counternarcotics Strategy, and ONDCP has published four such strategy documents. Likewise, the Northern Border Counternarcotics Strategy Act of 2010 (P.L. 111-356) requires ONDCP to prepare a Northern Border Counternarcotics Strategy, and ONDCP has

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<sup>102</sup> These [annual homicide statistics](#) are from the Puerto Rico police, and—in certain cases—vary from statistics published by other sources.

<sup>103</sup> See Puerto Rico/U.S. Virgin Islands High Intensity Drug Trafficking Area, [Drug Market Analysis 2011](#), September 2011, at page 4.

published two such strategy documents. In [House Report 113-72](#), which accompanied [H.R. 2786](#), the Financial Services and General Government Appropriations Act, 2014, the House Appropriations Committee directed ONDCP “to develop a biennial Caribbean Border Counternarcotics Strategy, on terms equivalent to the existing Southwest Border Counternarcotics Strategy and the Northern Border Counternarcotics Strategy.” The joint explanatory statement accompanying H.R. 3547, the Consolidated Appropriations Act, 2014—enacted as [P.L. 113-76](#) on January 17, 2014—expressly adopted this directive, but modified the time given to ONDCP to prepare the Caribbean Border Counternarcotics Strategy from 90 days from the date of enactment to 120 days from the date of enactment. ONDCP [published](#) the Caribbean Border Counternarcotics Strategy on January 15, 2015. Assuming ONDCP adheres to the congressional directive to publish the Caribbean Border Counternarcotics Strategy on a biennial basis, an updated strategy document will be published in 2017.

The Task Force makes the following recommendations:

- The Task Force recommends that **Congress** enshrine in permanent law—as distinct from a committee report accompanying a single-year appropriations bill—the requirement that ONDCP prepare and publish a Caribbean Border Counternarcotics Strategy, just as Congress has enshrined in permanent law the requirement that ONDCP prepare a National Southwest Border Counternarcotics Strategy and a Northern Border Counternarcotics Strategy.
- Whether or not Congress does enshrine this requirement in permanent law, the Task Force recommends that **ONDCP** update the Caribbean Border Counternarcotics Strategy every two years, and ensure that the strategy document places particular emphasis on reducing drug supply, drug demand and drug-related violence in Puerto Rico and the U.S. Virgin Islands, the two U.S. jurisdictions in the Caribbean region.

For over a century, federal law has provided that the collection of certain duties, taxes and fees in Puerto Rico by U.S. Customs and Border Protection (CBP)—or its predecessor agencies—are to be deposited in what is often referred to as the Puerto Rico Trust Fund.<sup>104</sup> Pursuant to federal law and an implementing agreement between the federal government and the government of Puerto Rico, a significant portion of that revenue is used to fund certain federal operations in Puerto Rico, including the maritime operations of CBP’s Office of Air and Marine Operations. Because of a shortfall in the Puerto Rico Trust Fund due to reduced customs collections in Fiscal Year 2011, CBP closed a maritime unit in San Juan that, in prior years, had seized a significant quantity of illegal drugs. CBP took this action because it interpreted current federal law to require that it use either the Puerto Rico Trust Fund or the CBP Salaries and Expenses appropriation, but not both, in order to fund its operations in Puerto Rico. As a result, the Department of Homeland Security appropriations bill for Fiscal Year 2015 and Fiscal Year 2016

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<sup>104</sup> See 48 U.S.C. 740 and 48 U.S.C. 795.

each include language authorizing CBP to supplement funding from the Trust Fund with general appropriations when necessary to maintain or to temporarily increase operations in Puerto Rico.

The Task Force makes the following recommendation:

- The Task Force recommends that **Congress** continue its current policy of providing CBP's Office of Air and Marine Operations with flexibility to use both the Puerto Rico Trust Fund and general appropriations to maintain or temporarily increase its operations in Puerto Rico.

## 11. Municipal Solid Waste Landfills

On October 14<sup>th</sup>, the Task Force held a staff-level briefing via phone with officials from the U.S. Environmental Protection Agency to discuss the subject of Puerto Rico's municipal solid waste landfills. Some members of the Task Force also met with representatives from Puerto Rico Limpio ("Clean Puerto Rico"), a Puerto Rico-based organization that has pursued an aggressive public campaign to raise awareness about the troubled state of Puerto Rico's landfills and about what Puerto Rico Limpio believes to be inadequate efforts on the part of EPA and the Puerto Rico Environmental Quality Board to address this matter. Although this issue falls somewhat outside of the Task Force's domain, the Task Force would be remiss if it did not discuss it briefly, given the risks to public health and the environment that appear to be posed by the status quo.

The Resource Conservation and Recovery Act of 1976 (RCRA) instituted the first federal permit program for hazardous waste management programs and prohibited open dumps. According to EPA's briefing to the Task Force and EPA's [website](#), there used to be approximately 70 landfills in Puerto Rico, many of which were "open dumps" and were closed post-RCRA. Currently, there are "approximately 29 operating landfills in Puerto Rico, the majority of which are beyond capacity." Most of these landfills are owned by the government of the municipality in which the landfill is located, and operated by the municipal government or a private company.

EPA notes that the Puerto Rico Environmental Quality Board (EQB) has had primary responsibility for regulating solid waste landfills on the island since 1994, when EPA approved EQB's solid waste compliance and enforcement program. Since 2007, EPA has reached [legal agreements](#) with 12 municipal governments to improve landfill operations and to place those landfills on a schedule for closure, and EPA indicates that it is "continuing to assess landfills throughout Puerto Rico and to develop legal agreements where appropriate." EPA reached these legal agreements pursuant to Section 7003 of RCRA, which authorizes EPA to take appropriate action if the handling or storage of solid waste "may present an imminent and substantial endangerment to health or the environment." According to a chart provided to the Task Force by EPA, about 70 percent of Puerto Rico's landfills are in violation of 40 CFR 258, EPA's

regulations governing solid waste management, including a number of landfills that EPA has not yet scheduled for closure.

Puerto Rico Limpio argues that EPA's efforts are insufficient, and that the agency should move more quickly to close non-compliant landfills and even rescind its 1994 approval of EQB's solid waste program. EPA responds that it is not practical to immediately close most landfills in Puerto Rico (particularly since proper closure requires significant funding, something the government of Puerto Rico and the island's municipal governments lack); that rescinding its approval of EQB's solid waste program would not improve the situation; and that the agency is doing the most it can in light of all of the factual and legal circumstances.

The Task Force makes the following recommendation:

- The Task Force is concerned with the state of Puerto Rico's municipal solid waste landfills, and the potential impact on public health and the environment. The Task Force recommends that the committees of jurisdiction in **Congress** examine this issue, which has only recently attracted significant public attention, to determine whether there are additional steps that can and should be taken.

## 12. Arecibo Observatory

The National Science Foundation (NSF) [owns](#) the Arecibo Observatory, a scientific research and education facility located on 118 acres of federal land in west-central Puerto Rico. The Department of Defense funded construction of the Observatory in the early 1960s to study the ionosphere. In 1969, the facility was [transferred](#) from DOD to NSF and converted to a national research center, with operations led by Cornell University. In 2011, the cooperative agreement between Cornell University and NSF expired. Following a competition, a new cooperative agreement was [awarded](#) by NSF to SRI International, with sub-awards made to Universities Space Research Association and the Universidad Metropolitana (UMET). Together, these entities form the Arecibo Management Team, which maintains and operates the Observatory on behalf of NSF. The cooperative agreement has a five-year term, ending in September 2016, although the parties have agreed to extend the agreement through March 31, 2018.

The Observatory is a leading research institution, enabling research in space and atmospheric sciences, radio astronomy and solar system radar studies. The iconic feature of the Observatory is a 305-meter-diameter spherical radio telescope, which has been used to make significant contributions to astronomy. The telescope is recognized as an engineering landmark and scientists from all over the world compete to utilize it and its supporting facilities. Currently, the Observatory serves scientific communities in various fields, while also hosting an active education and public outreach program. Observatory infrastructure includes office and

laboratory buildings, instrumentation for astronomy and physics, and lodging facilities for visiting scientists. The Observatory employs 128 people, including approximately 16 scientific staff, telescope operators, and support personnel. Many academic and research staff remotely access the Observatory to conduct research at their home institutions in the U.S. and abroad.

The Observatory has shared the results of its scientific investigations with the public since the opening of the Angel Ramos Foundation Science and Visitor Center in 1997. The visitor center provides science exhibits and a large auditorium, while the adjacent Angel Ramos Foundation Conference Center offers a classroom setting for workshops and professional meetings. The visitor center receives approximately 20,000 students per year and offers a variety of STEM-related opportunities for schoolchildren, teachers, and university students. As a result of the visitor center's role in making important research available to the public, it is included in the National Register of Historic Places (NRHP). Approximately 90,000 tourists visit the Arecibo Observatory annually, with local guided services and tour bus operators from San Juan providing day trips to the facility for a \$13 entrance fee. The Observatory attracts tourism to the Municipality of Arecibo, where the annual per capita income is less than \$10,000, and to the western part of Puerto Rico more generally.

The Observatory receives federal funding from NSF and the National Aeronautics and Space Administration (NASA). In Fiscal Year 2016, NSF provided \$8.2 million—with half provided by the NSF Division of Astronomical Sciences and half provided by the NSF Division of Atmospheric and Geospace Science—and NASA's Planetary Science Division provided \$3.7 million.

NSF has indicated that it needs to reduce funding for the Observatory, and has set forth possible alternative courses of action. On May 23, 2016, NSF published in the [Federal Register](#) a Notice of Intent to prepare an environmental impact statement.<sup>105</sup> On October 28<sup>th</sup>, NSF released its [Draft Environmental Impact Statement \(DEIS\)](#).

The DEIS analyzes [five](#) action alternatives, in addition to a no-action alternative. They are: (1) collaboration with interested parties for continued science-focused operations (NSF's preferred alternative); (2) collaboration with interested parties for transition to education-focused operations; (3) mothballing of facilities; (4) partial deconstruction and site restoration; and (5) complete deconstruction and site restoration.

As NSF acknowledges, reducing or ending operations at the Observatory would have numerous adverse socioeconomic effects in Arecibo and in Puerto Rico more generally, impacting job-creating economic activity currently generated by researchers, students and tourists. Moreover,

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<sup>105</sup> See page 32349.

the Observatory is a unique STEM resource in a low-income U.S. jurisdiction that nonetheless manages to produce some of the top STEM professionals in the nation, and the Observatory's shuttering would come at a significant social and educational cost to the island.

The Task Force received two submissions regarding the Arecibo Observatory via the email portal. One is from the Angel Ramos Foundation, which emphasized the Center's STEM-related initiatives for students and researchers in Puerto Rico. The other is from the Universidad Metropolitana, which provided background on the Observatory and the Arecibo Management Team. Both submissions strongly opposed the decommissioning of the Observatory and recommended that operations be maintained or expanded instead.

The Task Force makes the following recommendation:

- The Task Force recognizes that the Arecibo Observatory is vital to Puerto Rico in a variety of ways, and believes that science-focused and education-focused operations should be continued at the site. The Task Force recommends that the **National Science Foundation**, in collaboration with other government and non-government stakeholders, take all feasible steps to achieve this result.

### 13. Former Naval Station Roosevelt Roads

The Naval Station Roosevelt Roads (NSRR), a large naval installation in northeastern Puerto Rico consisting of approximately 8,720 acres, closed on March 31, 2004 after supporting U.S. military operations for over 60 years.<sup>106</sup> The closure of a major military base can pose significant economic challenges to the surrounding communities, particularly in the short term, but it can also present substantial economic opportunities if the transition from military use to civilian use of the property is handled properly. A key role is played by the Local Redevelopment Authority (LRA)—an entity established by a state or local government, recognized by the Secretary of Defense through its [Office of Economic Adjustment](#), and responsible for preparing and implementing the redevelopment plan for the former base.

In 2004, the government of Puerto Rico enacted a law creating an [LRA](#) for Roosevelt Roads. According to a publically-available [source](#), the LRA consists of 11 staff members and has an annual budget of about \$3 million, of which 56 percent is from the government of Puerto Rico, 41 percent is from the federal government, and 3 percent is generated by the LRA itself.

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<sup>106</sup> See [Report by the President's Task Force on Puerto Rico's Status](#), March 2011, at page 68-69; see also Naval Facilities Engineering Command, [Former Naval Station Roosevelt Roads](#).

According to the [LRA](#), the Department of Defense transferred 1,370 acres to the LRA in January 2012, and transferred 2,039 acres to the LRA in May 2013, for a total of 3,409 acres. The LRA has control of these lands and is able to execute redevelopment projects on nearly all of them. The transfer of lands from the Department of Defense to the LRA is now complete. (Of the remaining 5,000-plus acres of the former base, about 3,300 acres were transferred to the Puerto Rico Department of Natural and Environmental Resources and are being administered by the Puerto Rico Conservation Trust; the 1,600-acre airport was transferred to the Puerto Rico Ports Authority; a 140-acre beach was transferred to the municipality of Ceiba; 90 acres were transferred to other federal agencies; and a 30-acre hospital was transferred to the LRA.)

The redevelopment of NSRR has the potential to create many jobs and generate extensive economic activity in a geographic area of Puerto Rico that has high rates of unemployment and poverty. For example, the average 2015 [unemployment rate](#) in the municipality of Ceiba (population 12,000), where the NSRR is located, was 13.8 percent, while the unemployment rate in the neighboring municipalities of Naguabo (population 26,000) and Fajardo (population 33,000) was 13.3 percent and 14.8 percent, respectively.<sup>107</sup>

Recently, the federal government has taken steps to support the redevelopment of the NSRR. For example, in August 2015, the U.S. Small Business Administration (SBA) announced the [designation](#) of the NSRR as a Historically Underutilized Business Zone (HUBZone), which will enable small firms located within the former base to better compete for contracts to supply the federal government with goods and services. In addition, in June 2016 the federal government [designated](#) the NSRR as one of 22 “Promise Zones” throughout the United States. Promise Zones are federal-local partnerships in which economically-distressed areas receive priority access to federal investments and other forms of federal assistance.

Based on the foregoing, all of the pieces are in place for the former base to be redeveloped for the economic benefit of the people of Puerto Rico.

However, now that over 12 years have transpired since the base was closed and over three years have passed since the transfer of property from the Department of Defense to the LRA was completed, a candid assessment is in order. The effort to redevelop the former base has been slow. It has suffered from the same excessive degree of political interference that delays and disrupts far too many economic development projects in Puerto Rico. And it has been characterized by a redevelopment strategy that lacks coherence and consistency, shifting from one local administration to the next, and even from year to year within the same administration. To date, all of these efforts have resulted in the creation of [less than 50 jobs](#).

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<sup>107</sup> See generally Tri-City Partnership (consisting of the mayors of Ceiba, Naguabo and Fajardo), Submission to Congressional Task Force on Economic Growth in Puerto Rico.

The Task Force makes the following recommendation:

- The Task Force is concerned by the slow pace of the effort to redevelop the former Naval Station Roosevelt Roads (NSRR) for the economic benefit of the people of Puerto Rico. The Task Force believes a well-planned and well-executed redevelopment strategy has the potential to transform eastern Puerto Rico. The Task Force recommends that the **government of Puerto Rico**, working in conjunction with the Revitalization Coordinator established in Section 502 of PROMESA, elected leaders of the surrounding communities, federal government partners, and the private sector, prioritize the efficient and effective redevelopment of the NSRR. The Task Force urges the Local Redevelopment Authority responsible for overseeing the redevelopment effort to develop a sensible and sustained strategy.

#### 14. Caño Martín Peña (Martín Peña Channel)

For approximately three decades, plans have been developed but not implemented to restore the Caño Martín Peña (Martín Peña Channel), a natural channel that connects the San Juan Bay with the San José Lagoon in metropolitan San Juan. The tidal flow between these two bodies of water and the flushing of the San José Lagoon has been impeded by persistent sedimentation and debris accumulation in the Caño. Many of the communities along the Caño lack sewer systems. Health studies have determined that frequent flooding in these communities is associated with high rates of gastrointestinal disease, asthma, and skin rashes among residents, particularly children. Habitat for fish and wildlife has also been lost due to water quality degradation.

Through the Water Resources Development Act of 2007 (WRDA), Congress provided a process for authorizing the restoration of Caño Martín Peña as a U.S. Army Corps of Engineers civil works project. On May 18, 2016, the Assistant Secretary of the Army for Civil Works signed a record of decision approving the [final feasibility report and environmental impact statement](#) for this project. The plan generally calls for the Corps of Engineers to dredge approximately 2.2 miles of the eastern half of the Caño to a width of 100 feet and a depth of 10 feet. The walls of the dredged Caño are to be constructed with concrete and steel. The project, once completed, will restore the natural tidal connection between the San Juan Bay and the San José Lagoon. Residents of the eight communities along the Caño would benefit from a healthy waterway, revitalized neighborhoods, and greater economic opportunities. Their homes and critical infrastructure in the area—including the runway for the San Juan International Airport adjacent to the San José Lagoon—would face reduced flood risks.

Obstacles to project construction, which is estimated to cost a total of \$222 million, include the lack of an appropriation from Congress for the project; the limited ability of the non-federal

sponsor ENLACE, an entity of the government of Puerto Rico, to satisfy its cost sharing obligations; and legal considerations related to the relocation of households located in the project area.

The Task Force makes the following recommendation:

- The Task Force believes that the project to restore Caño Martín Peña can provide a significant return on investment for the federal government in terms of improving the economy, protecting public health, and restoring the natural environment in some of Puerto Rico’s most distressed communities. The Task Force recommends that the **U.S. Army Corps of Engineers** and the **non-federal sponsor ENLACE** finalize the Project Partnership Agreement (PPA) for the project as soon as feasible; that **Congress** consider appropriating funding to construct this project; and that **Congress** consider relaxing the cost-sharing obligations of the non-federal sponsor or otherwise taking steps to ensure that the government of Puerto Rico’s fiscal crisis does not result in forward progress on this project being halted.

## 15. Federal Interagency Advisory Council on Child Poverty

The Task Force notes a proposal made to the Task Force by the Boys and Girls Clubs of Puerto Rico and the Youth Development Institute (*Instituto de Desarrollo de la Juventud*) to temporarily establish a “Federal Interagency Advisory Council on Child Poverty,” consisting of experts from inside and outside of government, that would examine and report to Congress on steps that can be taken at the federal level to reduce child poverty, with a particular emphasis on those U.S. jurisdictions—like Puerto Rico, where nearly 64 percent of young children live below the federal poverty level—that have persistently high rates of child poverty. Under this proposal, a principal goal of the Council would be to help craft an overarching strategic framework to address multi-generational poverty. The Task Force wishes to express its appreciation to the dedicated representatives of the Boys and Girls Clubs of Puerto Rico, who took the time to arrange for Task Force staff visiting the island to meet with families residing in government-provided housing in Puerto Rico, with unemployed and underemployed individuals seeking employment, and with other community members. Individuals who are fourth-generation public housing residents underscore the need for efforts to improve economic opportunities in Puerto Rico and to address enduring child poverty on the island.

The Task Force makes the following recommendation:

- The Task Force recommends that the **federal government** consider establishing, either through congressional or executive action, a “Federal Interagency Advisory Council on Child

Poverty” or a functionally equivalent entity, which would examine and report to Congress on ways to address persistent child poverty in the United States, including its territories.

## **16. Unemployment Compensation Demonstration Project**

The Unemployment Compensation (UC) program provides income support to eligible workers through the payment of UC benefits during a period of unemployment. The UC system operates in each state, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands. Puerto Rico is considered a state under UC law. The UC program is financed by federal taxes under the Federal Unemployment Tax Act (FUTA) and by state payroll taxes under the State Unemployment Tax Acts (SUTA). These taxes are deposited in the appropriate accounts within the Unemployment Trust Fund (UTF). Most businesses in the United States, including those in Puerto Rico, are subject to both state and federal unemployment taxes. An estimated \$5.8 billion in federal unemployment taxes and \$40.9 billion in state unemployment taxes were collected in Fiscal Year 2016.

UC benefits are available for up to 26 weeks in most states, including Puerto Rico. These benefits are mostly paid for by the state out of state unemployment taxes. The federal government pays certain administrative costs only.

Federal law prescribes how a state may use its state unemployment taxes, generally requiring a state to utilize those taxes only to pay unemployment benefits. However, as part of a bipartisan compromise to extend federal unemployment insurance, Section 2102 of the [Middle Class Tax Relief and Job Creation Act of 2012](#) (P.L. 112-96) authorized states to use the revenues from their SUTA taxes for certain purposes other than paying benefits. Specifically, Section 2102 authorized the U.S. Department of Labor to allow up to 10 states, including Puerto Rico, to conduct demonstration projects to improve and accelerate the reemployment of UC claimants. Pursuant to these demonstration projects, states could provide subsidies for employer-provided training, such as wage subsidies, or provide direct disbursements, not to exceed the weekly benefit amount of an individual, to employers who hire individuals receiving UC to pay part of the cost of wages that exceed the individual’s prior benefit level. No demonstration project could be approved for more than three years and all projects were required to end by December 31, 2015.

It is generally agreed that Section 2102, and the April 2012 [guidance](#) that DOL issued to states regarding its implementation of that section, proved cumbersome and ultimately unworkable. Only one state submitted an application, no state demonstration project was approved by DOL, and the program has now expired. In 2014, legislation was introduced in the

U.S. House of Representatives to make various modifications to Section 2012 and to extend the demonstration project authority from December 31, 2015 to December 31, 2019.<sup>108</sup>

Proponents of allowing states to use UC benefits to subsidize employment assert that such initiatives can help unemployed workers receive job training and expedite reentry into the workforce. Critics raise concerns over the “quality” of jobs in which participants are often placed and point to the low percentage of participants retained after the subsidy ends.<sup>109</sup>

The Task Force makes the following recommendation:

- Given that Puerto Rico has a higher unemployment rate and lower labor force participation rate than any state, the Task Force recommends that **Congress** consider the merits and demerits of legislation to authorize Puerto Rico to have greater flexibility in its use of Unemployment Compensation benefits for the purpose of increasing employment.

## 17. Administrative Order 346

Section 409(g)(3) of PROMESA requires the Task Force to examine the “economic effect” of Administrative Order 346, issued by the Secretary of the Puerto Rico Department of Health on February 9, 2016.<sup>110</sup>

The Order required manufacturers and distributors of “natural products” and “dietary supplements” to register with, and pay certain fees to, the government of Puerto Rico. The Puerto Rico Secretary of Health characterized the Order as an effort to ensure the quality of products sold in Puerto Rico and to protect consumer health on the island. Affected manufacturers and distributors asserted that the Order constituted administrative overreach, suffered from substantive and procedural defects, and was intended primarily to raise revenue for the government, rather than to protect public health.

On September 21, 2016, the Task Force received a letter from the Puerto Rico Secretary of Health. The letter indicated that the Department of Health would issue an administrative order to place a 120-day “moratorium” on Administrative Order 346, draft a “new regulation” to replace

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<sup>108</sup> See H.R. 2509, Flexibility to Promote Reemployment Act (114<sup>th</sup> Congress; Rep. Renacci).

<sup>109</sup> See Julie M. Whittaker, “Expediting the Return to Work: Approaches in the Unemployment Compensation Program,” Congressional Research Service, May 1, 2013.

<sup>110</sup> For the English-language text of the Order, see National Products Association, Submission #1 to Congressional Task Force on Economic Growth in Puerto Rico. For the Spanish-language text of the Order, see Council for Responsible Nutrition, Submission to Congressional Task Force on Economic Growth in Puerto Rico, Attachment #1.

the Order that complied with Puerto Rico law, and hold “public hearings” so that all affected parties could provide their “comments and recommendations.”

On September 26<sup>th</sup>, Task Force staff held a phone conversation with the Secretary of Health and her advisors to discuss this subject.

The Task Force makes the following recommendation:

- If the Puerto Rico Department of Health does choose to replace Administrative Order 346 with a new regulation, the Task Force recommends to the **Puerto Rico Department of Health** that it follow through on the Secretary’s pledge to hold public hearings on the proposed regulation so that all stakeholders, whether they support or oppose administrative action, can provide comments. If a new regulation is approved, and if any affected party believes the regulation violates Puerto Rico or federal law, the Task Force notes that the affected party may avail itself of the local or federal courts in Puerto Rico, just as it could in any other U.S. jurisdiction.

## 18. Puerto Rico’s Political Status

Puerto Rico—along with American Samoa, Guam, the Northern Mariana Islands and the U.S. Virgin Islands—is an unincorporated territory of the United States. As a territory, Puerto Rico is subject to Congress’s plenary powers under the Territory Clause of the United States Constitution.<sup>111</sup> The U.S. Supreme Court has held that, so long as Congress does not abridge the fundamental rights of individuals living in the territories, Congress can enact laws that treat the territories differently than the states if there is any rational basis for the differential treatment. Puerto Rico and the other territories are treated differently than the states under a variety of federal programs.

Each of the five U.S. territories elects a single delegate to the U.S. House of Representatives, who (under current House rules approved by the membership of the House) can introduce legislation, serve on House committees, and vote on legislation at the committee stage. However, the territorial delegates cannot vote on legislation on the floor of the House. The territories do not elect U.S. senators. The territories can—and, currently, each of the five territories does—participate in presidential primaries, but the territories cannot participate in the general election for president.

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<sup>111</sup> See U.S. Constitution, Article IV, Section 3, Clause 2 (granting Congress the “Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States”).

The term “unincorporated” territory denotes that Puerto Rico retains the potential—legally speaking—to: become a state of the United States; become a sovereign nation, either fully independent from the United States or with a voluntary compact of free association with the United States; or maintain its current status.

As a practical matter, in order for Puerto Rico to change its political status, the people of Puerto Rico—through an exercise of their right to self-determination—must first request a change in status in a fair and impartial plebiscite. If the people of Puerto Rico do request a change in status, the federal government would have to enact legislation to approve the requested change.

Puerto Rico has held four plebiscites on the territory’s political status, each of which was conducted pursuant to Puerto Rico law. These plebiscites were held in 1967, 1993, 1998, and 2012.

In January 2014, Congress enacted the [Consolidated Appropriations Act, 2014](#) (P.L. 113-76). The law includes an appropriation of \$2.5 million to the State Elections Commission of Puerto Rico to be used for “objective, nonpartisan voter education about, and a plebiscite on, options that would resolve Puerto Rico’s future political status.”<sup>112</sup> The House Committee on Appropriations’ report explains this appropriation as follows:

“Puerto Rico plebiscite.—The recommendation includes \$2,500,000 for objective, nonpartisan voter education about, and a plebiscite on, options that would resolve Puerto Rico’s future political status. The funds provided for the plebiscite shall not be obligated until 45 days after the [United States] Department [of Justice] notifies the Committees on Appropriations that it approves of an expenditure plan from the Puerto Rico State Elections Commission for voter education and plebiscite administration, including approval of the plebiscite ballot. This notification shall include a finding that the voter education materials, plebiscite ballot, and related materials are not incompatible with the Constitution and laws and policies of the United States.”<sup>113</sup>

Section 402 of PROMESA states: “Nothing in this Act shall be interpreted to restrict Puerto Rico’s right to determine its future political status, including by conducting the plebiscite as authorized by Public Law 113–76.”

The Task Force makes the following recommendation:

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<sup>112</sup> See [Consolidated Appropriations Act, 2014](#), at page 57.

<sup>113</sup> See [House Report 113-171](#), at page 53.

- If the government of Puerto Rico conducts a plebiscite authorized and funded by Public Law 113-76, the Task Force recommends that **Congress** analyze the result of this plebiscite with care and seriousness of purpose, and take any appropriate legislative action.

**Appendix 1: Submissions to Puerto Rico Task Force Email Portal**

Individual or Organization	Date of Submission	Attachment		
		1	2	3
<a href="#">Manuel Abreu</a>	8/5/16			
<a href="#">Antonio M. Abradelo (Submission 1)</a>	9/16/16			
<a href="#">Antonio M. Abradelo (Submission 2)</a>	9/17/16			
<a href="#">ACME Team Agriculture, Inc.</a>	9/2/16			
<a href="#">Aeronautical and Aerospace Institute of Puerto Rico</a>	9/15/16	<a href="#">1</a>		
<a href="#">AFL-CIO</a>	9/2/16			
<a href="#">AFSCME and UAW</a>	9/2/16			
<a href="#">ALAS (The Alliance for Free Association)</a>	9/16/16			
<a href="#">Alliance for Alternative Education</a>	10/14/16			
<a href="#">Alliance for Healthcare Transformation</a>	10/13/16			
<a href="#">Carlos Aleman</a>	8/4/6			
<a href="#">Carlos Alicea</a>	9/18/16			
<a href="#">Carmen Alicea</a>	8/8/16			
<a href="#">Alvin Almodovar Molinary (Submission 1)</a>	8/7/16			
<a href="#">Alvin Almodovar Molinary (Submission 2)</a>	8/19/16			
<a href="#">Pedro L. Alvarado Reyes</a>	8/7/16			
<a href="#">Angel Alvarez</a>	9/18/16			
<a href="#">Raymond Amaral</a>	9/15/16			
<a href="#">Ambac Assurance Corporation</a>	9/2/16			
<a href="#">American Maritime Partnership</a>	9/2/16			
<a href="#">Angel Ramos Foundation</a>	9/1/16			
<a href="#">Anonymous</a>	9/15/16			
<a href="#">Aqua Pura Sustainable Water Corporation</a>	10/14/16			
<a href="#">Argos Productivity Solutions, Inc.</a>	10/22/16 (Late)			
<a href="#">Ariel Investment Management, LLC (Delaware)</a>	9/2/16			
<a href="#">Ariel Investment Management, LLC (Puerto Rico)</a>	9/1/16			
<a href="#">Emilio Arsuaga Garrido (Submission 1)</a>	8/6/16			
<a href="#">Emilio Arsuaga Garrido (Submission 2)</a>	8/11/16			
<a href="#">Emilio Arsuaga Garrido (Submission 3)</a>	8/13/16			
<a href="#">Emilio Arsuaga Garrido (Submission 4)</a>	8/20/16			
<a href="#">Emilio Arsuaga Garrido (Submission 5)</a>	9/2/16			
<a href="#">Emilio Arsuaga Garrido (Submission 6)</a>	9/12/16			
<a href="#">Emilio Arsuaga Garrido (Submission 7)</a>	9/13/16			
<a href="#">Emilio Arsuaga Garrido (Submission 8)</a>	9/13/16			
<a href="#">Emilio Arsuaga Garrido (Submission 9)</a>	10/16/16 (Late)			
<a href="#">David Ashe</a>	8/6/16			
<a href="#">Asociación de Jubilados de la Universidad de Puerto Rico, Inc.</a>	9/1/16			
<a href="#">Asociación Nacional de Tiendas de Autoservicio y Departamentales</a>	8/19/16			
<a href="#">Associated General Contractors of America, Puerto Rico Chapter</a>	10/14/16	<a href="#">1</a>		

<a href="#">Association of Financial Guaranty Insurers (AFGI)</a>	9/2/16			
<a href="#">Association of Information Technology Professionals, Puerto Rico Chapter</a>	9/2/16			
<a href="#">Association of Primary Health Care in Puerto Rico, Inc. (ASPPR)</a>	9/2/16			
<a href="#">Association of Private Colleges and Universities of Puerto Rico</a>	10/14/16			
<a href="#">Aurorita</a>	8/7/16			
<a href="#">Bacardi North America Corporation</a>	8/23/16			
<a href="#">John Bacon</a>	10/5/16			
<a href="#">Backyard Bondholders from Puerto Rico</a>	10/14/16			
<a href="#">Pedro Barcelo</a>	9/8/16			
<a href="#">Jaime Benson</a>	9/13/16			
<a href="#">Luis Bermudez, Municipality of Vieques</a>	9/3/16	<a href="#">1</a>		
<a href="#">Hon. David Bernier</a>	8/29/16			
<a href="#">Edgar Berrios Collazo</a>	8/7/16			
<a href="#">Fernando Betancourt</a>	8/15/16			
<a href="#">Hon. Eduardo Bhatia</a>	9/1/16	<a href="#">1</a>		
<a href="#">Birling Capital, LLC</a>	9/8/16			
<a href="#">Roberto Bonilla Acosta</a>	8/7/16			
<a href="#">Jason Borschow</a>	9/5/16			
<a href="#">BRISA International</a>	8/31/16			
<a href="#">Lisa Brown Masters</a>	10/3/16			
<a href="#">Richard E. Brown</a>	8/30/16			
<a href="#">Janeiri Burgos Rosario</a>	8/5/16			
<a href="#">Jorge Bustelo</a>	8/27/16			
<a href="#">Cámara de Comercio del Oeste de Puerto Rico</a>	8/27/16			
<a href="#">CAMBIO Puerto Rico</a>	9/2/16			
<a href="#">Campbell Soup Company</a>	8/18/16			
<a href="#">Jorge M. Canellas Fidalgo</a>	9/2/16			
<a href="#">Ignacio Canto (Submission 1)</a>	8/5/16			
<a href="#">Ignacio Canto (Submission 2)</a>	8/8/16			
<a href="#">Ignacio Canto (Submission 3)</a>	8/8/16			
<a href="#">Ignacio Canto (Submission 4)</a>	8/10/16			
<a href="#">Ignacio Canto (Submission 5)</a>	8/15/16			
<a href="#">Raymond Capo</a>	8/10/16			
<a href="#">Caras</a>	10/14/16			
<a href="#">Caribbean CAGE, LLC</a>	9/7/16			
<a href="#">José B. Carrion III</a>	10/14/16			
<a href="#">Miguel A. Casellas Sastre (Submission 1)</a>	8/15/16			
<a href="#">Miguel A. Casellas Sastre (Submission 2)</a>	8/15/16			
<a href="#">Center for Budget and Policy Priorities (CBPP) (Submission 1)</a>	9/2/16			
<a href="#">Center for Budget and Policy Priorities (CBPP) (Submission 2)</a>	9/28/16			
<a href="#">Center for a New Economy (CNE) (Submission 1)</a>	8/22/16			
<a href="#">Center for a New Economy (CNE) (Submission 2)</a>	10/14/16			
<a href="#">Minerva Centevo</a>	8/30/16			
<a href="#">Ricia Chansky</a>	10/6/16			
<a href="#">Jose Chaparro</a>	8/4/16			
<a href="#">Cobian Media</a>	9/1/16			
<a href="#">Coca-Cola Company</a>	9/3/16			

<a href="#">Carlos Colon</a>	8/10/16			
<a href="#">Carlos A. Colón De Armas</a>	9/2/16			
<a href="#">Hector M. De Gracia Colon</a>	8/14/16			
<a href="#">Gerald Colvin</a>	9/9/16			
<a href="#">Computype, Inc.</a>	9/2/16			
<a href="#">Congressional Hispanic Caucus</a>	9/9/16			
<a href="#">ConPRmetidos</a>	9/8/16			
<a href="#">Consultiva Internacional, Inc.</a>	8/23/16			
<a href="#">Francis Coto</a>	8/5/16			
<a href="#">Council for Responsible Nutrition</a>	10/14/16	<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>
<a href="#">Council of Former Mayors of the New Progressive Party</a>	9/2/16			
<a href="#">Mary Crespo</a>	8/10/16			
<a href="#">Alan R. Crumley</a>	10/14/16			
<a href="#">Arnaldo Cruz Colón</a>	8/5/16			
<a href="#">CSA Group</a>	8/29/16			
<a href="#">Oscar Cucurullo</a>	8/25/16			
<a href="#">Cutting Edge Superconductors</a>	9/2/16			
<a href="#">Wolfgang Daszynik</a>	9/11/16			
<a href="#">Sally Devin</a>	9/2/16			
<a href="#">Jose Diaz (Submission 1)</a>	8/22/16			
<a href="#">Jose Diaz (Submission 2)</a>	8/24/16			
<a href="#">Jose Diaz (Submission 3)</a>	8/30/16			
<a href="#">Jose Diaz (Submission 4)</a>	9/1/16			
<a href="#">Jose Diaz (Submission 5)</a>	9/1/16			
<a href="#">Jose Diaz (Submission 6)</a>	9/13/16			
<a href="#">Jose Diaz (Submission 7)</a>	9/13/16			
<a href="#">Jose Diaz (Submission 8)</a>	9/13/16			
<a href="#">Jose Diaz (Submission 9)</a>	9/30/16			
<a href="#">Jose Diaz (Submission 10)</a>	9/30/16			
<a href="#">Jose Diaz (Submission 11)</a>	10/11/16			
<a href="#">Jose A. Diaz</a>	9/16/16			
<a href="#">Roque Diaz</a>	8/5/16			
<a href="#">Dennis Dinzeo</a>	8/7/16			
<a href="#">Dipak</a>	10/14/16			
<a href="#">DISH Network Puerto Rico LLC</a>	9/2/16			
<a href="#">Sonia Domínguez</a>	9/2/16			
<a href="#">James Dornacker</a>	9/13/16			
<a href="#">Eaton</a>	9/2/16			
<a href="#">EC Waste, LLC</a>	10/14/16			
<a href="#">ENLACE Martín Peña</a>	10/14/16			
<a href="#">Entrepreneurs for Puerto Rico</a>	10/11/16			
<a href="#">Equipco, LLC</a>	9/2/16			
<a href="#">Javier Espinosa</a>	8/6/16			
<a href="#">Evertec</a>	10/14/16			
<a href="#">Express Association of America</a>	10/12/16			
<a href="#">Family Voices</a>	9/2/16			
<a href="#">Hon. Antonio J. Fas-Alzamora</a>	10/13/16			

<a href="#">Edgar J. Febles</a>	8/15/16			
<a href="#">Fabian Fejgielman</a>	9/7/16			
<a href="#">Claribel Feliciano</a>	8/7/16			
<a href="#">Miguel A. Ferrer</a>	9/8/16			
<a href="#">Julio Figueroa</a>	8/6/16			
<a href="#">Santos Figueroa Beltran</a>	8/8/16			
<a href="#">Ana M. Flores Cuadrado (Submission 1)</a>	8/8/16			
<a href="#">Ana M. Flores Cuadrado (Submission 2)</a>	8/22/16			
<a href="#">Jorge A. Flores</a>	9/8/16			
<a href="#">Raymond Flores</a>	9/8/16			
<a href="#">Thomas Forester</a>	9/18/16			
<a href="#">Foundation for Puerto Rico</a>	9/2/16			
<a href="#">Dennis Freytes (Submission 1)</a>	8/11/16			
<a href="#">Dennis Freytes (Submission 2)</a>	9/6/16			
<a href="#">Alejandro Fuentes</a>	9/13/16			
<a href="#">Fundacion Libertad</a>	9/2/16			
<a href="#">Gallardo</a>	9/8/16			
<a href="#">André M. Garcia (Submission 1)</a>	8/7/16			
<a href="#">André M. Garcia (Submission 2)</a>	8/8/16			
<a href="#">Arturo J. Garcia</a>	9/16/16			
<a href="#">Idalia Garcia and Other Puerto Rico Small Business Owners</a>	9/2/16			
<a href="#">Juan Garcia</a>	8/5/16			
<a href="#">Hon. Alejandro Garcia Padilla (Governor of Puerto Rico)</a>	8/11/16			
<a href="#">Gardy BR</a>	8/10/16			
<a href="#">David Gaynor</a>	8/5/16			
<a href="#">Ramón Gil</a>	10/14/16			
<a href="#">Laureano A. Giraldez-Rodriguez</a>	8/10/16			
<a href="#">Radames Gomez Rivera</a>	9/17/16			
<a href="#">Roger P. Gonsalves</a>	8/5/16	<a href="#">1</a>	<a href="#">2</a>	
<a href="#">Aura Gonzalez</a>	8/7/16			
<a href="#">David Gonzalez and Annette Cedeño</a>	8/30/16			
<a href="#">Giancarlo Gonzalez</a>	9/13/16			
<a href="#">Guillermo Gonzalez</a>	8/14/16			
<a href="#">Jorge Gonzalez Garcia (Submission 1)</a>	8/30/16			
<a href="#">Jorge González Garcia (Submission 2)</a>	8/31/16			
<a href="#">Jorge González Garcia (Submission 3)</a>	9/23/16			
<a href="#">Juan Marcos Gonzalez (Submission 1)</a>	9/2/16			
<a href="#">Juan Marcos Gonzalez (Submission 2)</a>	9/8/16			
<a href="#">Harvey Gonzalez</a>	8/5/16			
<a href="#">Mario Gonzalez</a>	9/3/16			
<a href="#">Francisco R. Gonzalez-Colón</a>	9/2/16			
<a href="#">Tomas Gonzalez</a>	8/4/16			
<a href="#">Alfredo Gonzalez Martinez and Jose I. Alameda-Lozada</a>	8/10/16			
<a href="#">Ydelio Gonzalez</a>	9/19/16			
<a href="#">GreenLatinos</a>	9/2/16			
<a href="#">Elias R. Gutierrez and Walter Ruiz</a>	9/16/16			

<a href="#">Yamilet Gutierrez</a>	8/6/16			
<a href="#">Hugo Guzman</a>	8/12/16			
<a href="#">Jose Enrique Guzman-Virella</a>	8/4/16			
<a href="#">Patrick Harrigan</a>	9/8/16			
<a href="#">Joseph W. Heiser</a>	9/2/16			
<a href="#">Ivan D. Hernandez</a>	8/19/16			
<a href="#">Hispanic Federation</a>	9/3/16			
<a href="#">Holding Company Grupo Cooperativo Seguros Múltiples</a>	10/14/16			
<a href="#">Hunt Development Group/Moss Construction Managers</a>	10/14/16			
<a href="#">William O. Hurtado Santiago</a>	9/15/16			
<a href="#">Igualdad</a>	9/2/16			
<a href="#">Impactivo, LLC</a>	8/31/16			
<a href="#">Frank D. Inserni (Submission 1)</a>	8/14/16			
<a href="#">Frank D. Inserni (Submission 2)</a>	8/29/16			
<a href="#">Juan Irizarry</a>	8/31/16			
<a href="#">José M. Izquierdo Encarnación</a>	9/8/16			
<a href="#">William Jaeger</a>	8/5/16			
<a href="#">Glenn P. Jenkins</a>	10/11/16	<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>
<a href="#">Carlos Jiménez</a>	8/30/16			
<a href="#">Coralaidée Jiménez</a>	9/2/16			
<a href="#">Marc Joffe</a>	9/2/16			
<a href="#">Jubilee USA</a>	9/2/16			
<a href="#">Junta de Asociaciones con Pensionados del Gobierno de Puerto Rico</a>	8/31/16			
<a href="#">Cathy Kunkel et al, Institute for Energy Economics and Financial Analysis</a>	9/6/16	<a href="#">1</a>		
<a href="#">Desmond Lachman, American Enterprise Institute</a>	8/17/16			
<a href="#">Luis E. Lao Gonzalez</a>	9/2/16			
<a href="#">Leadership Council of Aging Organizations</a>	10/14/16			
<a href="#">Jerónimo Lectora (Submission 1)</a>	8/23/16			
<a href="#">Jerónimo Lectora (Submission 2)</a>	9/1/16			
<a href="#">Jerónimo Lectora (Submission 3)</a>	10/7/16			
<a href="#">Jerónimo Lectora (Submission 4)</a>	10/14/16			
<a href="#">Hon. Ricardo J. Llerandi Cruz</a>	9/6/16			
<a href="#">Cate Long, Puerto Rico Clearinghouse</a>	9/6/16			
<a href="#">Antonio M. Longo</a>	8/10/16			
<a href="#">Carmen Lopez</a>	8/7/16			
<a href="#">Carlos Lopez</a>	9/10/16			
<a href="#">Franklin Lopez</a>	8/5/16			
<a href="#">Hector Lopez Cardona</a>	8/10/16			
<a href="#">Gilberto Lopez-Padro</a>	9/8/16			
<a href="#">John Lugo Ruiz</a>	9/27/16			
<a href="#">Arthur MacEwan and J. Tomas Hexner (Submission 1)</a>	8/25/16			
<a href="#">Arthur MacEwan and J. Tomas Hexner (Submission 2)</a>	8/25/16			
<a href="#">Arthur MacEwan and J. Tomas Hexner (Submission 3)</a>	8/25/16			
<a href="#">Arthur MacEwan and J. Tomas Hexner (Submission 4)</a>	8/25/16			
<a href="#">Arthur MacEwan and J. Tomas Hexner (Submission 5)</a>	8/25/16			
<a href="#">Arthur MacEwan and J. Tomas Hexner (Submission 6)</a>	8/25/16			

<a href="#">Alfredo Machado</a>	9/7/16			
<a href="#">Miguel A. Maldonado-Peña</a>	10/14/16			
<a href="#">Hon. Kenneth Mapp (Governor of the U.S. Virgin Islands)</a>	10/12/16			
<a href="#">Luis R. Marin</a>	8/28/16	<a href="#">1</a>		
<a href="#">Raul Marrero</a>	8/10/16			
<a href="#">David R. Martin</a>	9/6/16			
<a href="#">Julio Mateo Rodriguez</a>	9/2/16			
<a href="#">Maymijuan</a>	8/5/16			
<a href="#">Mc367700</a>	8/5/16			
<a href="#">Mech-Tech College</a>	10/13/16			
<a href="#">Medical Card System, Inc.</a>	9/2/16	<a href="#">1</a>		
<a href="#">Edwin Melendez et al. (Submission 1)</a>	10/14/16			
<a href="#">Edwin Melendez et al. (Submission 2)</a>	10/14/16			
<a href="#">Luis Melendez</a>	8/6/16			
<a href="#">Francisco Mendez</a>	10/14/16			
<a href="#">Jan Carlos Miranda</a>	8/5/16			
<a href="#">Military Retiree Community of Puerto Rico</a>	9/28/16			
<a href="#">Rafael J. Molina</a>	8/5/16			
<a href="#">Angel Montes</a>	8/5/16			
<a href="#">Luis E. Morales Falcon</a>	8/15/16			
<a href="#">Jaime Morales</a>	9/8/16			
<a href="#">Manuel Morales</a>	9/29/16			
<a href="#">Municipal Securities Rulemaking Board (MSRB)</a>	9/2/16			
<a href="#">Jose J. Muñiz</a>	9/26/16			
<a href="#">Harry Narvaez Munet</a>	8/13/16			
<a href="#">National Association of Development Companies</a>	10/14/16			
<a href="#">National Association of Government Guaranteed Lenders</a>	10/14/16			
<a href="#">National Grocers Association</a>	9/2/16			
<a href="#">National Products Association (Submission 1)</a>	9/6/16			
<a href="#">National Products Association (Submission 2)</a>	9/6/16			
<a href="#">National Products Association (Submission 3)</a>	9/6/16			
<a href="#">National Products Association (Submission 4)</a>	9/6/16			
<a href="#">National Products Association (Submission 5)</a>	9/6/16			
<a href="#">National Taxpayers Union</a>	9/2/16			
<a href="#">Manuel F. Navedo</a>	8/4/16			
<a href="#">Cesar Negrette</a>	9/2/16			
<a href="#">George R. Nethercutt</a>	10/14/16	<a href="#">1</a>	<a href="#">2</a>	
<a href="#">NETS Educational Institution</a>	10/5/16			
<a href="#">Non-Profit Community Service Organizations in Puerto Rico</a>	9/2/16			
<a href="#">Rosario Ojeda (Submission 1)</a>	8/4/16			
<a href="#">Rosario Ojeda (Submission 2)</a>	8/7/16			
<a href="#">Luis Oliveras</a>	9/6/16			
<a href="#">Jose Olmos</a>	9/1/16			
<a href="#">Opportunity Finance Network</a>	10/14/16			
<a href="#">Orlando</a>	9/7/16			
<a href="#">Julita Ortiz</a>	8/7/16			
<a href="#">Julio Ortiz</a>	9/8/16			

<a href="#">Jose Ortiz</a>	8/31/16			
<a href="#">Juan J. Otero</a>	8/6/16			
<a href="#">Dr. Hernan Padilla</a>	10/13/16			
<a href="#">Johel Padilla</a>	8/6/16			
<a href="#">Dr. Samuel Padilla et al.</a>	10/14/16			
<a href="#">Carlos M. Padin Bibiloni</a>	9/2/16			
<a href="#">Elena M. Pagán</a>	10/17/16 (Late)			
<a href="#">David Paitsel</a>	9/15/16			
<a href="#">Paul Palen</a>	8/8/16			
<a href="#">Paralle18</a>	9/2/16			
<a href="#">Mariano Parlato</a>	9/7/16			
<a href="#">PathStone Corporation</a>	10/18/16 (Late)			
<a href="#">Efrain Pena</a>	8/8/16			
<a href="#">Jose Perez Canabal</a>	9/12/16			
<a href="#">Ignacio Pino</a>	8/4/16			
<a href="#">Alex J. Pollock, American Enterprise Institute</a>	8/31/16			
<a href="#">Ponce Health Science University</a>	9/2/16			
<a href="#">Power Technologies Corporation</a>	10/13/16	<a href="#">1</a>	<a href="#">2</a>	
<a href="#">Professional College of Engineers and Land Surveyors of Puerto Rico (CIAPR)</a>	9/2/16			
<a href="#">Puerto Rican Diaspora for the University of Puerto Rico</a>	10/17/16 (Late)			
<a href="#">Puerto Rico Association of REALTORS</a>	9/2/16			
<a href="#">Puerto Rico Association of Renewable Energy Producers</a>	9/2/16			
<a href="#">Puerto Rico Bankers Association</a>	9/2/16			
<a href="#">Puerto Rico Builders Association</a>	9/2/16			
<a href="#">Puerto Rico Chamber of Commerce</a>	9/15/16	<a href="#">1</a>	<a href="#">2</a>	
<a href="#">Puerto Rico Chapter of the American College of Cardiology</a>	10/14/16			
<a href="#">Puerto Rico College of Healthcare Service Administrators</a>	9/16/16			
<a href="#">Puerto Rico College of Physicians and Surgeons</a>	9/2/16			
<a href="#">Puerto Rico Community Foundation</a>	9/2/16			
<a href="#">Puerto Rico Community Pharmacies Association (Submission 1)</a>	10/24/16 (Late)			
<a href="#">Puerto Rico Community Pharmacies Association (Submission 2)</a>	10/24/16 (Late)			
<a href="#">Puerto Rico Conservation Trust</a>	8/18/16	<a href="#">1</a>		
<a href="#">Puerto Rico District Export Council</a>	8/31/16			
<a href="#">Puerto Rico Eastern Region Tri-City Partnership</a>	9/2/16			
<a href="#">Puerto Rico Electric Power Authority</a>	9/2/16			
<a href="#">Puerto Rico Electric Power Authority Bondholders</a>	9/2/16			
<a href="#">Puerto Rico Equality Forum</a>	9/2/16			
<a href="#">Puerto Rico Export Council</a>	10/14/16			
<a href="#">Puerto Rico Farm Bureau</a>	10/14/16			
<a href="#">Puerto Rico Fast Ferries, LLC</a>	10/14/16			
<a href="#">Puerto Rico Food Marketing, Industry and Distribution Chamber (MIDA)</a>	9/2/16			

<a href="#">Puerto Rico Fundación Agenda Ciudadana</a>	9/2/16			
<a href="#">Puerto Rico Gasoline Retailers Association</a>	8/29/16			
<a href="#">Puerto Rico Healthcare Community</a>	8/4/16	<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>
<a href="#">Puerto Rico Health Information Network</a>	9/2/16			
<a href="#">Puerto Rico Hospital Association</a>	8/26/16			
<a href="#">Puerto Rico Hotel &amp; Tourism Association (Submission 1)</a>	9/2/16			
<a href="#">Puerto Rico Hotel &amp; Tourism Association (Submission 2)</a>	10/14/16			
<a href="#">Puerto Rico Information Technology Cluster (PRITC)</a>	9/1/16			
<a href="#">Puerto Rico Institute of Statistics</a>	9/2/16			
<a href="#">Puerto Rico International Insurers Association</a>	9/6/16			
<a href="#">Puerto Rico Limpio</a>	9/2/16			
<a href="#">Puerto Rico Minority Supplier Development Council</a>	9/2/16			
<a href="#">Puerto Rico Mutual Funds</a>	9/2/16			
<a href="#">Puerto Rico Private Sector Coalition (Submission 1)</a>	9/2/16	<a href="#">1</a>	<a href="#">2</a>	
<a href="#">Puerto Rico Private Sector Coalition (Submission 2)</a>	10/14/16			
<a href="#">Puerto Rico Religious Leaders</a>	9/2/16			
<a href="#">Puerto Rico Retailers Association</a>	9/2/16			
<a href="#">Puerto Rico Science, Technology, and Research Trust</a>	9/2/16			
<a href="#">Puerto Rico Senate Committee on Civil Rights, Citizen Participation and Social Economy</a>	9/2/16	<a href="#">1</a>		
<a href="#">Puerto Rico Society of CPAs</a>	9/2/16			
<a href="#">Puerto Rico Statehood Council (Submission 1)</a>	9/2/16			
<a href="#">Puerto Rico Statehood Council (Submission 2)</a>	10/5/16			
<a href="#">Puerto Rico Telecommunications Industry Alliance</a>	9/2/16			
<a href="#">Puerto Rico Telecommunications Regulatory Board</a>	9/2/16			
<a href="#">Puerto Rico United Retailers Association</a>	9/2/16			
<a href="#">Puerto Rico-USA Foundation</a>	9/2/16	<a href="#">1</a>		
<a href="#">Juan Carlos Puig (Submission 1)</a>	8/31/16			
<a href="#">Juan Carlos Puig (Submission 2)</a>	10/9/16			
<a href="#">Maggie Puig</a>	8/7/16			
<a href="#">PUMA Energy Caribe, LLC</a>	9/2/16			
<a href="#">William Radinson</a>	9/2/16			
<a href="#">Gabriel Ramirez</a>	8/5/16			
<a href="#">Gerardo Ramirez (Submission 1)</a>	8/4/16			
<a href="#">Gerardo Ramirez (Submission 2)</a>	8/10/16			
<a href="#">Jose B. Ramirez</a>	8/7/16			
<a href="#">Miriam J. Ramirez (Submission 1)</a>	8/7/16			
<a href="#">Miriam J. Ramirez (Submission 2)</a>	8/10/16	<a href="#">1</a>		
<a href="#">Miriam J. Ramirez (Submission 3)</a>	8/14/16			
<a href="#">Miriam J. Ramirez (Submission 4)</a>	8/30/16			
<a href="#">Joselín E. Ramirez-Johnson</a>	8/4/16			
<a href="#">Stuart J. Ramos</a>	8/7/16			
<a href="#">Yamel Ramos</a>	9/16/16			
<a href="#">Omar Y. Reyes Martínez</a>	9/7/16			
<a href="#">Edwin Rivera</a>	9/2/16			
<a href="#">Jorge A. Rivera</a>	8/5/16			
<a href="#">Maria Isabel Rivera (Submission 1)</a>	9/8/16			

<a href="#">Maria Isabel Rivera (Submission 2)</a>	9/8/16			
<a href="#">Miguel Rivera</a>	8/7/16			
<a href="#">Frederick Rivera Clement (Submission 1)</a>	8/5/16			
<a href="#">Frederick Rivera Clement (Submission 2)</a>	8/27/16			
<a href="#">Olivia Rivera Quiñones</a>	8/9/16			
<a href="#">Lester Rivera Rigau</a>	9/15/16			
<a href="#">Manuel Rivera Rivera</a>	8/5/16			
<a href="#">Mariano Robledo Diaz</a>	8/6/16			
<a href="#">Francisco Rodriguez-Castro</a>	10/14/16			
<a href="#">Jorge L. Rodriguez</a>	8/23/16			
<a href="#">Sirio Rodriguez</a>	8/5/16			
<a href="#">William Rodriguez</a>	8/6/16			
<a href="#">Jose Rojas</a>	8/5/16			
<a href="#">Maria del Carmen Roman</a>	8/7/16			
<a href="#">Hon. Carlos Romero-Barceló</a>	9/2/16			
<a href="#">Miguel A. Romero-Lugo</a>	10/10/16			
<a href="#">Tavo Rosado</a>	8/7/16			
<a href="#">Raul Eduardo Rosas (Submission 1)</a>	8/4/16	<a href="#">1</a>		
<a href="#">Raul Eduardo Rosas (Submission 2)</a>	9/29/16			
<a href="#">Raul Eduardo Rosas (Submission 3)</a>	10/4/16			
<a href="#">Hon. Ricardo Rossello Nevares and Hon. Jenniffer Gonzalez-Colon</a>	8/29/16			
<a href="#">Abelardo M. Ruiz</a>	8/6/16			
<a href="#">Annette Ruiz</a>	8/7/16			
<a href="#">Jose Samhan (Submission 1)</a>	8/7/16			
<a href="#">Jose Samhan (Submission 2)</a>	8/7/16			
<a href="#">Jose Samhan (Submission 3)</a>	9/4/16			
<a href="#">Michele Sanchez</a>	9/17/16			
<a href="#">Ramon A. Sanchez</a>	9/2/16			
<a href="#">San Juan Tech Meetup</a>	9/1/16			
<a href="#">Nelson R. Santana</a>	10/11/16			
<a href="#">Zoilto G. Santana Sabino</a>	9/16/16			
<a href="#">Joanna Santiago</a>	8/13/16	<a href="#">1</a>		
<a href="#">Liliana Santiago</a>	8/7/16			
<a href="#">Victor M. Santiago</a>	8/29/16			
<a href="#">Carmen Santiago-Marrero</a>	8/5/16			
<a href="#">Dave Santos</a>	8/5/16			
<a href="#">SeaOne Caribbean, LLC</a>	8/26/16			
<a href="#">Seaport Consultants Asia and Torrado Developments</a>	9/28/16			
<a href="#">Hon. Lawrence "Larry" Seilhamer (Submission 1)</a>	10/10/16			
<a href="#">Hon. Lawrence "Larry" Seilhamer (Submission 2)</a>	10/3/16			
<a href="#">Nan Selman</a>	9/16/16			
<a href="#">Semillero Ventures LLC</a>	9/2/16			
<a href="#">Roberto J. Serralles</a>	9/12/16			
<a href="#">Congressman Jose E. Serrano</a>	8/30/16			
<a href="#">Ivan Serrano</a>	8/6/16			
<a href="#">Servidores Públicos Unidos de Puerto Rico (Council 95)</a>	9/2/16			
<a href="#">Sindicato de Policías Puertorriqueños</a>	9/2/16			

<a href="#">Gary C. Smith (Submission 1)</a>	9/2/16			
<a href="#">Gary C. Smith (Submission 2)</a>	9/7/16			
<a href="#">Gary C. Smith (Submission 3)</a>	9/23/16			
<a href="#">Gary C. Smith (Submission 4)</a>	9/27/16			
<a href="#">Society, Education, and Rehabilitation of Puerto Rico, Inc. (SER)</a>	9/2/16			
<a href="#">Spaceinnova LLC</a>	9/1/16			
<a href="#">Carlos Sumpter (Submission 1)</a>	8/4/16			
<a href="#">Carlos Sumpter (Submission 2)</a>	8/15/16			
<a href="#">Tavaosiris</a>	8/4/16			
<a href="#">Rudy Thomassen</a>	9/6/16			
<a href="#">T-Mobile</a>	10/14/16			
<a href="#">Evelyn Tirado (Submission 1)</a>	8/4/16			
<a href="#">Evelyn Tirado (Submission 2)</a>	8/4/16			
<a href="#">Evelyn Tirado (Submission 3)</a>	8/4/16			
<a href="#">Jorge L. Tirado</a>	10/12/16			
<a href="#">Tourism Association of Rincon</a>	8/30/16			
<a href="#">Loren Trigo Ferre</a>	9/23/16			
<a href="#">United Automobile Importers Group</a>	10/14/16	<a href="#">1</a>		
<a href="#">United Medical Corporation</a>	9/2/16			
<a href="#">United Way of Puerto Rico</a>	9/1/16			
<a href="#">U.S. Department of Commerce</a>	9/2/16			
<a href="#">U.S. Department of Treasury and U.S. Department of Health and Human Services</a>	8/26/16			
<a href="#">Kenneth Valle</a>	9/15/16			
<a href="#">Alberto M. Varela</a>	8/24/16			
<a href="#">Hon. Victor L. Vassallo</a>	9/25/16			
<a href="#">Rafael Vazquez Leon</a>	8/17/16			
<a href="#">Héctor L. Vélez Cruz</a>	10/14/16			
<a href="#">Vieques Libre Corporation</a>	9/2/16			
<a href="#">Ricardo Villa Guillen</a>	8/5/16			
<a href="#">Manuel Villalon Silva</a>	8/5/16			
<a href="#">Tom Vincent</a>	9/7/16			
<a href="#">Miguel A. Vivaldi-Oliver</a>	9/2/16			
<a href="#">Waste Reduction Technologies, LLC</a>	8/31/16			
<a href="#">Eugene Weil</a>	10/14/16			
<a href="#">Richard Weisskoff</a>	10/10/16			
<a href="#">Christopher Young</a>	9/2/16			
<a href="#">Congressman Don Young</a>	10/14/16			
<a href="#">Youth Development Institute</a>	9/2/16	<a href="#">1</a>		
<a href="#">Ismael Zapater</a>	9/2/16			
<a href="#">Sergio Zeligman</a>	8/16/16			

**Appendix 2: Federal Programs Under Which Puerto Rico Receives Differential Treatment**

<b>Federal Programs Under Which Puerto Rico Receives Differential Treatment</b>			
<b>Program</b>	<b>Federal Agency that Administers Program</b>	<b>Congressional Committees With Jurisdiction Over Program (114th Congress)</b>	<b>Description of Differential Treatment</b>
Supplemental Nutrition Assistance Program (SNAP)/Nutrition Assistance Program (NAP)	U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS)	House Committee on Agriculture  Senate Committee on Agriculture, Nutrition and Forestry	SNAP is designed to increase the food purchasing power of eligible low-income households so they can buy a nutritionally adequate diet. The states, DC, Guam and the U.S. Virgin Islands participate in SNAP. Maximum monthly benefit allotments are tied to the cost of purchasing a nutritionally adequate low-cost diet, as measured by the USDA-created and USDA-calculated Thrifty Food Plan (TFP). Maximum allotments are standard across the 48 contiguous states and DC, but are higher in Alaska, Hawaii, Guam, and the U.S. Virgin Islands. Puerto Rico, the CNMI and American Samoa do not participate in SNAP, although the 2014 Farm Bill authorized a pilot program that may result in the CNMI's inclusion in SNAP. Effective in 1982, Congress ended Puerto Rico's participation in SNAP (then, the Food Stamp Program), which is an open-ended entitlement, and provided a nutrition assistance block grant, known as the Nutrition Assistance Program (NAP). The NAP block grant is adjusted annually for inflation as measured by the change in the cost of the contiguous states' TFP. In Fiscal Year 2016, the NAP block grant was \$1.959 billion. According to a June 2010 FNS report required by Congress, based on Fiscal Year 2009 funding levels, converting Puerto Rico from NAP to SNAP would increase the number of households that receive nutrition assistance by 15.3 percent, increase the average monthly benefit per household by 9.6 percent, and increase annual spending on benefits by \$420 million.
Supplemental Nutrition Assistance Program Education (SNAP-Ed)	U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS)	House Committee on Agriculture  Senate Committee on Agriculture, Nutrition and Forestry	A goal of SNAP-Ed is to improve the likelihood that persons eligible for SNAP will make healthy choices within a limited budget. The Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) redesigned this program's funding, transitioning from (1) an open-ended funding stream for SNAP "state agencies" that put up matching funds to (2) a formula grant that provides an allocation for all SNAP "state agencies." The authorizing statute allocates formula funding to "state agencies" and, under 7 U.S.C. 2012(r)-(s), Guam and the U.S. Virgin Islands (who participate in SNAP) are "state agencies," but Puerto Rico, the CNMI and American Samoa are not. In Fiscal Year 2017, FNS will apportion \$414 million in SNAP-Ed funding to the states, DC, Guam, and the U.S. Virgin Islands. In Fiscal Year 2015, Puerto Rico used \$516,000 of its NAP block grant for its Nutrition Education Program.
Title I-A: (1) Basic Grants, (2) Concentration Grants, (3) Targeted Grants, and (4) Education Finance Incentive	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health,	Title I-A authorizes aid to local educational agencies (LEAs) for the education of disadvantaged children. Funds are allocated to LEAs via states using four different allocation formulas specified in statute: (1) Basic Grants, (2) Concentration Grants, (3) Targeted Grants, and (4) Education Finance Incentive Grants. Under each of the four formulas, Puerto Rico is treated as a state

Grants		Education, Labor and Pensions	for determining grant amounts. However, there are special caps that apply to the amount of funding that Puerto Rico is able to receive. CRS has estimated that Puerto Rico's Fiscal Year 2016 Title I-A grants would be \$51.9 million (12.7 percent) higher in the absence of these caps, increasing from \$408 million to \$460 million.
Title I-C: Migrant Education Programs	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	Title I-C authorizes grants to state educational agencies (SEAs) for the education of migratory students. Funds are allocated by formula on the basis of each state's number of migratory students aged 3-21 and average per pupil expenditure (APPE) in the state. The allocation for Puerto Rico is based on the number of migratory children and a reduced APPE. Because Puerto Rico terminated its participation in the program in Fiscal Year 2006, CRS was unable to estimate how much funding for Puerto Rico might increase if a reduced APPE were not used.
Title I-D: Neglected, Delinquent and At-Risk Students Programs	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	Title I-D authorizes a pair of programs intended to improve education for students who are neglected, delinquent, or at risk of dropping out of school. The funds appropriated for Title I-D are used to provide state grants. Under this formula, Puerto Rico is treated as a state with one exception related to the expenditure factor used to determine Puerto Rico's grant amount. CRS has estimated that Puerto Rico's Fiscal Year 2016 Title I-D grant of \$1.0 million would be \$828,000 in the absence of this exception, which is \$174,000 lower.
Title III-A: English Language Acquisition Grants	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	Title III-A is designed to help ensure that English learners (ELs) and immigrant students attain English proficiency. Formula grant allocations are made to states based on the proportion of ELs and immigrant students in each state relative to all states. Grants to Puerto Rico are capped at 0.5 percent of the total amount available for state grants. USDE estimated Puerto Rico's Fiscal Year 2016 Title III-A grant to be \$3.4 million. CRS calculated that, if the cap were increased from 0.5 percent to 2.0 percent (rather than eliminated altogether), Puerto Rico's Title III-A grant would increase by \$10.2 million, to \$13.6 million.
Title IV-A: Student Support and Academic Enrichment Grants	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	Title IV-A of the Every Student Succeeds Act (ESSA) authorizes Student Support and Academic Enrichment Grants to provide students with access to a well-rounded education, improve school conditions for student learning, and improve the use of technology. Funds are allocated via formula to state educational agencies (SEAs) based on their Title I-A grant amounts. The minimum state grant amount is 0.5 percent of the amount available to states. Puerto Rico's grant is capped at the minimum state grant amount. The block grant is authorized at \$1.65 billion for Fiscal Year 2017. CRS used a funding level of \$1.0 billion (the amount approved by the House Appropriations Committee) to estimate Fiscal Year 2017 grant amounts, and calculated that Puerto Rico's grant would be \$4.9 million with the cap and \$24.9 million without the cap, an increase of \$20.1 million.

Title IV-B: 21st-Century Community Learning Centers	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	The 21st Century Community Learning Centers program supports activities during non-school hours that offer academic enrichment and additional services, such as counseling and nutrition and health education, for school-aged children. Funds may also be used to support expanded learning programs. Formula grant allocations are made to states in proportion to their Title I-A grant amounts. Because Puerto Rico’s Title I-A grant amount is affected by special caps and other provisions that have the effect of reducing the grant amount Puerto Rico would otherwise receive, the amount of funding Puerto Rico receives under the 21st Century Community Learning Centers is less than the amount Puerto Rico would receive if its Title I-A grant amount was not reduced by special provisions. CRS has estimated that Puerto Rico’s Fiscal Year 2016 Title IV-B grants would be \$4.1 million (14.1 percent) higher in the absence of these caps, increasing from \$29.4 million to \$33.5 million.
Title V-B: Rural Education Achievement Program	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	Like Hawaii and DC, Puerto Rico is a “single LEA state”—meaning that the entire territory is considered one LEA. To be eligible for funds under Title V-B, the locale code for each school in an LEA must be classified as rural according to the National Center for Education Statistics (NCES) classification system. Since multiple schools in Puerto Rico are classified as non-rural, the territory is not eligible to receive Title V-B funds.
Title V-B: Rural and Low-Income School Program (Rural and Low-Income School Grant Program; RLIS)	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	Like Hawaii and DC, Puerto Rico is a “single LEA state”—meaning that the entire territory is considered one LEA. To be eligible for funds under Title V-B, the locale code for each school in an LEA must be classified as rural according to the National Center for Education Statistics (NCES) classification system. Since multiple schools in Puerto Rico are classified as non-rural, the territory is not eligible to receive Title V-B funds.
Education for Homeless Children and Youths—Grants for State and Local Activities	U.S. Department of Education (USDE)	House Committee on Education and the Workforce  Senate Committee on Health, Education, Labor and Pensions	The Education for Homeless Children and Youths (EHCY) program authorized under the McKinney-Vento Homeless Assistance Act provides assistance to SEAs and LEAs to ensure that all homeless children and youth have equal access to the same free, appropriate public education that is provided to other children and youth. Formula grant allocations are made to states in proportion to their Title I-A grant amounts with no hold harmless provisions applied. As Puerto Rico’s Title I-A grant amount is affected by special caps and other provisions which have the effect of reducing the grant amount Puerto Rico would otherwise receive, the amount of funding Puerto Rico receives under the Homeless Education program is less than the amount Puerto Rico would receive if its Title I-A grant amount was not reduced by the Title I-A special provisions. CRS used a funding level of \$70 million to estimate Fiscal Year 2016 grant amounts, and calculated that Puerto Rico’s grant would be \$263,000 (14.6 percent) higher in the absence of these caps, increasing from \$1.8 million to approximately \$2.1 million.
TRICARE	U.S. Department of Defense (DOD)	House Committee on Armed Services  Senate Committee on Armed Services	TRICARE is the health care program of the U.S. Department of Defense Military Health System. TRICARE has four main benefit plans: a fee-for-service option (TRICARE Standard), a health maintenance organization option (TRICARE Prime), a preferred provider option (TRICARE Extra), and a Medicare wrap-around

			<p>option for Medicare-eligible military retirees (TRICARE for Life). Military retirees are veterans who served on active duty for at least 20 years or were medically retired. Under current law, military retirees in the territories are eligible for TRICARE Standard, but not TRICARE Prime. This is because the territories are considered “overseas” locations for purposes of military health care services, and are therefore treated as the functional equivalent of foreign countries. In the states, access to TRICARE Prime is available to retirees who reside in “Prime Service Areas,” or PSAs. According to a 2015 Department of Defense report to Congress, there are PSAs in 46 of the 50 states (the exceptions being Iowa, Minnesota, Vermont, and Wisconsin) and DC. There are over 635,000 military retirees enrolled in TRICARE Prime nationwide, and approximately one million family members of retirees enrolled in TRICARE Prime, who also receive coverage under Prime. The Department of Defense has the authority under current law to extend TRICARE Prime to some or all of the territories.</p>
Supplemental Security Income (SSI)/Aid to the Aged, Blind, or Disabled (AABD)	<p>SSI: Social Security Administration (SSA)</p> <p>AABD: U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)</p>	<p>House Committee on Ways and Means</p> <p>Senate Committee on Finance</p>	<p>SSI, administered by the SSA, provides monthly cash benefits to low-income aged, blind, or disabled persons in the 50 states, DC, and the Northern Mariana Islands. In 2016, the maximum monthly SSI payment is \$733 for an individual and \$1,100 for a couple if both members are eligible for SSI. In August 2016, the average monthly SSI payment was \$540 for all recipients, \$645 for children, \$561 for working-age adults, and \$435 for seniors. Congress has not extended the SSI program to Puerto Rico, which instead participates in AABD, administered by ACF within HHS. While SSI provides monthly benefits directly to eligible individuals, the federal government provides AABD funding to the Puerto Rico government, which distributes it to eligible individuals. The Puerto Rico government must provide certain local matching funds. Based on a 2014 GAO report, and on information supplied to the Task Force by ACF, the federal government provides approximately \$24 to \$26 million annually to the Puerto Rico government, which is used to provide benefits to approximately 34,000 to 38,000 individuals, who receive an average monthly benefit of approximately \$74 to \$77 per recipient. The GAO calculated that, if Puerto Rico were included in SSI in Fiscal Year 2011, Puerto Rico beneficiaries would receive between \$1.5 billion and \$1.8 billion per year, 305,000 to 354,000 individuals would receive benefits, and the average monthly benefit would be around \$540. The Puerto Rico government would have no matching requirement for benefit payments or administrative costs.</p> <p><b>NOTE REGARDING SOCIAL SERVICES FUNDING CAP:</b> Puerto Rico is subject to an overall annual federal funding cap of \$107,255,000 set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are (1) <i>the AABD program</i>, (2) the Temporary Assistance for Needy Families (TANF) program, (3) various child welfare funding streams under Title IV-E of the Social Security Act, and (4) the Matching Grants to the territories under Section 1108(b) of the Social Security Act.</p>

Temporary Assistance for Needy Families (TANF, Title IV-A of the Social Security Act)	U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)	House Committee on Ways and Means  Senate Committee on Finance	<p>The TANF block grant provides federal grants to the states and territories for a wide range of benefits, services, and activities, including helping states and territories pay for cash welfare for needy families with children. TANF generally applies to Puerto Rico and the other territories in the same manner as it applies to the states and DC, in terms of its purpose, flexibility to use federal grants, program requirements, and the computation of the TANF basic block grant (which, in Puerto Rico, is set at \$71.6 million). TANF’s application to Puerto Rico and the other territories differs in that they are ineligible for certain TANF grants—supplemental grants (not currently applicable), contingency funds, and mandatory child care funds—that certain qualifying states may receive. On the other hand, Puerto Rico and the other territories may receive special matching funds for TANF, child care, and Title IV-E foster care and permanency programs under Section 1108(b) of the Social Security Act.</p> <p>NOTE REGARDING SOCIAL SERVICES FUNDING CAP: Puerto Rico is subject to an overall annual federal funding cap of \$107,255,000 set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are (1) the AABD program, (2) <i>the Temporary Assistance for Needy Families (TANF) program</i>, (3) various child welfare funding streams under Title IV-E of the Social Security Act, and (4) the Matching Grants to the territories under Section 1108(b) of the Social Security Act.</p>
Temporary Assistance for Needy Families (TANF) Contingency Fund (Title IV-A of the Social Security Act)	U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)	House Committee on Ways and Means  Senate Committee on Finance	Only the 50 states and DC are eligible to receive funding under the TANF Contingency Fund; Puerto Rico and the other territories are not eligible. See 42 U.S.C. 603(b)(7). States qualify based on high unemployment, Supplemental Nutrition Assistance Program (SNAP) caseloads, and state expenditures above what was spent in Fiscal Year 1994.
Child Care Mandatory and Matching Funds of the Child Care and Development Fund (Title IV-A of the Social Security Act)	U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)	House Committee on Ways and Means  Senate Committee on Finance	Only the 50 states and DC are eligible to receive funding under the Child Care Mandatory and Matching Funds program; Puerto Rico and the other territories are not eligible. See 42 U.S.C. 618(d). There are two different mandatory child care funding streams: (1) “guaranteed” mandatory funds, and (2) mandatory matching funds. Guaranteed mandatory funds are allocated to states based on the amount each state received for certain welfare-related child care programs in Fiscal Year 1994 or Fiscal Year 1995, or the average of Fiscal Year 1992-Fiscal Year 1994, whichever is greater. Mandatory matching funds are distributed to states based on their relative share of children under age 13. To receive their full share of mandatory matching funds, states must meet maintenance-of-effort and matching requirements.
Title IV-E Foster Care, Adoption Assistance, Guardianship Assistance Program (Title IV-E of the Social Security Act)	U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)	House Committee on Ways and Means  Senate Committee on Finance	Title IV-E of the Social Security Act entitles states and territories with an approved Title IV-E plan to reimbursement of part of their costs of providing foster care, adoption assistance, and kinship guardianship assistance on behalf of eligible children. Puerto Rico is the only territory with an approved Title IV-E plan. Federal Title IV-E support is offered on an open-ended basis to states, but is subject to the social services spending cap in Puerto Rico. The share of federal Title IV-E support provided is 50 percent for program administration costs; 75 percent for program training

			<p>costs; and the state or territory's Federal Medical Assistance Percentage (FMAP) for foster care maintenance, adoption assistance, and guardianship assistance payments. State FMAPs are recalculated annually and may vary from 50 percent to 83 percent; states with the highest per capita income relative to the nation receive lower federal support and vice versa. Puerto Rico's FMAP (as applied to Title IV-E) is fixed at 55 percent. For Fiscal Year 2015, Puerto Rico submitted federal Title IV-E foster care and adoption assistance claims of about \$5.4 million, primarily for foster care, and received federal reimbursement of \$2.8 million. Puerto Rico has not opted to provide Title IV-E guardianship assistance.</p> <p>Federal eligibility rules for Title IV-E foster care include state/territory-specific income limits, tied to program rules in the now-defunct Aid to Families with Dependent Children (AFDC) program, as they existed in July 1996. A federal review of Puerto Rico's Title IV-E claims in 2003 indicated that the territory did not have procedures to properly limit Title IV-E claims to children meeting these IV-E foster care eligibility criteria. Puerto Rico's Title IV-E claims subsequently dropped to nearly zero. While Puerto Rico made corrections to its claiming system, for Fiscal Year 2015 it indicated that IV-E foster care maintenance payments were provided to just 252 children on an average monthly basis.</p> <p>NOTE REGARDING SOCIAL SERVICES FUNDING CAP: Puerto Rico is subject to an overall annual federal funding cap of \$107,255,000 set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are (1) the AABD program, (2) the Temporary Assistance for Needy Families (TANF) program, (3) <i>various child welfare funding streams under Title IV-E of the Social Security Act</i>, and (4) the Matching Grants to the territories under Section 1108(b) of the Social Security Act.</p>
<p>Chafee Foster Care Independence Program, including Educational and Training Vouchers (Section 477 of the Social Security Act)</p>	<p>U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)</p>	<p>House Committee on Ways and Means</p> <p>Senate Committee on Finance</p>	<p>The John H. Chafee Foster Care Independence Program (CFCIP) authorizes funding for states and territories to provide services to help youth make a successful transition from foster care to adulthood. Funding for this program is authorized as a capped entitlement to states and territories provided they have an approved Title IV-E foster care and adoption assistance plan. Annual mandatory funding is authorized at \$140 million and is distributed by formula; the federal share of program costs is 80 percent. Funding for Chafee Educational and Training Vouchers (ETVs) is available to states and territories receiving Chafee grants and may be used to provide vouchers (valued at up to \$5,000 per year) to support post-secondary education and training for youth who have aged out (or are expected to age out) of foster care. Annual funding is authorized on a discretionary basis and is distributed by formula to each state or territory that receives CFCIP funds; the federal share of program costs is 80 percent. For Fiscal Year 2015, Congress provided just over \$43 million for the ETV program. Puerto Rico is the only territory with a Title IV-E plan and thus the only one receiving CFCIP and ETV funds. For Fiscal Year 2015, Puerto Rico's CFCIP allotment was \$1,376,075 and its ETV allotment was \$444,652.</p>

			<p>NOTE REGARDING SOCIAL SERVICES FUNDING CAP: Puerto Rico is subject to an overall annual federal funding cap of \$107,255,000 set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are (1) the AABD program, (2) the Temporary Assistance for Needy Families (TANF) program, (3) <i>various child welfare funding streams under Title IV-E of the Social Security Act</i>, and (4) the Matching Grants to the territories under Section 1108(b) of the Social Security Act.</p>
Adoption and Legal Guardianship Incentive Payments (Section 473A of the Social Security Act)	U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)	House Committee on Ways and Means  Senate Committee on Finance	<p>Adoption and Legal Guardianship Incentive Payments are awarded to states and territories (with a Title IV-E plan) that increase the rate at which children who cannot return home leave foster care to permanent adoptive families or legal guardians. Funding for incentive payments is authorized on a discretionary basis and awarded to states and territories based on their performance. For Fiscal Year 2016, Congress provided \$38 million for these incentive payments. Puerto Rico is the only territory with a Title IV-E plan and thus the only one eligible for these incentive payments. For adoptions and legal guardianships finalized in Fiscal Year 2014, the most recent data publicly available, Puerto Rico received an incentive payment of \$5,000.</p> <p>NOTE REGARDING SOCIAL SERVICES FUNDING CAP: Puerto Rico is subject to an overall annual federal funding cap of \$107,255,000 set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are (1) the AABD program, (2) the Temporary Assistance for Needy Families (TANF) program, (3) <i>various child welfare funding streams under Title IV-E of the Social Security Act</i>, and (4) the Matching Grants to the territories under Section 1108(b) of the Social Security Act.</p>
Section 1108(b) Matching Grants to the Territories (Section 1108(b) of the Social Security Act)	U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)	House Committee on Ways and Means  Senate Committee on Finance	<p>Puerto Rico and the other territories qualify for Section 1108(b) Matching Grants based on having territorial government expenditures in excess of what the territory in question spent in Fiscal Year 1995. Section 1108(b) Matching Grants may be used for TANF, including child care, or Title IV-E foster care and permanency programs. Section 1108(b) Matching Grants include a 25 percent territory government matching requirement.</p> <p>NOTE REGARDING SOCIAL SERVICES FUNDING CAP: Puerto Rico is subject to an overall annual federal funding cap of \$107,255,000 set forth in Section 1108 of the Social Security Act. The four federal programs subject to the Section 1108 cap are (1) the AABD program, (2) the Temporary Assistance for Needy Families (TANF) program, (3) <i>various child welfare funding streams under Title IV-E of the Social Security Act</i>, and (4) <i>the Matching Grants to the territories under Section 1108(b) of the Social Security Act</i>.</p>

<p>Low-Income Home Energy Assistance Program (LIHEAP)</p>	<p>U.S. Department of Health and Human Services (HHS), Administration for Children and Families (ACF)</p>	<p>House Committee on Energy and Commerce; House Committee on Education and the Workforce</p> <p>Senate Committee on Health, Education, Labor and Pensions</p>	<p>Under LIHEAP, the federal government makes annual grants to states and territories to operate home energy assistance programs for low-income households. The LIHEAP statute authorizes two types of funds: regular funds, which are allocated to all states using a statutory formula, and emergency contingency funds, which are allocated to one or more states at the discretion of the executive branch in cases of emergency. States and territories may use LIHEAP funds to help low-income households pay for heating and cooling costs, for crisis assistance, weatherization assistance, and services (such as counseling) to reduce the need for energy assistance.</p> <p>The LIHEAP statute provides that at least 0.10 percent (one-tenth of 1.0 percent) but not more than 0.50 percent (one-half of 1.0 percent) of the total regular fund appropriation must be set aside for energy assistance in the five territories. Within that range, HHS sets the exact percentage of funds that goes to the territories. From the inception of the program in the early 1980s through Fiscal Year 2013, HHS established the set-aside at approximately 0.134 percent of regular funds. This percentage was based on the amount of funding that the territories received under LIEAP, the predecessor program to LIHEAP. In FY2014, HHS set aside 0.5 percent of funding for the territories, the first time that funding had reached the maximum allowed by the statute. This set-aside has continued in appropriations since Fiscal Year 2014. HHS apportions funds among the five territories based on population, with Puerto Rico receiving approximately 90 percent of funds. In Fiscal Year 2016, Puerto Rico received \$15.1 million in LIHEAP funds.</p>
<p>Medical Assistance Program (Medicaid)</p>	<p>U.S. Department of Health and Human Services (HHS), Centers for Medicare and Medicaid Services (CMS)</p>	<p>House Committee on Energy and Commerce</p> <p>Senate Committee on Finance</p>	<p>Medicaid is a joint federal-state program that finances the delivery of medical services for low-income individuals. The territories operate Medicaid programs under federal rules that differ from those applicable to the states and DC. For example, most of the eligibility and benefit requirements for the states and DC apply to the territories, but none of the territories cover all the mandatory eligibility groups and benefits. The federal matching rate (FMAP) in the states varies according to a state's per capita income and can range from 50 percent to 83 percent, while DC's FMAP is set by statute at 70 percent. The FMAP for the territories is generally set by statute at 55 percent. Federal Medicaid funding to the states and DC is open-ended, while the Medicaid programs in the territories are subject to federal spending caps (i.e., allotments) pursuant to Section 1108 of the Social Security Act (48 U.S.C. 1308), which are adjusted annually for inflation. Puerto Rico's Section 1108 cap was \$335,300,000 in Fiscal Year 2016. The Patient Protection and Affordable Care Act (ACA; P.L. 111-148, as amended) provided \$7.3 billion in additional Medicaid federal funding to the territories, available between July 1, 2011, and September 30, 2019, of which Puerto Rico received approximately \$6.4 billion. In Fiscal Year 2016, Puerto Rico drew down approximately \$1.63 billion in combined ACA funds (\$1.3 billion) and Section 1108 funds (\$335.3 million), not including federal funding for the Children's Health Insurance Program (CHIP), funding provided through Section 1935(e) of the Social Security Act, sometimes referred to as the enhanced allotment program</p>

			(EAP), or funding for health information and technology.
State Medicaid Fraud Control Units (MFCU)	U.S. Department of Health and Human Services (HHS), Centers for Medicare and Medicaid Services (CMS)	House Committee on Energy and Commerce  Senate Committee on Finance	Section 1902(a)(61) of the Social Security Act requires each state and territory to operate an MFCU to investigate and prosecute Medicaid provider fraud and patient abuse or neglect under state law, unless the state or territory demonstrates to the satisfaction of the HHS Secretary that the operation of an MFCU would not be cost-effective,. Currently, all states (except North Dakota) and the District of Columbia have MFCUs. Provided that a state MFCU is certified (and recertified annually) by the Department of Health and Human Services Office of Inspector General, federal law provides for an enhanced federal medical assistance percentage (FMAP) for MFCUs. None of the five territories operates an MFCU, which is likely a result (at least in part) of the annual federal Medicaid funding cap that applies to the territories. None of the territories has sought or received a waiver from the Secretary.
State Health Insurance Assistance Program (SHIP)	U.S. Department of Health and Human Services (HHS), Administration for Community Living (ACL)	House Committee on Energy and Commerce  Senate Committee on Finance	<p>In the Omnibus Budget Reconciliation Act of 1990 (OBRA 90; P.L. 101-508) Congress authorized and appropriated funding from the Medicare trust funds for a “beneficiary assistance program” to help Medicare beneficiaries receive Medicare, Medicaid, and other health-insurance services. The beneficiary assistance program was later renamed the State Health Insurance Assistance Program (SHIP) and administration of the SHIP program was officially transferred from CMS to the Administration for Community Living (ACL) in 2014.</p> <p>SHIP funding is allocated to states through grants that are required to consider the percentage of Medicare beneficiaries in the state, the rural population, and state administration capacity. Section 119 of the Medicare Improvements for Patients and Providers Act of 2008 (MIPPA, P.L. 110-275) authorized additional appropriations for SHIPs and other outreach assistance programs under the Administration on Aging, a precursor to ACL. The additional MIPPA appropriation, \$13 million annually in Fiscal Year 2016 and Fiscal Year 2017, are allocated based on a statutory formula that relies in part on the percentage of Medicare beneficiaries who are eligible, but do not receive, a low-income subsidy (LIS) through Medicaid. Under Medicaid law, LIS subsidy programs are optional for the territories and none of the territories offer LIS. Thus, territories are not eligible for the additional MIPPA SHIP funding.</p>

Medicare Part A	U.S. Department of Health and Human Services (HHS), Centers for Medicare and Medicaid Services (CMS)	House Committee on Ways and Means  Senate Committee on Finance	<p>Medicare Part A provides coverage for inpatient hospital, skilled nursing facility, home health, and hospice benefits. Eligible hospitals, including hospitals in Puerto Rico, that treat a certain share of low-income patients and are reimbursed under the Medicare Inpatient Prospective Payment System (IPPS) can receive additional payments—Medicare Disproportionate Share Hospital (DSH) payments—to offset the financial effects of treating such patients. Prior to the Patient Protection and Affordable Care Act (ACA; P.L. 111-148, as amended), DSH payments were provided by a single statutory formula that increased the IPPS reimbursement amount based on the disproportionate patient percentage (DPP). The DPP was based on a hospital’s share of low-income patients, defined as the share of Medicare inpatient days for individuals entitled to federal Supplemental Security Income (SSI) benefits out of a hospital’s total Medicare inpatient days (Medicare/SSI) plus the share of Medicaid inpatient days out of the hospital’s total inpatient days.</p> <p>The ACA modified DSH funding for Fiscal Year 2014 and thereafter, splitting DSH into two payments with separate methodologies: (1) empirically justified DSH payments, which continue to be based on the traditional DPP but are reduced to 25 percent of the DSH payments that otherwise would have been provided in the absence of the ACA modification, and (2) uncompensated care payments, which are based on the most appropriate data available and, in the aggregate, are equal to the remaining 75 percent of the pre-ACA DSH amount. Currently, Medicare/SSI is a factor in calculating both payments. Residents of Puerto Rico are ineligible for SSI because the program is not available in the territory. The HHS Secretary, using administrative authority, modified the uncompensated care payment formula for Fiscal Year 2017 to use 14 percent of a Puerto Rico hospital’s Medicaid days as a proxy for Medicare/SSI days, resulting in an estimated \$12.9 million increase rather than an estimated \$3.4 million decrease in total uncompensated care payments to hospitals in Puerto Rico in Fiscal Year 2017 in the absence of the new proxy. The Secretary did not use a proxy for Medicare/SSI in the empirically justified DSH payment formula, citing that the DPP is prescribed in statute for empirically justified DSH. <u>See Social Security Act 1886(d)(5)(F)(vi).</u></p>
Medicare Part B	U.S. Department of Health and Human Services (HHS), Centers for Medicare and Medicaid Services (CMS)	House Committee on Energy and Commerce; House Committee on Ways and Means  Senate Committee on Finance	<p>Medicare Part B provides coverage for physicians’ services, outpatient hospital services, durable medical equipment, outpatient dialysis, and other medical services. Residents of every state and territory other than Puerto Rico who are receiving Social Security benefits are automatically enrolled in both Part A and Part B, and coverage begins the first day of the month they turn 65. Because beneficiaries must pay a premium for Part B coverage, they have the option of turning this coverage down. Disabled individuals who have received cash payments for 24 months under the Social Security disability programs are also automatically enrolled in Part B unless they decline such coverage. Those individuals who are not automatically enrolled in Medicare—e.g., because they have not filed for Social Security benefits—must file an application for Medicare Part A and Part B with the Social Security Administration during their seven-month initial enrollment period (IEP), which begins three months before the month in which they</p>

			<p>turn 65. Beneficiaries who do not sign up for Part B during their IEP, or who drop it and sign up again later, may have to pay a late-enrollment penalty for as long as they are enrolled in Part B. Monthly premiums for Part B may go up 10 percent for each full 12-month period that one could have had Part B but did not sign up for it. Certain low-income beneficiaries may qualify for premium assistance from Medicaid through a Medicare Savings Program (MSP). Beneficiaries in an MSP are not subject to late-enrollment penalties regardless of when they signed up for Medicare.</p> <p>Under federal statute, residents of Puerto Rico who receive Social Security benefits are automatically enrolled in Part A, but not Part B, when they turn 65. Rather, they need to sign up for Part B during their IEP or be subject to a penalty. The lack of an automatic Part B enrollment process in Puerto Rico has resulted in a disproportionate number of Puerto Rican Medicare beneficiaries paying the late-enrollment penalties. Because Puerto Rico does not have an MSP program, low-income beneficiaries subject to this penalty may be responsible for paying the full penalty amount in addition to their premiums.</p>
Medicare Part D	U.S. Department of Health and Human Services (HHS), Centers for Medicare and Medicaid Services (CMS)	House Committee on Energy and Commerce; House Committee on Ways and Means  Senate Committee on Finance	Medicare Part D provides an outpatient prescription drug benefit, either through private prescription drug plans that offer only drug coverage or through Medicare Advantage prescription drug plans that offer coverage as part of broader, managed-care plans. In the states and DC, individuals with incomes up to 150 percent of the federal poverty level and assets below set limits are eligible for assistance with their Part D premiums and cost sharing, which is known as the Part D low-income subsidy (LIS). The states and DC make annual payments, known as clawback payments, to help cover the cost of LIS. Pursuant to federal statute, residents of the territories are not eligible for LIS. In lieu of LIS, federal law provides Medicaid funding to the territories to provide Medicaid coverage of prescription drugs for low-income Medicare beneficiaries. This funding, provided through Section 1935(e) of the Social Security Act, is sometimes referred to as the enhanced allotment program (EAP). Each territory government is required to match the Section 1935(e) funding at its regular Medicaid FMAP rate of 55 percent. This means for every dollar a territory spends on providing Medicaid coverage for prescription drugs to low-income Medicare beneficiaries, the territory draws down \$0.55 from its allotted Section 1935(e) funding, up to annual limit. In Fiscal Year 2015, Puerto Rico received a Section 1935(e) allotment (i.e., the maximum amount of federal funds available for this purpose) of \$44 million, but Puerto Rico used only \$9 million of these funds as a result of the matching requirement.
Health Insurance Exchange Marketplace	U.S. Department of Health and Human Services (HHS), Centers for Medicare and Medicaid Services (CMS)	House Committee on Energy and Commerce; House Committee on Ways and Means  Senate Committee on Finance	The Patient Protection and Affordable Care Act (ACA; P.L. 111-148, as amended) requires health insurance exchanges to be established in every state and DC where individuals and small businesses purchase private health insurance coverage. States must have two types of exchanges: an individual exchange and a small business health options program exchange. Exchanges may be established either by the state itself as a state-based exchange or by the HHS Secretary as a federally-facilitated exchange. Persons who obtain coverage through the individual exchange may be eligible for financial assistance—premium tax credits and cost-

			<p>sharing subsidies—from the federal government, and small businesses that use the small business exchange may be eligible for tax credits to assist businesses with the cost of providing health insurance coverage to employees. Section 1323 of the ACA authorized each territory to elect to establish an exchange, but did not require a territory to do so. A territory that did elect to establish an exchange could receive limited federal funding for the purpose of providing premium and cost-sharing assistance for individuals who enrolled in the exchange. Section 1323 provided \$1 billion to be available for this purpose beginning in 2014 and ending in 2019, with \$925 million allocated to Puerto Rico and \$75 million allocated among the four other territories. If a territory did not establish an exchange, Section 1323 provides that the territory is entitled to an increase in Medicaid funds by the equivalent amount of its Section 1323 funding (in the case of Puerto Rico, \$925 million). No territory elected to establish an exchange and each instead received an increase in its Medicaid funding.</p>
<p>Family-to-Family Health Information Center Grant Program</p>	<p>U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA)</p>	<p>House Committee on Energy and Commerce</p> <p>Senate Committee on Finance</p>	<p>The F2F program was established as part of the Family Opportunity Act, which was included in the Deficit Reduction Act of 2005 (P.L. 109-171). Under the program, HRSA makes competitive grants to support Family-to-Family Health Information Centers. Centers are primarily non-profit organizations run by families with children and youth with special health care needs, and they provide education, training, peer support, and expertise in navigating health care systems for other families of children and youth with special health care needs. The law establishing the program makes grants available to support a single center in each of the 50 states and in DC, but not in the U.S. territories. See 42 U.S.C. 701(c)(5). The program is directly funded (not subject to the annual appropriations process) and the current annual appropriation is \$5 million. Funding is distributed equally among centers in each state and DC, with each center receiving about \$95,000 per year, regardless of the state's population.</p>
<p>Federal Home Visiting Program</p> <p>Also known as Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV)</p>	<p>U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA)</p>	<p>House Committee on Ways and Means</p> <p>Senate Committee on Finance</p>	<p>The Federal Home Visiting Program supports home visiting services for families with young children who reside in communities that have concentrations of poor child health and other risk indicators. Home visits are conducted by nurses, mental health clinicians, social workers, or others with specialized training. The law does not specify how state and territory grant funds are to be allocated to eligible entities. In practice, HRSA distributes Federal Home Visiting Program funds by both formula and competitive awards and, on its face, the funding formula treats states and territories the same. Between Fiscal Year 2010 and Fiscal Year 2015, funding was distributed according to the relative share of children under age five in families at or below 100 percent of the federal poverty line in each state. The poverty data are derived from the U.S. Census Bureau's Small Area Income Poverty Estimates (SAIPE), which are not available for the territories. There was a \$1 million funding minimum for both state and territory grantees, and HRSA allocated the minimum level of funding to each of the territories from Fiscal Year 2011 through Fiscal Year 2015.</p>

			For Fiscal Year 2016, HRSA redesigned the funding allocation for formula grants. About one-third of funding is allocated based on the share of children under age five in families at or below 100 percent of the federal poverty line in each state, again using 2013 SAIPE data that are not available for the territories. About two-thirds of funding is allocated based on the amount of competitive awards a state or territory received under the Federal Home Visiting Program between Fiscal Year 2013 and Fiscal Year 2015. There continues to be a \$1 million funding minimum for both state and territory grantees, and the territories each received the base allocation of \$1 million in Fiscal Year 2016.
Community Mental Health Services Block Grant (MHBG)	U.S. Department of Health and Human Services (HHS), Substance Abuse and Mental Health Services Administration (SAMHSA)	House Committee on Ways and Means  Senate Committee on Finance	The MHBG is a block grant program that distributes funds to states and territories according to a formula to support community mental health services for adults with serious mental illness and children with serious emotional disturbance. For states and DC, the MHBG allotment formula is based on the population at risk (weighted), the cost of providing services, and taxable resources. The minimum allotment is the amount that the state received in Fiscal Year 1998. Territories are funded pursuant to a different formula. Of MHBG funds appropriated annually, the law requires the HHS Secretary to reserve 1.5 percent for distribution to the territories. Funds are distributed among the territories in amounts proportional to their populations. The minimum allotment for the territories is \$50,000. In Fiscal Year 2016, Puerto Rico received \$6.5 million. See PHS Act 1918; 42 U.S.C. 300x-7.
Substance Abuse Prevention and Treatment Block Grants (SABG)	U.S. Department of Health and Human Services (HHS), Substance Abuse and Mental Health Services Administration (SAMHSA)	House Committee on Ways and Means  Senate Committee on Finance	The SABG is a block grant program that distributes funds to states and territories according to a formula for the purpose of supporting substance abuse prevention and treatment services. State and territories, in turn, may distribute funds to local government entities and non-profit organizations. For the states and DC, the SABG allotment formula is based on the MHBG formula and takes into account the population at risk (unweighted), the cost of services, and taxable resources. The minimum allocation is 0.375 percent of the SABG appropriation. Territories are funded pursuant to a different formula. Of SABG funds appropriated annually, the law requires the HHS Secretary to reserve 1.5 percent for distribution to the territories. Funds are distributed among the territories in amounts proportional to their populations. The minimum allotment for the territories is \$50,000. In Fiscal Year 2016, Puerto Rico received \$22.8 million. See PHS Act 1933; 42 U.S.C. 300x-33.

National Housing Trust Fund (HTF)	U.S. Department of Housing and Urban Development (HUD)	House Committee on Financial Services  Senate Committee on Banking, Housing, and Urban Affairs	The HTF was established by the Housing and Economic Recovery Act of 2008 (P.L. 110-289) to provide formula-based grants to states and territories to use for certain affordable housing activities, with a focus on producing rental housing for extremely low-income households. The HTF is funded through contributions from two government-sponsored enterprises, Fannie Mae and Freddie Mac, rather than through appropriations. The statute establishes a formula that takes into account certain factors related to rental housing for extremely low-income and very low-income households. The statute also specifies a minimum allocation for the 50 states and DC of \$3.0 million, but the minimum allocation does not apply to Puerto Rico and the other territories. HUD announced the first state allocations from the HTF in May 2016, made from funds that were set aside by Fannie Mae and Freddie Mac during calendar year 2015. Fifteen states received an amount greater than the minimum allocation of \$3.0 million (and, of those 15, five have allocations above \$4.0 million), while 35 states and DC received the minimum allocation of \$3.0 million. Puerto Rico received \$326,000.
Pittman-Robertson Fund/Federal Aid in Wildlife Restoration (Wildlife Restoration, Basic Hunter Education, Enhanced Hunter Education)	U.S. Department of the Interior (DOI), Fish and Wildlife Service (FWS)	House Committee on Natural Resources  Senate Committee on Environment and Public Works	The Pittman-Robertson Wildlife Restoration Act (WRA) uses the proceeds from a federal excise tax (on pistols, revolvers, shells, cartridges, archery equipment) to fund matching grants to states and territories for projects to benefit wildlife resources and conduct hunter education programs, with revenues going into an account called the Wildlife Restoration Fund administered by FWS. The appropriation of these funds is mandatory, indefinite spending. Distribution of funding is by formula. First, \$8 million is set aside for Enhanced Hunter Education to construct or maintain public target ranges. No more than one-sixth of 1.0 percent may be provided to each territory, while allocations to states are based on population. In Fiscal Year 2016, Puerto Rico and the other territories each received \$13,400. Next, one-half of the excise tax on pistols, revolvers, bows, and arrows (but not firearms) is set aside for Basic Hunter Education. As before, no more than one-sixth of 1 percent may be provided to each territory, while allocations to states are based on population. In Fiscal Year 2016, Puerto Rico and the other territories each received \$204,230. The remaining amount forms the bulk of the program for Wildlife Restoration. No more than one-half of 1 percent may be provided to Puerto Rico (or one-sixth of 1 percent in the case of the other territories), while allocations to states are based on a formula involving numbers of licensed hunters and state acreage. In Fiscal Year 2016, Puerto Rico received \$2,881,535.
State Wildlife Grants (SWG)	U.S. Department of the Interior (DOI), Fish and Wildlife Service (FWS)	House Committee on Appropriations  Senate Committee on Appropriations	The SWG program provides matching funds to state and territory fish and wildlife agencies to develop and implement programs that benefit wildlife and their habitats. Funding may be used to address a variety of conservation needs—such as research, fish and wildlife surveys, species restoration, habitat management, and monitoring—that are identified in a state or territory's Wildlife Action Plan. A portion of the funds appropriated is for formula grants and the other portion is for competitive grants. The program was created in P.L. 106-291 and further detailed in subsequent Interior appropriations laws; it has no separate

			authorizing statute and is a program that was originally created by the Appropriations Committees. With respect to the funds appropriated for formula grants, appropriations law provides that the allocation formula is based two-thirds on the population of each state and one-third on the land area of each state. No state may receive less than 1.0 percent or more than 5.0 percent of the amount allocated. Neither Puerto Rico nor DC may receive more than one-half of 1.0 percent, and the other territories may not receive more than one-fourth of 1.0 percent. In Fiscal Year 2016, Puerto Rico received \$241,087 in SWG formula funding and \$7,545 in competitive grants.
Dingell-Johnson Sport Fish Restoration Grants	U.S. Department of the Interior (DOI), Fish and Wildlife Service (FWS)	House Committee on Natural Resources  Senate Committee on Environment and Public Works	Excise taxes on fishing equipment, motorboat and small engine fuels, import duties, and interest are collected and appropriated from the Sport Fish Restoration and Boating Trust Fund. The Fund has a mandatory, permanent appropriation. The matching funds are made available to states and territories through grants, with funding allocated pursuant to a formula. Under Section 4 of the Dingell-Johnson Sportfish Restoration Act, no state may receive less than 1.0 percent or more than 5.0 percent of the amount allocated. Under Section 12 of the Act, neither Puerto Rico nor DC may receive more than 1.0 percent, and the other territories may not receive more than one-third of 1.0 percent. In Fiscal Year 2016, Puerto Rico received \$3,555,272 in Sport Fish Restoration grants. (Eleven states also received the same allocation of one percent.) Five other subprograms are also included in this Fund; allocation is through competitive grants. In Fiscal Year 2016, Puerto Rico did not receive any of these grants.
Land and Water Conservation Fund, State Assistance Program	U.S. Department of the Interior (DOI), National Park Service (NPS)	House Committee on Natural Resources  Senate Committee on Energy and Natural Resources	The Land and Water Conservation Fund (LWCF) Act of 1965—enacted to help preserve, develop, and ensure access to outdoor recreation resources—created the Land and Water Conservation Fund. The Fund is currently authorized through September 30, 2018, to accrue revenues of \$900 million annually from three specific sources: revenues from oil and gas leases on the Outer Continental Shelf (OCS), the federal motorboat fuel tax, and surplus property sales. A portion of the LWCF, administered by the NPS, provides matching grants to states, DC and the territories for recreation planning, acquisition of lands and waters, and facility development. To be eligible for a grant, a state or territory must prepare and update a statewide outdoor recreation plan. Under the statutory formula, a portion of the State Assistance appropriation is divided equally among 51 jurisdictions—(1) each of the 50 states and (2) the five territories and DC, which together are considered one state. This “state” share is divided among the five territories and DC in accordance with population. The remaining State Assistance appropriation is apportioned based on need, as determined by the Secretary of the Interior, taking into consideration factors in law, among others. For this purpose, the five territories and DC are each treated as separate states. In Fiscal Year 2016, Puerto Rico received a total of \$1.3 million in LWCF funding under the state grant program.
Federal Aid-Highway Program (FAHP)	U.S. Department of Transportation (DOT), Federal Highway Administration (FHWA)	House: Committee on Transportation and Infrastructure; House Committee on Ways and Means (for tax	FAHP is an umbrella term for the separate highway programs administered by the FHWA. Under the 2015 surface transportation reauthorization act—FAST Act (P.L. 114-94)—most FAHP funding is distributed through the following formula-based programs: (1) National Highway Performance Program, (2) Surface Transportation Block Grant Program, (3) Highway Safety

		<p>issues)</p> <p>Senate Committee on Environment and Public Works; Senate Committee on Finance (for tax issues)</p>	<p>Improvement Program, (4) Congestion Mitigation and Air Quality Improvement Program, (5) National Highway Freight Program, and (6) Metropolitan Planning Program. The FAST Act provides for a single gross apportionment to each state and DC, which is then divided up among the various programs. For purposes of apportioning federal-aid highway funds, Puerto Rico is not considered a state. Instead, funds are authorized for a stand-alone program called the Puerto Rico Highway Program. Under Section 1115 of the FAST Act, funding for the Puerto Rico Highway Program is authorized at \$158 million annually from Fiscal Year 2016 through Fiscal Year 2020. However, because Puerto Rico is subject to penalties under 23 U.S.C. Section 154 (Open Container Requirements), Section 158 (National Minimum Drinking Age), and Section 164 (Repeat Offenders driving while Intoxicated or driving under the influence), the \$158 million is reduced (for Fiscal Year 2016, the reduction was approximately \$15.7 million or about 10 percent). Current law directs Puerto Rico Highway Program funding to be used as follows: 50 percent for purposes eligible under the National Highway Performance Program (essentially, on National Highway System roads in Puerto Rico), 25 percent for purposes eligible under the Highway Safety Improvement Program (for safety infrastructure), and 25 percent for any purpose allowable under the Highway title of the U.S. Code (Title 23). The FAHP, as well as the Puerto Rico Highway Program, rely upon revenues from the Highway Account of the Highway Trust Fund, which is financed from a federal excise tax on motor fuels, as well as a federal tax on tires, truck and trailer sales, and heavy-vehicle use. Federal law does not impose the excise tax on motor fuel, or the other federal taxes, in Puerto Rico.</p>
<p>Motor Carrier Safety Assistance Program (MCSAP)</p>	<p>U.S. Department of Transportation (DOT), Federal Motor Carrier Safety Administration (FMCSA)</p>	<p>House Committee on Transportation and Infrastructure</p> <p>Senate Committee on Commerce, Science, and Transportation</p>	<p>The Motor Carrier Safety Assistance Program (MCSAP) is a formula grant program that provides financial assistance to states and territories to reduce the number and severity of accidents and hazardous materials incidents involving commercial motor vehicles. MCSAP grants are provided annually to the state's MCSAP lead agency, which is designated by the governor as the state motor vehicle safety agency responsible for administering the Commercial Vehicle Safety Plan within the state. There are two categories of MCSAP grants: Basic grants and Incentive grants. Basic grants are distributed pursuant to a formula that involves highway miles, vehicle miles traveled, population, and special fuel consumption. All states, DC, and the territories are eligible for Basic grants. There is a 20 percent match requirement on the part of the state lead MCSAP agency, but the state lead MCSAP agency in the four territories other than Puerto Rico are exempt from this match requirement. In addition, a state lead MCSAP agency may qualify for Incentive grants if it can demonstrate that its commercial vehicle safety program has shown improvement in certain areas. Puerto Rico and the other territories are not currently eligible for Incentive grants, evidently because the safety performance and data quality factors on which the Incentive grants are based are not available for the territories. In Fiscal Year 2016, Puerto Rico received an MCSAP Basic Grant of \$1,146,134.</p>

<p>Growing States and High Density States Program</p>	<p>U.S. Department of Transportation (DOT), Federal Transit Administration (FTA)</p>	<p>House Committee on Transportation and Infrastructure</p> <p>Senate Committee on Banking, Housing, and Urban Affairs</p>	<p>Under 49 U.S.C. 5340, funds are authorized from the Mass Transit Account of the Highway Trust Fund for two programs: the Growing State Formula Program (Section 5340(c)) and the High Density State Formula Program (Section 5340(d)). Funding from these two programs can be used by recipients for a wide variety of purposes, including capital projects, planning and, in certain circumstances, operating costs. The programs are authorized through Fiscal Year 2020. In Fiscal Year 2016, the Growing States Formula Program was authorized at \$272.3 million and the High Density States Formula Program at \$264.0 million. Funding for the Growing States Formula Program is apportioned among states based on the projected population of each state 15 years beyond the most recent decennial census. Funding is distributed to urbanized areas and rural areas within a state based on projections of the distribution of population. Funding for the High Density State Formula Program is apportioned to states with a population density greater than 370 persons per square mile. Currently, seven states qualify: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, and Maryland. Funds are distributed within states to urbanized areas only. Puerto Rico, the other territories and DC are not included within the definition of “state” in 49 U.S.C. 5340(a) and are therefore ineligible for funding under both the Growing State Formula Program and the High Density State Formula Program. According to the 2010 decennial census, Puerto Rico has a population density of 478 persons per square mile, trailing only New Jersey (and DC).</p>
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**Appendix 3: Treatment of Puerto Rico Under Major U.S. Census Bureau Statistical Programs**

<b>Table of Major U.S. Census Bureau Statistical Programs</b>					
<b>Name of Program</b>	<b>Other Federal Agency Involved?</b>	<b>Description of Program</b>	<b>Does program collect and publish state-by-state information?</b>	<b>If yes, is Puerto Rico included?</b>	<b>If no, is PR data collected and published as part of the national or regional totals?</b>
Census of Governments (six associated annual surveys directly below)	No	The Census of Governments, which is conducted every five years, identifies the scope and nature of the nation's state and local government sector; provides benchmark figures of public finance and public employment; classifies local government organizations, powers, and activities; and measures federal, state, and local fiscal relationships. The Census of Governments is comprised of the following six surveys on this list: Annual Survey of State Government Finance, Annual Survey of Local Government Finance, Annual Survey of Public Employment and Payroll, Annual Survey of Public Pensions, Annual Survey of School System Finances, Annual Survey of State Government Tax Collections. The years ending in "2" and "7" for these annual surveys are considered the Census of Governments years, and data are collected from all governments units as compared with a sample of government units in the other years.	Yes	No	N/A
Annual Survey of State Government Tax Collections (STC)	No	Provides a summary of taxes collected by state for 5 broad tax categories and up to 25 tax subcategories. These tables and data files present the details on tax collections by type of tax imposed and collected by state governments.	Yes	No	N/A
Annual Survey of State Government Finances	No	Provides statistics on revenue, expenditure, debt, and assets (cash and security holdings) for state governments. There are statistics for the 50 states and DC, as well as a national summary.	Yes	No	N/A
Annual Survey of Local Government Finances	No	Provides statistics on revenue, expenditure, debt, and assets (cash and security holdings) for local governments. There are statistics for the 50 state areas and the District of Columbia, as well as a national summary.	Yes	No	N/A
Annual Survey of Public Employment & Payroll (APES)	No	Provides state and local government data on full-time and part-time employment, part-time hours worked, full-time equivalent employment, and payroll statistics.	Yes	No	N/A

Annual Survey of Public Pensions	No	Provides revenues, expenditures, financial assets, and membership information for the defined benefit public pensions. Data are shown for individual pension funds and systems as well as at the national, state, and local level. There were 299 state-administered funds and 6,000 locally-administered defined benefit public pension systems, all of which are represented here.	Yes	No	N/A
Annual Survey of School System Finances	National Center for Education Statistics (NCES)	Provides statistics about the finances of elementary and secondary public school systems. Education finance data include revenues, expenditures, debt, and assets of elementary and secondary public school systems. Statistics cover school systems in all states and DC. This survey is co-funded by the National Center for Education Statistics, which has a stake in the survey content and data products.	Yes	No	N/A
Decennial Census of Population and Housing	No	The Decennial U.S. Census counts every resident in the United States. It is mandated by Article I, Section 2 of the Constitution and takes place every 10 years.	Yes	Yes	N/A
Economic Census	No	The Economic Census is the U.S. Government's official five-year measure of American business and the economy for planning and key economic reports, and economic development and business decisions. The last Economic Census was conducted during the year ending December 2012. In October through December 2012, nearly 4 million businesses in America received an economic census form, including most businesses with paid employees.	Yes	No, but PR is included in the Economic Census of Islands Areas	No
Advance Monthly Retail Trade and Food Services Survey (MARTS)	No	Census conducts MARTS to provide an early estimate of monthly sales by kind of business for retail and food service firms located in the United States. Each month, questionnaires are mailed to approximately 4,700 employer firms selected from the larger Monthly Retail Trade Survey (MRTS). No questionnaires are mailed to firms in PR.	No	N/A	No
American Community Survey	No	Premier source for information about America's changing population, housing and workforce.	Yes	Yes, via equivalent Puerto Rico Community Survey	N/A
American Housing Survey (AHS)	Department of Housing and Urban Development (HUD)	AHS is sponsored by HUD and conducted by Census. The survey is the most comprehensive national housing survey in the United States. The AHS is conducted biennially between May and September in odd-numbered years.	No, AHS produces national and regional statistics; statistics for the 15 largest metropolitan areas; and statistics for other selected metropolitan	No, HUD has never chosen San Juan as one of the selected metro areas.	No, PR is not included in the sample design.

			areas (usually 10-15 each survey cycle).		
American Time Use Survey (ATUS)	Department of Labor, Bureau of Labor Statistics (BLS)	ATUS measures the amount of time people spend doing various activities, such as paid work, childcare, volunteering, and socializing. ATUS data are collected via telephone interviews. Households that have completed their final (8th) month of the Current Population Survey (CPS) are eligible for the ATUS.	No	N/A	No, because PR households do not participate in the CPS.
Annual Capital Expenditures Survey (ACES)	No	ACES provides data on capital spending for new and used structures and equipment by U.S. nonfarm businesses.	No	N/A	No, businesses in PR and the other territories are excluded.
Annual Retail Trade Survey (ARTS)	No	Provides estimates on sales, e-commerce sales, end-of-year inventories, methods of inventory valuation, purchases, and operating expenses.	No	N/A	No
Annual Survey of Entrepreneurs (ASE)	Department of Commerce, Minority Business Development Agency (MBDA)	Provides estimates of number of firms, sales/receipts, annual payroll, and employment by gender, ethnicity, race, and veteran status. The ASE is a supplement to the Survey of Business Owners (SBO), which is conducted every five years as part of the Economic Census. ASE collection is electronic only. The estimate of the sample is approximately 290,000 employer businesses in operation during the survey year. Those selected for the survey receive an initial letter informing the respondents of their requirement to complete the survey.	No	N/A	No
Annual Survey of Manufactures (ASM)	No	Provides estimates on manufacturing activity, products, and location for the public and private sectors.	Yes	No	N/A
Annual Wholesale Trade Survey (AWTS)	No	Provides estimates on sales, e-commerce sales, end-of-year inventories, methods of inventory valuation, purchases, and operating expenses. The Monthly Wholesale Trade Survey (MWTS) and the AWTS work together to produce the most comprehensive data available on wholesale economic activity in the United States.	No	N/A	No
Boundary and Annexation Survey (BAS)	No	Census conducts the BAS annually to collect information about selected legally defined geographic areas. The BAS is used to update information about the legal boundaries and names of all governmental units in the United States.	Yes	Yes	N/A

Building Permits Survey (BPS)	No	Provides national, state, and local statistics on new privately-owned residential construction. Building permits data are collected from individual permit offices, most of which are municipalities. Data are also collected for PR and other U.S. territories, although these areas are excluded from the national statistics.	Yes	Yes, but data for states is published monthly and data for PR is published annually.	No
Business Dynamics Statistics (BDS)	No	Provides annual measures of business dynamics (such as job creation and destruction, establishment births and deaths, and firm startups and shutdowns) for the economy and aggregated by establishment and firm characteristics.	Yes	<b>No</b>	N/A
Business R&D and Innovation Survey (BRDIS)	National Science Foundation (NSF)	Provides data on R&D activities of companies operating in the United States, as well as statistics on the R&D workforce, intellectual property, technology transfer activities and innovation, which is useful to decision makers in both the public and private sectors.  A mail-out/mail-back sample survey of approximately 40,000 companies with 5 or more employees. Large companies with known R&D above \$3 million from the previous survey cycle are selected each year from the Business Register.	Yes	<b>No</b> , PR companies are not included in the sample.	No
Commodity Flow Survey (CFS)	Bureau of Transportation Statistics (BTS)	The CFS, undertaken through a partnership between the Census Bureau and BTS, is conducted every 5 years (years ending in “2” and “7”) as part of the Economic Census. The CFS produces data on the movement of goods in the United States, providing information on commodities shipped, their value, weight, and mode of transportation, as well as the origin and destination of shipments of commodities from manufacturing, mining, wholesale, and selected retail and services establishments. Beginning with the 2007 CFS, a sample of 100,000 establishments from the mining, manufacturing, wholesale, and selected retail industries is selected based on geographic location and industry.	Yes	<b>No</b>	N/A
Construction Progress Reporting Survey (CPRS)	No	Provides monthly estimates on the total dollar value of construction work done in the U.S. Composite estimates are based on mail-out/mail-back and interview surveys of selected construction projects and building owners, and estimates developed or compiled from other sources. These four surveys currently cover about 6,500 private nonresidential, 10,500 state and local, 1,500 multi-family, and 700 federal projects each month.	Yes. Statistics are available at the U.S. level monthly, and by division, region, and state annually for selected categories.	<b>No</b> , PR is excluded from state, regional and national totals.	N/A

Consumer Expenditure Survey (CE)	BLS	The CE program consists of the Quarterly Interview Survey and the Diary Survey, which provide information on the buying habits of American consumers, including data on their expenditures, income, and consumer unit (families and single consumers) characteristics. The survey data are collected for BLS by the Census Bureau.	Expenditures at the state level are not calculated or published, but geographic-specific data is published.	N/A	No
County Business Patterns	No	CBP is an annual series that provides subnational economic data by industry. This series includes the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll. This is not a survey, but rather a data product that relies on administrative records, the Company Organization Survey, and the Economic Census as inputs. PR is included in the CBP, although its data is published with the other territories in a separate <a href="#">file</a> .	Yes	Yes	N/A
Current Population Survey (CPS)	BLS	The CPS is a monthly survey sponsored by BLS and conducted by the U.S. Census Bureau. It is the primary source of labor force statistics for the population of the United States.	Yes	No	N/A
Economic Census of Islands Area (IA)	No	The Economic Census of Island Areas is the U.S. Government's official five-year measure of businesses and the economy used for planning, economic development, and business decisions. The last Economic Census was conducted for the year ending in December 2012. The Census Bureau mailed a questionnaire to all employer firms in PR that were classified as in-scope for the Economic Census. The Census Bureau covered roughly 38,000 establishments in PR. Respondents were instructed to reply either by mail or on-line. A telephone follow-up was conducted to obtain information from selected firms that failed to report. The Economic Census of Island Areas covers the five US territories. Data collected include total sales, receipts or revenue, kind of business, legal form of organization, employment, annual and first quarter payroll, and class of customer. Hotels, and other lodging places report additional data on sources of receipts and number of accommodations.	Yes, separate statistics are published for PR and each of the other territories	Yes	N/A
Enterprise Statistics Program (ESP)	No	The Enterprise Statistics Program (ESP) collects enterprise level data from the Report of Organization Survey (also known as the Company Organization Survey, or COS). The COS is an annual survey whose purpose is to obtain current organization and operating information on large multi-establishment enterprises in order to maintain the Business Register (BR). The BR is a multi-relational database that contains a record for each	No	N/A	No

		establishment that is located in the U.S. or Puerto Rico and has employees.			
Export Statistics	Bureau of Economic Analysis (BEA); U.S. Customs and Border Protection (CBP)	Provides detailed statistics on goods and services shipped to and from the U.S. and foreign countries. The United States Code, Title 13, requires this program. Participation is mandatory. This is covered under the International Trade Statistics Program.	Yes	Yes	N/A
Federal Audit Clearinghouse	Office of Management and Budget (OMB)	FAC operates on behalf of the Office of Management and Budget (OMB). Its primary purposes are to: distribute single audit reporting packages to federal agencies; support OMB oversight and assessment of federal award audit requirements; and maintain a public database of completed audits. Data is collected from entities in PR that expend federal awards, but data is not used in national and/or regional totals.	No	N/A	No
Government Units Survey	No	Identifies local governments for the Census of Governments, from which PR is excluded, and provides selected data on local governments. Previously known as "Directory Survey of Local Governments."	Yes	No	N/A
Housing Vacancy Survey (HVS)	No	The HVS is a Census Bureau-sponsored section within the Current Population Survey questionnaire that is conducted to inform on vacant housing units. It is not a stand-alone survey. Provides current information on rental and homeowner vacancy rates, and characteristics of units available for occupancy. These data are used by public and private sector organizations to evaluate the need for new housing programs and initiatives. In addition, the rental vacancy rate is a component of the index of leading economic indicators and is thereby used by the Federal Government and economic forecasters to gauge the current economic climate. Rental and homeowner vacancy rates and homeownership rates are available for the U.S., regions, states, and for the 75 largest Metropolitan Statistical Areas (MSAs).	Yes	No	No

Import Statistics	BEA; CBP	Provides detailed statistics on goods and estimates of services entering the U.S. from foreign countries. This is covered under the International Trade Statistics Program.	Yes	Yes	Yes
Longitudinal Employer-Household Dynamics (LEHD)		<p>Under the Local Employment Dynamics (LED) Partnership, states agree to share Unemployment Insurance earnings data and Quarterly Census of Employment and Wages (QCEW) data with the Census Bureau. The LEHD program combines these administrative data, additional administrative data and data from censuses and surveys creating statistics on employment, earnings, and job flows at detailed levels of geography and industry and for different demographic groups. The LEHD program uses these data to create partially synthetic data on workers' residential patterns. Data products released by LEHD include the Quarterly Workforce Indicators (QWI), the LEHD Origin Destination Employment Statistics (LODES), and Job-to-Job Flows (J2J). QWI is the most likely product to be available for PR in the short term. 49 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands have joined the LED Partnership, although the LEHD program is not yet producing public-use statistics for PR or the USVI.</p> <p>Data have been collected from Puerto Rico but have not been published because of quality issues with the input files. Census is currently working with its partners in Puerto Rico to address these issues with input files.</p>	Yes	<b>Not in practice.</b>	N/A
Manufactured Housing Survey	HUD	MHS is sponsored by HUD and collected by the Census Bureau, and provides data on shipments, prices and characteristics of new manufactured housing. Key statistics include "Shipments by State." Estimates of Average Sales Price of Manufactured Homes Sold or Intended for Sale for Residential Use are available at national, region, division, and state level annually and region level monthly. Estimates of Manufactured Home Shipments are available at the national and state level monthly. Estimates of shipped homes by status are available at the national level monthly. Estimates of selected characteristics of sold/placed homes are available by region.	Yes	<b>No</b>	No
Manufacturers' Shipments, Inventories, and Orders Survey (M3)	No	Provides monthly estimates on current economic conditions and indications of future production commitments in the manufacturing sector.	No	N/A	No

Manufacturers' Unfilled Orders Survey (M3UFO)	No	Collects data used to benchmark the new and unfilled orders information published in the monthly M3.	No	N/A	No
Manufacturing Energy Consumption Survey (MECS)	Department of Energy, Energy Information Administration (EIA)	Provides estimates on energy consumption in the manufacturing sector.	No	N/A	No
Medical Expenditure Panel Survey (MEPS)	Department of Health and Human Services, Agency for Healthcare Research and Quality (AHRQ)	MEPS is a set of large-scale surveys of families and individuals, their medical providers (doctors, hospitals, pharmacies, etc.), and employers across the United States. MEPS collects data on the specific health services that Americans use, how frequently they use them, the cost of these services, and how they are paid for, as well as data on the cost, scope, and breadth of health insurance held by and available to U.S. workers.	Yes	<b>No</b>	No
Monthly Retail Trade Survey (MRTS)	No	Provides monthly estimates on sales at retail and food services stores and inventories held by retail stores.	No	N/A	No
Monthly Wholesale Trade Survey (MWTS)	No	Provides monthly estimates of sales and inventories of wholesale trade industries.	No	N/A	No
National Ambulatory Medical Care Survey	CDC, National Center for Health Statistics (NCHS)	NAMCS is a national survey designed to meet the need for objective, reliable information about the provision and use of ambulatory medical care services in the United States. Findings are based on a sample of visits to non-federal employed office-based physicians who are primarily engaged in direct patient care.	No	N/A	No
National Health Interview Survey (NHIS)	NCHS	NHIS data are collected through personal household interviews. For over 50 years, the U.S. Census Bureau has been the data collection agent for the National Health Interview Survey. Survey results have been instrumental in providing data to track health status, health care access, and progress toward achieving national health objectives. An estimated 35,000 completed sample adult interviews and 12,000 completed sample child interviews are expected to be available annually for analysis in the redesigned NHIS. There are numerous data reports linked to—based on—NHIS. In the geographic classification of the U.S. population, states are grouped into the four regions used by the U.S. Census Bureau; PR is not included in any region. NCHS collects Vital Statistics (birth and death certificate data) for Puerto Rico through the National Vital Statistics System. But no information is collected in PR for other NCHS surveys. NCHS surveys target the resident civilian non-institutionalized population using the Census definition of this population which is defined as the 50 states and DC. The target population does not include persons residing	In general no, although there is state-by-state information for estimates of health insurance coverage and variation in health care service utilization. There is no PR-specific data.	<b>No</b>	No

		outside the 50 states and DC.			
National Hospital Ambulatory Care Survey (NHAMCS)	NCHS	The National Hospital Ambulatory Medical Care Survey (NHAMCS) is designed to collect data on the utilization and provision of ambulatory care services in hospital emergency and outpatient departments. Findings are based on a national sample of visits to the emergency departments and outpatient departments of non-institutional general and short-stay hospitals.	No, national and regional only.	N/A	No
National Sample Survey of Registered Nurses	Department of Health and Human Services (HHS)	Conducted every four years since 1977. The data from these periodic surveys provide the basis for evaluating trends and projection of the future supply of nursing resources. Sponsored by the Department of Health and Human Services' Health Resources and Services Administration (DHHS/HRSA), the NSSRN was last conducted by an organization other than Census in 2008. HRSA recently approached Census for the purposes of redesigning the survey, and it is anticipated that we will field the new version of the survey for the first time in January, 2018.	Yes	No	N/A
National Survey of Children's Health (NSCH)	HHS	Examines the physical and emotional health of children ages 0-17 years of age.	Yes	No	No
National Survey of College Graduates (NSCG)	National Science Foundation (NSF)	Biennial survey of college graduates residing in the United States. Sponsored by the National Science Foundation and conducted by the Census Bureau. The survey provides data on the number and characteristics of individuals with a bachelor's or higher degree, with a special focus on individuals with education and/or employment in science or engineering. NSF uses the information to prepare congressionally mandated biennial reports such as Women, Minorities and Persons with Disabilities in Science and Engineering and Science and Engineering Indicators.	In general, no. Although some state information was collected, the state-by-state estimates were not as reliable and were never published.	N/A	Yes. PR is included in the national total, but four other territories are not.
National Survey of Fishing, Hunting, and Wildlife-Associated Recreation	US Fish and Wildlife Service (FWS)	Partnership effort with the States and national conservation organizations, and has become one of the most important sources of information on fish and wildlife recreation in the United States. Quantifies the economic impact of wildlife-based recreation. Federal, State, and private organizations use this detailed information to manage wildlife, market products, and look for trends. The 2011 Survey is the twelfth in a series of surveys conducted about every 5 years since 1955.	Yes	No	No

Nonemployer Statistics	No	An annual series that provides subnational economic data for businesses that have no paid employees and are subject to federal income tax. The data consist of the number of businesses and total receipts by industry. Most nonemployers are self-employed individuals operating unincorporated businesses (known as sole proprietorships). This is not a survey, but rather a data product that primarily relies on administrative records as input.	Yes	No	N/A
Population Estimates	No	Produces estimates of the population for the United States, its states, counties, cities, and towns, as well as for Puerto Rico.	Yes	Yes	N/A
Population Projections	No	Population projections are typically based on an estimated population consistent with the most recent decennial census and are produced using the cohort-component method. The Census Bureau does not have a current set of state population projections and currently has no plans to produce them. PR residents are not included in the 2014 National Population Projection. However, PR projections have been done in the past in a separate program and may be done again in future.	Yes, but the data is old.	No, although PR is included in the projections prepared by Census as part of its International Database Program.	No, PR was not included in 2014 national population projection.
Puerto Rico Community Survey (PRCS)	No	Part of the Census Bureau's annual American Community Survey (ACS), customized for Puerto Rico.	Yes, PR only	Yes	Yes
Quarterly Financial Report (QFR)	No	Provides quarterly aggregate statistics on the financial results and position of U.S. corporations.	No	N/A	No
Quarterly Services Survey (QSS)	No	The only data source providing timely estimates of revenue and expenses for selected service industries.	No	N/A	No
Quarterly Summary of State and Local Government Tax Revenue (QTAX)	No	Provides quarterly estimates of state and local government tax revenue at a national level, as well as detailed tax revenue data for individual states.	Yes	No	N/A
Quarterly Survey of Plant Capacity Utilization (QPC)	Federal Reserve Board, Defense Logistics Agency (DLA)	Collects statistics on establishment operational status, value of actual production, estimated production attainable at full and emergency conditions, and reasons for operating at less than full production capacity.	No	N/A	No
Quarterly Survey of Public Pensions	No	Quarterly survey that provides national summary data on the revenues, expenditures, and composition of assets of the largest defined benefit public employee pension systems for state and local governments. This survey currently consists of a panel of 100 pension systems, which comprise 88.4 percent of financial activity among such entities, based on the 2012 Census of Governments.	No	N/A	No

Quarterly Workforce Indicators (QWI)	No	The QWI are a set of economic indicators including employment, job creation, earnings, and other measures of employment flows. The QWI are reported based on detailed firm characteristics (geography, industry, age, size) and worker demographics information (sex, age, education, race, ethnicity) and are available tabulated to national, state, metropolitan/micropolitan areas, county, and Workforce Investment Board (WIB) areas.	Yes	No	No
Rental Housing Finance Survey (RHFS)	HUD	Provides current and continuous measure of financial, mortgage and property characteristics of multifamily rental housing properties in the United States.	No, only national or regional statistics.	N/A	No
School Crime Supplement to the National Crime Victimization Survey (SCS/NCVS)	NCES; Bureau of Justice Statistics (BJS)	Created as a supplement to the National Crime Victimization Survey (NCVS), the SCS collects information about victimization, crime, and safety at school. The SCS is a national survey of approximately 6,500 students ages 12 through 18 in U.S. public and private elementary, middle, and high schools. None of the 6,500 students are from PR.	No	N/A	No
School Survey on Crime and Safety (SSOCS)	NCES	The primary source of school-level data on crime and safety for NCES. Over 3,000 public school principals are selected to receive the SSOCS questionnaire. None of the 3,000 public school principals selected to receive the SSOCS questionnaire are from PR.	No	N/A	No
Service Annual Survey (SAS)	No	Collects data from companies whose primary business is to provide services to individuals, businesses, and governments. Includes most personal, business, automotive, amusement and recreation, social welfare, health care, and other professional services. This is a survey of approximately 72,000 selected service businesses with paid employees. To be eligible for the list sample, service businesses must be in the Business Register List (BR), which contains all Employer Identification Numbers (EINs) for listed businesses and all locations of multi-establishment companies.	No	N/A	No
Small Area Health Insurance Estimates (SAHIE)	No	The SAHIE produces single-year estimates of health insurance coverage for all counties and states by detailed demographic and income groups. SAHIE data can be used to analyze geographic variation in health insurance coverage, as well as disparities in coverage by race/ethnicity, sex, age and income levels that reflect thresholds for state and federal assistance programs.	Yes	No	N/A

Small Area Income and Poverty Estimates (SAIPE)	No	SAIPE are produced for school districts, counties, and states. The main objective of this program is to provide updated estimates of income and poverty statistics for the administration of federal programs and the allocation of federal funds to local jurisdictions. Estimates for 2014 were released in December 2015. These estimates combine data from administrative records, post-censal population estimates, and the decennial census with direct estimates from the American Community Survey to provide consistent and reliable single-year estimates. These model-based single-year estimates are more reflective of current conditions than multi-year survey estimates.	Yes	No	N/A
Small Business Lending Survey	Federal Deposit Insurance Corporation (FDIC)	The survey will provide insight into many aspects of small business lending, including important (heretofore unavailable) nationally representative information on the general characteristics of small business borrowers to which the banks lend, the types of credit offered to small businesses (such as closed-end loans, lines-of-credit, and credit cards), and the relative importance of commercial lending activity for banks of different sizes and business models and banks with different levels of urban or rural presence.	No	N/A	No
State Government R&D Survey (SGRD)	NSF	The only source for comprehensive, uniform statistics regarding the extent of R&D activity performed and funded by departments and agencies in each of the nation's 50 state governments, the government of DC, and the government of Puerto Rico.	Yes	Yes	N/A
Statistics of U.S. Businesses (SUSB)	Small Business Administration (SBA)	Annual series that provides national and subnational data on the distribution of economic data by enterprise size and industry. SUSB covers most of the country's economic activity. Data are presented by geographic area, industry detail, and enterprise size. Annual data consist of number of firms, number of establishments, annual payroll, and employment during the week of March 12. In addition, estimated receipts data are included for years ending in 2 and 7. A compilation of data is extracted from the Business Register (BR).	Yes	No. All SUSB data are produced as cost-reimbursable special tabulations. There is no appropriated funding.	N/A

Survey of Business Owners and Self-Employed Persons (SBO)	No	<p>The SBO provides the only comprehensive, regularly collected source of information on selected economic and demographic characteristics for businesses and business owners by gender, ethnicity, race, and veteran status. Estimates include the number of employer and nonemployer firms, sales and receipts, annual payroll, and employment. Data aggregates are presented by states, metropolitan and micropolitan statistical areas, counties, places, and employment and receipts size.</p> <p>Businesses were eligible to be selected for this survey if they reported any business activity on any one of the following Internal Revenue Service tax forms: 1040 (Schedule C), 1065, (U.S. Return of Partnership Income), any one of the 1120 corporation tax forms, 941, (Employer's Quarterly Federal Tax Return), and 944, (Employer's Annual Federal Tax Return)</p>	Yes	No	No
Survey of Construction (SOC)	HUD	<p>Provides current national and regional statistics on starts, completions, and characteristics of new, privately-owned single-family and multifamily housing units and on sales of new single-family houses. HUD partially funds this survey.</p> <p>BEA uses the estimates in development of the national income and product accounts. The Federal Reserve Board and Council of Economic Advisers use the estimates to determine the condition of the economy. HUD uses the estimates to develop and evaluate housing programs. Manufacturers use estimates to plan production schedules and establish market shares. Insurance companies use estimates to adjust rates and establish replacement costs. Financial institutions use data to estimate mortgage demand.</p>	No, only national or regional statistics.	N/A	No

Survey of Income and Program Participation (SIPP)	No	SIPP collects data and measures change for many topics including: economic well-being, family dynamics, education, assets, health insurance, childcare, and food security. SIPP is a household-based survey designed as a continuous series of national panels. Each panel features a nationally representative sample interviewed over a multi-year period lasting approximately four years. SIPP is a source of data for a variety of topics and provides for the integration of information for separate topics to form a single, unified database. This allows for the examination of the interaction between tax, transfer, and other government and private policies. Government policy formulators depend heavily upon SIPP for information on the distribution of income and the success of government assistance programs. SIPP data provide the most extensive information available on how the nation's economic well-being changes over time. The 2014 SIPP Panel began in February 2014 with a sample of approximately 53,000 households based on the 2010 decennial census. Each household is interviewed four times.	Yes, although SIPP is primarily a national product, since the sample is usually too small for most states.	No	No
Survey of Market Absorption of New Multifamily Units (SOMA)	HUD	SOMA, sponsored by HUD, uses the Census Bureau's Survey of Construction (SOC) as its sampling base. Each month, a sample of residential buildings containing five or more units is selected for SOMA. Data are collected each month by the 12 Regional Offices of the Census Bureau. Interviews are conducted with the building manager, rental/sales agent, owner or builder.	No, only national or regional statistics.	N/A	No
Survey of Program Dynamics (SPD)	No	The Survey of Program Dynamics is a longitudinal, demographic survey designed to collect data on the economic, household, and social characteristics of a nationally representative sample of the U.S. population over time.	No	N/A	No
Telephone Point of Purchase Survey (TPOPS)	BLS	Collects data on where Americans are spending their money. The results of the TPOPS are used in the calculation of the Consumer Price Index (CPI). Participation in the TPOPS is based on random sampling. PR is not considered as part of the CPI calculation.	No	N/A	No
Value of Construction Put in Place Survey (VIP)	No	Provides monthly estimates of the total dollar value of construction work done in the United States (the 50 states and DC). Covers construction work done each month on new structures or improvements to existing structures for private and public sectors (in the 50 states and DC).	Yes	No	N/A

CAN LABOR REGULATION HINDER ECONOMIC PERFORMANCE?  
EVIDENCE FROM INDIA<sup>1</sup>

TIMOTHY BESLEY AND ROBIN BURGESS

This paper investigates whether the industrial relations climate in Indian states has affected the pattern of manufacturing growth in the period 1958-92. We show that states which amended the Industrial Disputes Act in a pro-worker direction experienced lowered output, employment, investment and productivity in registered or formal manufacturing. In contrast, output in unregistered or informal manufacturing increased. Regulating in a pro-worker direction was also associated with increases in urban poverty. This suggests that attempts to redress the balance of power between capital and labor can end up hurting the poor.

*JEL:* H0, H1, I3, J5, K2, L5, L6, O2, O4

I. INTRODUCTION

One of the key challenges of development economics is to identify policies that harm or hinder growth, along with an assessment of their effectiveness in poverty reduction. Traditional views of the growth process put development of manufacturing at centre stage in the structural change accompanying economic development.<sup>2</sup> A casual look at the performance of some of the more successful Asian economies after 1960 adds credence to this view. For example, between 1960 and 1995, manufacturing as a share of GDP grew from 9 percent to 24 percent of GDP in Indonesia, 8 percent to 26 percent in Malaysia and 12.5 percent to 28 percent in Thailand.<sup>3</sup> All of these countries

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<sup>2</sup>See, for example, Kaldor [1967] for an early forceful statement of this view.

<sup>3</sup>Figures on manufacturing shares come from various issues of the World Development Indicators, World Bank, Washington D.C.

had strong overall growth performances and saw significant falls in absolute poverty.

In contrast, the Indian economy did not experience a significant expansion of manufacturing as a share of national income. Manufacturing output constituted 13 percent of GDP in 1960 (ahead of the countries listed above) but grew to only 18 percent of GDP by 1995. India's overall growth over this period was also relatively modest and it did not enjoy declines in absolute poverty on a scale witnessed elsewhere in Asia. While this pattern reflects a complex array of phenomena, a key issue is whether specific policy choices can be shown to have played a role.

This paper studies the role of labor market regulation in explaining manufacturing performance in Indian states between 1958 and 1992. Such regulation is frequently cited in explanations of India's poor growth performance over this period.<sup>4</sup> The charge is that granting excessive bargaining power to organized labor blunted investment incentives and gave India a generally unfavorable business climate. Our data on labor regulation come from looking at state amendments to the Industrial Disputes Act of 1947. While the act was passed at the central level, state governments were given the right to amend it under the Indian Constitution. The emphasis on central planning in India meant that state governments have had limited influence on industrial policy outside the area of industrial relations. We read the text of each amendment (113 in all) and classified each as pro-worker, pro-employer or neutral. This gave a sense of whether workers or employers benefited or whether the legislation had no appreciable impact on either group. Regulation applies to a specific sector – formal manufacturing – smaller firms in informal manufacturing are not covered.

Between 1958 and 1992 registered manufacturing output per capita grew by 3.3 percent per annum in India as a whole. This, however, masks significant variations across states. For example, West Bengal, which had the highest level of registered manufacturing output per capita at the beginning of the period, had fallen to seventh in 1992 – an average decline of 1.5 percent per annum. West Bengal also had the largest body of pro-worker labor regulation over the period. Its performance contrasts with Andhra Pradesh which grew at nearly 6 percent per year over the same period but which enacted pro-employer labor regulation.

We develop an econometric analysis of whether regulation can account for

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<sup>4</sup>See, for example, Stern [2001] and Sachs, Varshney, and Bajpai, [1999].

the cross-state pattern of manufacturing performance over time. Our results show that pro-worker labor regulation resulted in lower output, employment, investment, and productivity in the formal manufacturing sector. Output in the informal sector increased. We also find that pro-worker labor regulation is also associated with increases in urban poverty.

The paper illuminates long-standing debates about the role of the state in promoting or hindering economic development. While there is now an abundance of cross-country evidence on determinants of growth, relatively little of this identifies robust relationships with policy regimes [see Barro, 1997]. Papers by Hall and Jones [1999] and Acemoglu, Johnson and Robinson [2001] do suggest that the quality of government institutions matter for economic performance. Looking at policies directly is, however, notoriously difficult given that the details of government intervention differ across countries. Djankov, La Porta, Lopez-de-Silanes, and Shleifer [2002] looks at regulations governing the starting of businesses in a cross-section of 85 countries. They find that countries with higher regulation of entry have less impressive performance across an array of social, political and economic indicators.<sup>5</sup> They find, in particular that greater regulation expands the size of the unofficial economy. They argue that this is in line with a public choice view of regulation as being put in place by officials or insiders intent on extracting rents (see, for example, Stigler [1971], De Soto [1989], and Shleifer and Vishny, [1998]).

Botero, Djankov, La Porta, Lopez-de-Silanes and Shliefer, [2003] code labor regulations in 85 countries, finding that heavier regulation of labor is associated with a larger unofficial economy, lower labor force participation and higher unemployment. Labor regulations are often cited as a determinant of economic performance in OECD countries [see Freeman, 1988; Blanchard, 2000; Nickell and Layard, 2000]. Higher unemployment in Europe vis a vis North America, for example, is often attributed to more ‘rigid’ labor institutions in the former [Nickell, 1997]. For European countries, Nickell and Layard [2000], argue that, labor market institutions such as unions and social security systems are important drivers of economic performance with strict labor market regulations, employment protection and minimum wages playing a lesser role. Limited institutional change and the difficulty of controlling for other policies and conditions, however, hinders identification. A number of studies interact labor institutions with observable shocks [Blanchard and Wolfers, 1999] or technological change [Card, Kramarz and Lemieux, 1999]

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<sup>5</sup>India is close to average in this dimension – it is ranked above Indonesia and Japan.

to explore dynamic effects.

Here, we utilize both time and cross-section variation in labor regulation. The relatively long time period (35 years) and the fact that so much of the policy environment is common to the Indian states makes it an ideal testing ground for the effects of regulation on economic performance and welfare. It adds to a growing body of sub-national evidence that labor regulation affects economic performance. For example, Holmes [1998] uses comparisons across U.S. state borders to show that states which enacted pro-business right-to-work laws saw increases in manufacturing activity. Bertrand and Kramarz [2002] use time and regional variation in zoning board approvals to look at how these entry regulations affected employment growth in the French retail industry. Evidence from a variety of studies on Latin America also suggest the importance of labor regulation (see the collection of studies in Heckman and Pages [2003]).

The remainder of the paper is organized as follows. In section II we examine how economic performance has varied across different states, trace the evolution of labor market regulation in India, detail how we capture the direction of regulatory change and set out theoretical predictions on the impact of regulatory change on manufacturing performance. Section III contains the empirical analysis of the effect of labor regulation on manufacturing performance. Section IV turns to the welfare consequences of regulation in terms of poverty reduction and section V concludes.

## II. BACKGROUND

Table 1 contains the descriptive statistics for the main variables that we use in our analysis. Manufacturing is comprised of two sub-sectors – an unregistered (informal) sector of small firms and a registered (formal) sector of larger firms.<sup>6</sup> During the period of our data, the latter makes up about 9 percent of state output and the former 5 percent. Firms in the registered sector are covered by the Industrial Disputes Act and are included in the Annual Survey of Industries. This provides information on output, employment, wages, investment and productivity at the state level. Firms in the unregistered sector are not covered by labor regulations and are surveyed periodically in National Sample Surveys. Figure 1 shows how registered

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<sup>6</sup>Specifically, firms are required to register if either (i) they have more than ten employees and electric power or (ii) they have more than twenty employees and do not use electric power.

manufacturing output varies across states. Some states: Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu and Maharashtra show striking growth, while states like Assam, Jammu and Kashmir and West Bengal stagnate (albeit from very different base levels). These patterns are similar if we look at employment.

A great deal of industrial regulation in India has been central. The centerpiece of the planning regime was the Industries (Regulation and Development) Act of 1951 which states that “it is expedient in the public interest that the Union should take under its control the industries in First Schedule” (this lists all the key manufacturing industries at that date). There have been no formal amendments to this act at the state level (see Malik, 1997). We therefore have a situation where industries in different states of India are subject to a common set of industrial policies except in the area of industrial relations. Entry regulation, via licensing and other instruments, for example, is completely controlled by central government.

There has been much concern about the impact of industrial licensing and the use of tariff and non-tariff barriers. It is often suggested that this has led Indian manufacturing to perform poorly relative to other countries (see Singh [1964], Bhagwati and Desai [1970] and Bhagwati and Srinivasan [1975]). In particular, relative to countries in East Asia which experienced rapid manufacturing growth (World Bank, 1993; Bhagwati, 1998). But it is not possible to relate its impact to the patterns of economic development found in Figure 1.

Increasing attention is being paid to the spatial pattern of industrial development in India. A recent survey of about one thousand manufacturing establishments drawn from ten Indian states by Dollar, Iarossi and Mengitsae [2001] suggests that productivity is forty-four percent lower in states judged by managers to have poor business climates. Labor regulation is often singled out as an important element of business climate. Dollar et al [2001] found that managers would be willing to lay-off 16-17 percent of their work force if there was greater labor market flexibility and that this measure of the cost of labor regulation had a significant negative impact on firm level productivity.

## II.A *Labor Regulation*

India is a federal democracy and under the Indian Constitution of 1949 industrial relations is a concurrent subject. This implies that central and state governments have joint jurisdiction over labor regulation legislation. The key piece of central legislation is the Industrial Disputes Act of 1947

which sets out the conciliation, arbitration and adjudication procedures to be followed in the case of an industrial dispute. The Act was designed to offer workers in the organized sector some protection against exploitation by employers. The Act is comprised of seven chapters and forty sections, specifying the powers of government, courts and tribunals, unions and workers and the exact procedures that have to be followed in resolving industrial disputes.<sup>7</sup> It has been extensively amended by state governments during the post-Independence period. It is these amendments that we use to study the impact of labor market regulation on manufacturing performance and poverty.

We code legislation based on our reading of all state level amendments to the Industrial Disputes Act of 1947 from Malik [1997]. There were 113 such amendments since the Act was passed. Thus although all states have the same starting point, they diverged from one another over time. Each amendment is coded as being either neutral, pro-worker or pro-employer. While this method of classification required a number of judgement calls, we found surprisingly few cases of uncertainty.<sup>8</sup> For the purposes of quantitative analysis, we coded each pro-worker amendment as a one, each neutral amendment as a zero, and each pro-employer amendment as a minus one.

It is useful to give a couple of examples of this procedure. A sample pro-employer reform is from Andhra Pradesh in 1987. Our synopsis is:

“If in the opinion of the state government it is necessary or expedient for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of an order and (ii) prohibits strikes and lockouts in connection with any industrial dispute.”

This amendment gets a code of minus one in our data. A sample pro-worker

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<sup>7</sup>The seven chapters cover: (I) definitions; (II) authorities under this Act; (III) reference of disputes to Boards, Courts or Tribunals; (IV) procedures, powers and duties of authorities; (V) strikes and lockouts, lay-off and retrenchment, unfair labour practices; (VI) penalties and (VII) miscellaneous [see Malik, 1997].

<sup>8</sup>In each case, we based this on two independent assessments. Summaries of all amendments and their coding is available at <http://econ.lse.ac.uk/staff/rburgess/wp>.

reform is from West Bengal in 1980 where our synopsis is:

“The limit of 45 days for workers receiving 50% of their wages upon being laid off (if they worked for more than a year) is removed.”

This gets coded as one in our data. Having obtained the direction of amendments in any given year, we cumulated the scores over time to give a quantitative picture of how the regulatory environment evolved over time. This is our basic regulatory measure used below.<sup>9</sup>

This method classifies states as either “treatment” or “control” states. The latter are states that do not experience any amendment activity in a pro-worker or pro-employer direction over the 1958-1992 period. There are six of these: Assam, Bihar, Haryana, Jammu and Kashmir, Punjab and Uttar Pradesh. Among those that have passed amendments, our method classifies six states Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Rajasthan and Tamil Nadu as “pro-employer”. This leaves four “pro-worker” states: Gujarat, Maharashtra, Orissa and West Bengal. Figure 2 graphs the history of regulatory change across states over the period in question. For the most part, changes are monotonic although some states do move in different directions. We have both pro-worker and pro-employer states among the fast growers.

Pro-worker states on average had high per capita registered manufacturing output in 1960 relative to control states and pro-employer states. However by 1990, there is no statistically significant difference between pro-worker and pro-employer states. Moreover, registered manufacturing output in the pro-employer states has overtaken that in the control states. This pattern is less pronounced when looking at overall output per capita. Other state characteristics such as total taxes per capita, development expenditure per capita, installed electricity per capita and literacy show no significant difference between treatment and control states.

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<sup>9</sup>In years in which there were multiple amendments, we use an indicator of the general direction of change. So, for example, if there were four pro-worker amendments in a given state and year, we would only code this as plus one rather than plus four. Coding in this manner gives us a total of nineteen changes in our period (see Figure 2). In an Appendix Table we describe the individual state level amendments which lie behind each of these changes. These take a variety of forms covering limits on the ability to strike, changing the rules relating to layoff, retrenchment and closure and giving workers or employers greater power in the procedures for resolving industrial disputes.

Before considering the impact of labor regulation on economic outcomes, we show that the regulation measure is related to the industrial relations climate in a state as measured by work days lost to strikes and lockouts in the registered manufacturing sector.<sup>10</sup> This may be a key signal to potential investors. Table 2 shows that labor regulation is strongly positively correlated with work days lost to strikes and lockouts per worker.<sup>11</sup> Columns (2) and (4) show this finding to be robust to including state specific time trends. Thus, regulating in a pro-worker direction appears to be associated with greater disruption of production. This validates our measure as a representation of the industrial relations climate.

## II.B Theoretical Considerations

The defining difference between registered and unregistered firms is scale, with labor regulations affecting only registered firms. It is reasonable to suppose that all firms operate in a common set of factor markets whose prices they treat as parametric. For simplicity, suppose that firms all produce a common manufactured good. There are then two main routes via which labor regulation affects economic performance – a *relative price effect* and an *expropriation effect*. While intellectually distinct, they have similar implications for what we expect to find in the data.

The relative price effect is relevant if the effect of labor regulation is to raise the (fixed or marginal) cost of employing laborers. Labor regulation will typically create adjustment costs in hiring and firing labor and in making adjustments in the organization of production. We would expect firms in the registered sector to substitute away from labor (reducing employment) towards other labor saving inputs (including capital if labor and capital are substitutes). Regulation also lowers the firm’s optimal output level since it

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<sup>10</sup>Strikes and lockouts are both important sources of lost working time. There are twice as many work days lost to strikes than to lockouts. There is pronounced variation across states and time – West Bengal, for example, loses twenty five times as many work days to strikes per capita relative to Assam.

<sup>11</sup>We run panel data regressions of the form:

$$y_{st} = \alpha_s + \beta_t + \mu r_{st-1} + \varepsilon_{st}$$

where  $y_{st}$  is work days lost to strikes and lockouts per worker in the registered manufacturing sector,  $r_{st}$  is the regulatory measure,  $\alpha_s$  is a state fixed effect and  $\beta_t$  is a year effect. We cluster our standard errors by state to deal with concerns about serial correlation.

raises the marginal cost of production. We would also expect regulation to affect the decision to register. In states where regulations raise labor costs, firms will (other things being equal) resist becoming registered by remaining small. Thus, we would expect to find fewer registered firms along with a higher level of production in the unregistered sector in states that legislate in a pro-worker direction.

The expropriation effect refers to the dynamic implications of labor regulation. By increasing the bargaining power of workers, labor regulation can increase the importance of hold-up problems in investment.<sup>12</sup> Suppose that firm's invest in anticipation of earning a particular return may face a problem if workers can expropriate part of that return once the capital is sunk. This will serve to discourage investment, even if labor and capital are substitutes. This has similar predictions in terms of output, employment, output and the decision to register as the relative price effect. However, it strengthens the presumption that capital stocks will also be lower. This effect shows why pro-worker labor regulation is similar to insecure property rights for owners of capital as their sunk investments are subject to worker expropriation.

Whether workers benefit from labor regulation is not clear cut. If labor costs rise because firms put in more worker friendly work practices, then it will depend on how these are paid for in terms of lower wages or lower employment. There may also be differential effects on insiders and outsiders. If there is a hold-up problem, then workers should realize that if they have too much bargaining power, they will reduce investment to their own detriment (especially if labor and capital are complements). Whether wages rise or fall is also not clear-cut.

### III. METHOD AND RESULTS

Our econometric analysis is based on panel data regressions of the form:

$$y_{st} = \alpha_s + \beta_t + \mu r_{st-1} + \xi x_{st} + \varepsilon_{st}$$

where  $y_{st}$  is a (logged) outcome variable in state  $s$  at time  $t$ ,  $r_{st}$  is the regulatory measure (which we lag one period to capture the gap between enactment

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<sup>12</sup>Grout [1984] developed one of the first models along these lines. Caballero and Hamour [1998] draw out macro-economic implications.

and implementation)<sup>13</sup>,  $x_{st}$  are other exogenous variables,  $\alpha_s$  is a state fixed effect and  $\beta_t$  is a year fixed effect. We cluster our standard errors by state to deal with concerns with serial correlation (Bertrand, Duflo and Mullainathan, [2002]).<sup>14</sup>

The state fixed effect captures state-specific factors such as culture and geography. The year effects capture common shocks such as central government amendments to the Industrial Disputes Act which took place in 1976 and 1982 (see Fallon [1987] and Fallon and Lucas [1993]) as well as other centrally implemented policies.

### III.A *Basic Results*

Table 3 looks at measures of output per capita and their link to labor regulation. The left hand side variable in column (1) is total state output per capita which does not appear to be correlated with the labor regulation regime. This is reasonable since labor regulation is sector specific and registered manufacturing represents a fairly small part of the Indian economy. Above all, this suggests that labor regulation is not simply a proxy for generally poor government policy. Column (2) looks at agricultural output. A negative effect here would also suggest that our labor regulation is really proxying for other policies. In fact, there is a weak positive effect suggesting that discouraging manufacturing may encourage agricultural production. In contrast, non-agricultural output – which includes manufacturing – is negatively correlated with labor regulation (column (3)). Column (4) shows that there no effect on output in the construction sector, another sector where labor regulation is not applied.<sup>15</sup>

Turning to manufacturing, column (5) shows that the point estimate becomes larger and more significant when focusing on total manufacturing output. Breaking this into registered and unregistered sectors as in columns (6) and (7) of Table 3 provides further confirmation that the effect at work is specific to registered manufacturing. There is now a larger and more significant negative effect on registered manufacturing in column (6). Moreover, for unregistered manufacturing in column (7), we get the opposite sign –

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<sup>13</sup>Our results are robust to imposing different lags. Our readings of the literature suggests that amendments come into force roughly one year after they are passed.

<sup>14</sup>We conducted some stationarity tests for panel data of the kind suggested by Madalla and Wu [1999]. These suggested no difficulty in assuming stationarity.

<sup>15</sup>Over our period construction accounts for 5 percent of total state output and 10 percent of non-agricultural output.

high levels of pro-worker labor regulation have a positive impact on output in this sector.<sup>16</sup> Thus labor regulation seems to deter formal registration, encouraging firms to remain in the informal sector.

These results make sense. Labor regulation is affecting only that sector where we should expect to see an effect. Since labor regulations are the main regulatory instrument in registered manufacturing under state control, this finding is compelling. Our next tasks are to check the robustness of these findings to a number of other specifications and to expand the set of registered manufacturing performance measures beyond just output.

Table 4 assesses the robustness of the finding that registered manufacturing responds negatively to pro-worker labor regulation. Column (1) replicates the basic result from Table 3. In column (2) we add a number of controls. These are the log of real development expenditure per capita which includes spending on health, education, infrastructure and administration. This helps crudely to measure differences in human capital and infrastructure due to government activities. We also include the log of installed electrical capacity per capita, measured in kilowatts, to capture the capacity of states to generate electricity. It may also be a reasonable proxy for the general state of infrastructure and is positively associated with registered manufacturing output. Finally, the log of the state population is also included as a crude measure of changing labor market conditions within a state. Column (2) shows that the coefficient on labor regulation remains negative and significant when we include these controls.

While these results help to deal with the concern that labor regulation is a proxy for other state level policies, it is possible that some aspects of the policy environment are difficult to measure. As a further robustness check, we therefore add in controls for the political complexion of states on the grounds that policies towards the registered manufacturing sector are likely to be correlated with political outcomes. To this end, we assemble a picture of each state's "political history" as measured by the number of years during our data period that particular political groupings have held a majority of the seats in the state legislature. The relevant groupings for this exercise are: the Congress party, the Janata parties, hard left parties and regional parties. The results are in column (3). They show that greater hard left control of the state legislature depresses growth in registered manufacturing. The

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<sup>16</sup>The idea that firms migrate to the informal sector to escape regulation is widespread – see, for example, Schneider and Enste [2000].

coefficient on labor regulation does, however, remain negative and significant, even though it is smaller in absolute size. The result is consistent with notion that there are anti-business policies which hard left governments introduce. Nonetheless, the effect of labor regulation remains.

In column (4), we add state specific time trends. In this case, the identification of the effects of labor regulations comes from whether such law changes lead to deviations from pre-existing state specific trends. The effect of labor regulation is no longer apparent. Thus, states with similar patterns of labor regulation also have similar long-term trends. Labor regulation appears therefore to be driving differences in these trends. But this does raise the issue of whether it is possible to separate out effects of labor regulations *per se* from impacts due to the climate of labor relations such as union power and labor/management hostility which manifest themselves in the trend growth rate. We return to this issue below.

Column (5) addresses the sensitivity of the results to the inclusion of West Bengal. This state is an important case for our analysis since it passed the largest number of pro-worker amendments and has had a declining manufacturing base. However, as column (5) shows, the results hold up even if we exclude it from the regression.<sup>17</sup> In column (6) we show that the result on unregistered manufacturing is robust to including our control variables and excluding West Bengal.

Table 5 looks at the effect for a variety of other performance measures in registered manufacturing. We report this for a specification that includes the full set of controls. In columns (1) and (2), we look at two measures of manufacturing employment. The first, reported in column (1) is the log of total employees taken from the Annual Survey of Industries. This covers both production workers and those in supervisory or managerial positions. We find states with more pro-worker legislation have lower levels of employment in registered manufacturing. This parallels our findings for output.<sup>18</sup> Column (2) examines daily employment defined as total worker attendances over a year divided by the total number of days worked by the factory. This measure which, captures the intensity of labor usage, is based

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<sup>17</sup>We carried out further checks by excluding each of the states and in all cases the coefficient on labor regulation remained negative and significant.

<sup>18</sup>It is also consistent with Fallon [1987] and Fallon and Lucas [1993] who found that strengthening job security regulations via the 1976 and 1982 central government amendments to the Industrial Disputes Act was associated with a reduction in labor demand in firms covered by the regulation but not in small firms uncovered by job security regulations.

on returns submitted by registered manufacturing firms and comes from a separate data source, the Indian Labor Yearbook.<sup>19</sup> Here again we find a negative and significant impact of labor regulation. Comparing columns (1) and (2) suggests that there is greater adjustment in the intensity of labor usage as opposed to in aggregate employment levels which may be connected to constraints on firing workers and closing down firms [Fallon and Lucas, 1993].

Column (3) of Table 5 considers how earnings per worker are affected by labor regulation. The measure is obtained by dividing the total factory wage bill (which includes all monetary payments to workers) by the number of workers. We find that there is no significant effect of regulation on payments to workers.<sup>20</sup> This lines up with the fact that theory does not give any clear-cut predictions for wages. The bottom line is that workers do not appear to be gaining from pro-worker amendments.

In column (4) of Table 5, we examine fixed capital formation. Labor regulations that increase worker bargaining power are likely to reduce capital formation. The coefficient on labor regulation is consistent with this story. Column (5) shows that the number of registered manufacturing factories is negatively related to pro-worker labor regulation.<sup>21</sup> Column (6) looks at firm firm efficiency in the form of value added per employee. Value added in firms is lower in which there is more labor regulation. This is consistent with an expropriation effect whereby blunting investment incentives leads to labor regulations being associated with lower productivity in the registered manufacturing sector.<sup>22</sup>

To gauge the economic significance of these findings we look at two extreme cases: Andhra Pradesh as a pro-employer state and West Bengal as a pro-worker state. The coefficients from the basic specifications in Tables 4 and 5 imply that without their pro-employer reforms, Andhra Pradesh would

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<sup>19</sup>As they are based on submissions these figures are likely to be less reliable those based on the Annual Survey of Industries. They nonetheless serve as a useful robustness check.

<sup>20</sup>In an earlier version of the, we found that is also true for a number of different measures of earnings drawn from both the Annual Survey of Industries and the Indian Labor Yearbook [see Besley and Burgess, 2002].

<sup>21</sup>This variable captures the net flow of firms in the registered manufacturing sector. It shows that the number of firms is significantly lower in states with more pro-worker regulation, suggesting that pro-worker regulation is either acting as a deterrent to new firms or to firms dying at a faster rate.

<sup>22</sup>The results in Table 5 are robust to excluding West Bengal. However, in common with the output results, they are not robust to including state specific time trends.

have registering manufacturing output which was 72 percent of its actual 1990 level and manufacturing employment that was 73 percent of its 1990 level. Had West Bengal not passed any pro-worker amendments it would have enjoyed a registered manufacturing output that was 24 percent higher than its 1990 level and employment that was 23 percent higher.<sup>23</sup> Thus, the implied economic magnitudes are sizeable.

Collectively these results paint a consistent picture.<sup>24</sup> Across the board, our labor regulation measure is correlated with poor economic performance in the registered manufacturing sector. It also leads to a larger informal sector.

### III.B *Endogeneity*

A remaining concern is that states with larger vested interests in manufacturing at the beginning of the period may have experienced greater pressure to pass pro-worker amendments and may, as a consequence, have experienced

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<sup>23</sup>Though inclusion of the full set of political and economic controls does reduce the magnitudes of these effects they remain economically important.

<sup>24</sup>As a further control for omitted variables, we have collected information on the efficiency of state high courts in India as measured by annual pendency rates. The pendency rate is constructed by adding the number of cases pending at the beginning of the year to cases filed in the year and dividing this by cases resolved during the year. This measure, which is available only for a shorter time period, 1971 - 1996, may be a determinant of the property rights regime in force in the state. In contrast with our labor regulation variable, it has a significantly *negative* impact on log agricultural output per capita (the coefficient is -0.105 with a robust t-statistic, adjusted for clustering on state, of 2.57). It also has significant and negative association with non-agricultural output as a whole. Within manufacturing it is negatively correlated with the log of unregistered manufacturing output per capita (the coefficient is -0.458 with a robust t-statistic, adjusted for clustering on state, of 1.69) – the opposite sign from labor regulation variable (the coefficient is 0.098 with a robust t-statistic, adjusted for clustering on state, of 2.35) Thus, court inefficiency is correlated with lower informal sector manufacturing. Unlike labor regulation his efficiency measure is not significantly negatively correlated with the log of output per capita in registered manufacturing. The picture that emerges therefore is one where court efficiency adversely affects economic activity in a wide range of sectors, in particular in the large informal sectors where problems of property rights and law and contract enforcement may be acute. In contrast, labor regulations only negatively affect the sector to which they apply and, in contrast, encourage economic activity in unregistered manufacturing and agriculture. These results help to increase our confidence that our amendments measure is picking up the impact of labor regulation as opposed to of other anti-business policies. The question of how courts work in India and affect economic performance is an important issue for further research.

slower growth. Indeed, theoretical arguments along these lines have been developed in the political economy of development literature. For example Krusell and Rios-Rull (1996) model the idea that political insiders can see development as a threat to their rents and hence lobby for protection. In an Indian context, workers would lobby for stricter labor regulation as a means of extracting a greater share of the surplus from existing investments even though this may deter future investment. Thus, the negative correlation between output and performance is consistent with reverse causation. We now develop two ways of addressing this concern empirically.

As our measure of the extent of vested interests, we take the average level of union membership (union members divided by population) before 1977.<sup>25</sup> We first use these data to match states that experience labor market reforms (pro-worker or pro-employer) with control states based on the level of unionization.<sup>26</sup> We then regress labor regulation on the difference between registered manufacturing in a ‘treatment’ state and that in its matched ‘control’ state while also including match dummies in the regression.

The results are in columns (1) - (3) of Table 6. They confirm the effects on registered and unregistered manufacturing output per capita and employment in registered manufacturing per capita that we have found throughout. They add credibility to the findings since they guard against the concern that there is something in the initial condition, rather than the subsequent policy experience, which is driving subsequent performance.

An extension of this idea can also yield an instrumental variable for labor regulation. Looking at Figure 2, it is striking that most of the labor regulation changes take place after 1977. This is no-coincidence. Following Prime Minister Indira Gandhi’s declaration of a state of emergency (suspending democratic institutions), the political power of her party (Congress) was significantly and permanently diminished.<sup>27</sup> There were a number of switches in political control with Congress losing its majority in half of our states

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<sup>25</sup> The data on union membership are patchy. For example there are no usable data for Jammu and Kashmir. Moreover, there are often gaps in the series. We choose the pre-1977 average to get a better sense of the level of unionization.

<sup>26</sup>See the Data Appendix for details on state matches. We also matched based on initial registered manufacturing output per capita, obtaining similar results.

<sup>27</sup>Declaration of a state of emergency was a response to calls for her resignation after she was found guilty of using illegal practices during the prior election campaign. Between 1975, when emergency was declared, and 1978, when fresh elections were called, the share of congress votes in state assemblies dropped from 60% to 38%.

between 1975 and 1978. The most notable example was the left front which gained a majority in West Bengal in 1977 and has remained the majority coalition ever since. The 1947 Industrial Disputes Act represented a piece of Congress legislation which was largely kept intact pre-1977 by Congress dominated state governments. Post-1977 state deviations are likely in part to be a result of changes in political control. And the direction that post-1977 amendments took would depend, in part, on the importance of the initial vested interests (as proxied by union membership). This suggests that the union membership variable interacted with a dummy which equals one after 1977 may pick up the time path of labor regulation.

In addition to union membership, we also use historical patterns of land tenure to develop a further instrument.<sup>28</sup> The main difference is between those areas in India where land revenue was collected through landlords or not. Banerjee and Iyer (2002) show that these measures have an impact on contemporary patterns of development, particularly agricultural productivity and public good provision. Our motivation for using this variable is the possibility that it is correlated with contemporary patterns of political development. In confirmation of this, we find that areas dominated by non-landlord based revenue collection have larger concentrations of regional parties today, i.e. those that do not have a large role in other states or in the national legislature. In many cases, these parties were the main competitor to the Congress party and hence benefitted politically from the state of emergency. Hence, our instrument interacts the fraction of districts in each state that had non-landlord based revenue collection systems with a dummy variable which equals one after 1977 to mark the persistent shift in political control after the state of emergency.

Column (7) of Table 6 confirms that both of our instruments are correlated with labor regulation (F-statistic=7.46). The union variable is positively correlated with labor regulation while the variable based on the proportion of districts under the non-landlord based agricultural tax system is negatively correlated with labor regulation.<sup>29</sup> In columns (4), (5) and (6), we report two-stage least squares estimates of the effect of labor regulation

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<sup>28</sup>We are grateful to Abhijit Banerjee and Lakshmi Iyer for providing this data. For each modern state, the variable that we use is the mean number of constituent districts in British India which had non-landlord based land revenue systems. Its construction is described in detail in the Data Appendix.

<sup>29</sup>As we discussed above, the second of these is explained by the correlation between this variable and regional party development.

on output and employment using these two variables as instruments. Our results are robust to this instrumentation. Moreover, the Sargan test of over-identification passes comfortably.<sup>30</sup>

The effects in the instrumental variables case are uniformly larger in absolute size. This suggests that, if anything biases could be due to high levels of economic performance generating demand for protecting workers.<sup>31</sup> Overall, these results increase our confidence that poor performance in registered manufacturing was a consequence rather than a cause of labor regulations.

### III.C *Disaggregated Evidence*

The evidence presented so far aggregates all registered manufacturing industries together. But Indian states have quite different manufacturing bases. Hence, there might be a suspicion that patterns of specialization affect the direction of regulation in ways that could bias our results. For example, early industrializing states might specialize in slow growing labor intensive industries which spawn stronger vested interests, thereby inducing a negative correlation between pro-worker regulations and manufacturing performance.

In response to such concerns, we present results on disaggregated data which look at the impact of labor regulation at the 3-digit industry level for the period 1980-97.<sup>32</sup> In line with the analysis above, we investigate the link between performance and labor regulation by running panel regressions of the form:

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<sup>30</sup>The results are not robust to including state specific time trends. Thus we cannot rule out the possibility that the *trends* in manufacturing output prior to our data period were important in the subsequent pattern of manufacturing development.

<sup>31</sup>This is consistent with our efforts to investigate whether changes in labor regulations were timed around deviations in manufacturing output changes from their trend. We constructed a measure of “recessions” classified as periods in which output growth falls below trend for two consecutive years. No clear pattern emerged. Recessions actually accompanied pro-firm regulatory changes in five of our eighteen reforms (Andhra Pradesh in 1968, Karnataka in 1988, Madhya Pradesh in 1982, Rajasthan in 1970 and Tamil Nadu in 1982). By contrast, it accompanied pro-worker changes in only three cases (Maharashtra in 1974, Orissa in 1983 and West Bengal in 1974).

<sup>32</sup>The data form an unbalanced panel. Our analysis retains state industries which remain in the panel for at least ten years and within these industries we restrict our attention to firms which employ more than a hundred workers to get around the problem of smaller firms being excluded from the sample to maintain confidentiality. Using this a definition we have total of 101 3-digit industries in our panel with an average of 68 in each state. The results we obtain are robust to using a balanced panel (i.e. only retaining state 3-digit industries which remain in the panel over the whole 1980-1997 period).

$$y_{ist} = \alpha_{is} + \beta_t + \delta_i t + \mu r_{st-1} + \varepsilon_{ist}$$

where  $y_{ist}$  is a (logged) 3-digit industry outcome variable,  $r_{st-1}$  is the labor regulation measure measured at the state level and lagged one period,  $\alpha_{is}$  is a state-industry fixed effect,  $\beta_t$  is a year effect,  $\delta_i$  is a dummy variable which is equal to one for industry  $i$  and  $t$  is a time trend. We cluster our standard errors by state-industry grouping to deal with concerns about serial correlation. Inclusion of the state-industry fixed effect allows us to control for unobserved, time-invariant factors which affect performance at the state 3-digit industry level. Thus, identification is now coming from within state-industry variation. The inclusion of 3-digit industry time trends in the regressions also helps to control for the possibility that industries experience different rates of technological change.

Column (1) in Table 7 confirms the basic result above showing that regulating in a pro-worker direction has a significant and negative impact on registered manufacturing output. Column (2) shows that the results for employment also mirror those for state level analysis – employment growth within 3-digit industries is lower in states which regulated in a pro-worker direction. Column (3) confirms our result on fixed capital – investment in fixed capital is lower in pro-worker versus pro-employer states. Moreover, the magnitude of the coefficients we observe in columns (1) – (3) of Table 7 is similar to those in Tables 4, 5 and 6. Column (4), which looks at the number of registered firms in a three digit industry, lines up with the investment effect in column (3) by suggesting that there is greater entry/lower exit in states that regulate in a pro-employer direction. Column (5) shows that regulating in a pro-worker direction is correlated with lower productivity at the 3-digit industry level as measured by value-added per employee.<sup>33</sup>

While available only for a shorter time period, these results are very similar to those found for the aggregate data for the period 1958-92. They allay any fears that our results are an artefact of patterns of specialization or technological change in registered manufacturing across Indian states.

#### IV. WELFARE CONSEQUENCES

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<sup>33</sup>Although we are allowing for industry specific time trends, the results do not hold up with state specific trends.

We turn finally to the effect of labor regulation on poverty. This is important for a number of reasons, not least because it may give a sense of where the burden of the effects identified in the last section have been felt. To assess this, we use poverty data from Ozler, Datt and Ravallion [1996]. We focus on urban and rural headcounts which measure the percentage of the population below the Indian urban and rural poverty lines. The econometric specification we use is the same as for manufacturing performance.

We expect the direct effect on poverty to depend on the extent to which the earnings of the poor are derived from registered manufacturing. While we have no direct quantitative estimate of this, it is instructive to consider the correlation between poverty rates and different components of state output in India. To do so, we disaggregated state output into agricultural, registered manufacturing, unregistered manufacturing and “other” (non-agricultural/non-manufacturing).<sup>34</sup> We find that for urban poverty, the largest coefficient is on registered manufacturing and “other”.<sup>35</sup> Agricultural output and unregistered manufacturing are not significantly correlated with urban poverty. For rural poverty, there is a significant negative correlation between unregistered manufacturing and poverty and no significant correlation with registered manufacturing. These findings square with the fact that registered manufacturing firms are located mainly in urban areas whereas unregistered manufacturing firms are located in both rural and urban areas.

Given this pattern of correlations, our presumption is that pro-worker regulation is positively correlated with poverty in urban areas – with an effect operating through lowered registered manufacturing output and employment. There is no reason to expect a correlation with rural poverty. Table 8 shows that this is indeed the case. In column (1) we see that labor regulation has no effect on overall poverty. This lines up with our result for overall output. Regulating in a pro-worker direction is, however, associated with higher urban poverty (columns (2)). In column (3) we see that, in line with our expectations, there is no significant effect on rural poverty. This

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<sup>34</sup>Specifically, we run

$$p_{st} = \alpha_s + \beta_t + \gamma y_{st} + \varepsilon_{st}$$

where  $y_{st}$  is a vector of disaggregated income measures and  $p_{st}$  is a poverty headcount measure.

<sup>35</sup>We cannot reject the hypothesis that the coefficients on these two output sources are equal.

is consistent with the majority of registered manufacturing firms being in urban locations. In column (4) we find that the results hold up when we add economic controls to our basic specification from column (2). The labor regulation variable continues to exert a significant positive influence on the urban headcount. It is interesting to note that Congress control and hard left control are associated with higher levels of urban poverty.

Column (5) adds state specific time trends. Once again, this wipes out the effect of labor regulation. This underlines the need to exercise caution in attributing the effects observed in columns (2) and (4) to labor regulations as opposed to interactions of underlying differences in the industrial relations climate with regulations.

In column (6) we see that the effects remain when we run the regression only for years when NSS surveys were carried out. This shows that the result in column (6) is not sensitive to interpolating poverty statistics between years. In column (7) we exclude West Bengal from the regression and continue to observe a positive and significant link between pro-worker labor regulation and urban poverty. The coefficient on labor regulation in urban headcount regressions remains highly stable across the full range of specifications (barring column (5)) in Table 8.<sup>36</sup>

The economic significance of these effects can be gauged by examining what urban poverty would have been in 1990 had states not passed pro-worker or pro-employer amendments using the coefficient from column (2) in Table 8. Our empirical model predicts that, without their pro-employer reforms, then Andhra Pradesh would have urban poverty that was 112 percent of its 1990 level. Similarly, had West Bengal not passed any pro-worker amendments it would have had urban poverty that was 11 percent lower in 1990. This comparison starkly brings out how the direction of regulatory change matters. According to our estimates, there would have been around 640 thousand more urban poor in Andhra Pradesh in 1990 and around 520 thousand less urban

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<sup>36</sup>To check whether the coefficients in Table 8 are consistent with the entire effect on poverty reduction coming through the effect on registered manufacturing output, we regressed urban poverty on registered manufacturing. This yields a coefficient of -3.4. The size of the effect implied in Table 3 is 0.8 compared to a coefficient in Table 8 of 2.3. However, despite the apparently larger reduced form effect, these two estimates do lie within the 95% confidence interval for the compound effect of labor regulation. Nonetheless, the results are suggestive of the possibility of a direct effect of labor regulation on poverty beyond the effect operating through falls in registered manufacturing output. For example, regulations could make it easier for non-poor insiders to exclude poor outsiders from access to jobs in the registered sector.

poor in West Bengal had these states not amended the Industrial Disputes Act.<sup>37</sup>

These welfare results are striking. The battle cry of labor market regulation is often that pro-worker labor market policies redress the unfavorable balance of power between capital and labor, leading to a progressive effect on income distribution. We find no evidence of this here – indeed the distributional effects appear to have worked against the poor.

## V. CONCLUSIONS

This paper has examined the link between regulation and long-run development. The evidence amassed in the paper points to the direction of labor regulation as a key factor in the pattern of manufacturing development in India. Regulating in a pro-worker direction was associated with lower levels of investment, employment, productivity and output in registered manufacturing. It also increased informal sector activity.

The results leave little doubt that regulation of labor disputes in India has had quantitatively significant effects. In India, the hand of government has been at least as important as the invisible hand in determining resource allocation. This has provoked heated debate about which aspects of this role have constituted a brake on development. It is apparent that much of the reasoning behind labor regulation was wrong-headed and led to outcomes that were antithetical to their original objectives.

The paper finds little evidence that pro-worker labor market regulations have actually promoted the interests of labor and, more worryingly, that they have been a constraint on growth and poverty alleviation. Our results have not been able thus far to find any gainers except for the extent to which there may have been capital and labor flows across Indian states in response to policy disparities as they have developed. Our finding that regulating in a pro-worker direction was associated with increases in urban poverty are particularly striking as they suggest that attempts to redress the balance of power between capital and labor can end up hurting the poor.

The fact that our results are not robust to state specific time trends does raise the question of whether the effects that we are picking up are those due to labor regulations *per se* or the consequences of a poor climate of

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<sup>37</sup>The urban population of Andhra Pradesh and West Bengal were 17.15 and 18.15 million respectively in 1990.

labor relations – union power and labor/management hostility – which affect the trend rate of growth within a state. This goes to interpretation of the finding. But either way, the analysis suggests that labor market institutions in India have had an important impact on manufacturing development.

The analysis reinforces the growing sentiment that government regulations in developing countries have not always promoted social welfare. The example that we have studied here is highly specific and it is clear that it cannot be used to promote a generalized pro- or anti-regulation stance. Future progress will likely rest on improving our knowledge of specific regulatory policies. Research involving particular country experiences will be an important component of this. Only then can the right balance between the helping and hindering hands of government be found.

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#### DATA APPENDIX

The data used in the paper come from a wide variety of sources.<sup>38</sup> They cover the sixteen main Indian states listed in Figure 1 and refer mainly to the period 1958-1992. Haryana split from the state of Punjab in 1965. After this date on, we include separate observations for Punjab and Haryana. Variables expressed in real terms are deflated using the **Consumer Price Index for Agricultural Laborers** (CPIAL) and **Consumer Price Index for Industrial Workers** (CPIIW). These are drawn from a number of Government of India publications which include Indian Labor Handbook, the Indian Labor Journal, the Indian Labor Gazette and the Reserve Bank of India Report on Currency and Finance. Ozler, Datt and Ravallion [1996] have further corrected CPIAL and CPIIW to take account of inter-state cost of living differentials and have also adjusted CPIAL to take account of rising firewood prices. The reference period for the deflator is October 1973- March 1974. State **population** data used to express magnitudes in per capita terms and as a control comes from the 1951, 1961, 1971, 1981 and 1991 censuses [Census of India, Registrar General and Census Commissioner, Government of India] and has been interpolated between census years. Separate series are available for urban and rural areas.

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<sup>38</sup>Our data sets builds on Ozler, Datt and Ravallion [1996] which collects published data on poverty, output, wages, price indices and population to construct a consistent panel data set on Indian states for the period 1958 to 1992. We are grateful to Martin Ravallion for providing us with this data and to Guarav Datt for answering various queries. To these data, we have added information on labor regulation, manufacturing performance, political representation, infrastructure and public finances of Indian states.

The **labor regulation** variable comes from state specific text amendments to the Industrial Disputes Act 1947 as reported in Malik [1997]. We decided to code each change in the following way: a 1 denotes a change that is pro-worker or anti-employer, a 0 denotes a change that we judged not to affect the bargaining power of either workers or employers and a  $-1$  denotes a change which we regard to be anti-worker or pro-employer. There were 113 state specific amendments coded in this manner. Where there was more than one amendment in a year we collapsed this information into a single directional measure. Thus reforms in the regulatory climate are restricted to taking a value of 1, 0,  $-1$  in any given state and year. To use these data, we then construct cumulated variables which map the entire history of each state beginning from 1947 – the date of enactment of the Industrial Disputes Act.

Data on **annual work days lost to strikes and lockouts** comes from various issues of the Indian Labor Yearbook, Labor Bureau, Ministry of Labor, Government of India. We divide this by number of workers employed from the Annual Survey of Industries data to get a per worker measure.

**State output** comes from Estimates of State Domestic Product published by Department of Statistics, Ministry of Planning, Government of India. Output variables are deflated and expressed in log per capita terms. The breakdown of total output into agricultural, non-agricultural and manufacturing output is done under the National Industrial Classification System (NIC) which conforms with the International Standard Industrial Classification System (ISIC). Within manufacturing – registered manufacturing is defined by the Factories Act of 1948 to refer to firms with ten or more employees with power or twenty or more employees without power. Unregistered manufacturing refers to firms below these cutoffs and the size of this sector is appraised by sample surveys carried out by the Department of Statistics.

Figures on **employees and workers** come from the Annual Survey of Industries, Central Statistical Office (Industrial Statistics Wing), Department of Statistics, Ministry of Planning and Programme Implementation, Government of India. Workers are defined as to include all persons employed directly or through any agency whether for wages or not and engaged in any manufacturing process or in any other kind of work incidental to or connected to the manufacturing process. Employees includes all workers and persons receiving wages and holding supervisory or managerial positions engaged in administrative office, store keeping section and welfare section, sales department as also those engaged in purchase of raw materials etc. or purchase of

fixed assets for the factory and watch and ward staff. **Daily employment** figures are from returns submitted from firms under the Factories Act of 1948 which have been analyzed and collated in the Indian Labor Yearbook, Labor Bureau, Ministry of Labor, Government of India. They are obtained by dividing total worker (defined as above) attendances in a year by the number of days worked by the factory.

**Earnings** are defined to include all remunerations capable of being expressed in monetary terms and also payable more or less regularly in each pay period to workers. It includes (a) direct wages and salary payments, (b) remuneration for period not worked, (c) bonuses and ex-gratia payments paid both at regular and at less frequent intervals. It excludes (a) lay off payments which are made from trust or other social funds set up expressly for this purpose, imputed value of the benefits in kind, (b) employer's contribution to the old age benefits and other social security charges, direct expenditure on maternity benefits and crèches and other group benefits, (c) travelling and other expenditure incurred for the business purpose, are re-imbrued by the employer are excluded. Earnings are expressed in terms of gross value i.e. before deduction for fines, damages, taxes, provident funds, employee's state insurance contribution etc. They come from the Annual Survey of Industries and are expressed in real per worker terms.

**Value-added** in the registered manufacturing sector is the increment to the value of goods and services that is contributed by the factory and is obtained by deducting the value of total inputs and depreciations from the value of output. The **number of factories** variable comes from the list maintained by the Chief Inspector of Factories in each state which is updated to take into account both deregistration of firms and new entrants. It thus captures the net flow of firms in the registered manufacturing sector. **Fixed capital** represents the depreciated value of fixed assets owned by the factory on the closing date of the accounting year. Fixed assets are those which have a normal productive life of more than one year. Fixed capital covers all types of assets new or used or own constructed, deployed for production, transportation, living or recreational activities, hospitals, schools etc for factory personnel. All these measures come from the Annual Survey of Industries.

Total **installed electrical capacity** of electrical generation plants is measured in thousand kilowatts and come from various issues of the Statistical Abstracts of India, Central Statistical Office, Department of Statistics, Ministry of Planning, Government of India. It is expressed in log per capita

terms. **Development expenditure** refers to state spending on economic services (agriculture, rural development, special area programs, irrigation and flood control, energy, industry and minerals, transport and communications, science, technology and environment) and social services (education, medical and public health, family welfare, water supply and sanitation, housing, urban development, labour and labour welfare, social security and welfare, nutrition and relief). The primary source is an annual publication, Public Finance Statistics (Ministry of Finance, Government of India). This information is also collated in the Reserve Bank of India's annual publication Report on Currency and Finance.

The data on **political histories** comes from Butler, Lahiri and Roy [1991]. This primary data is aggregated into four political groupings which are defined in the text and expressed as shares of the total number of seats in state legislatures. State political configurations are held constant between elections. Political history is measured by the number of years during our data period that particular political groupings have held a majority of the seats in the legislature. In our data period, the relevant groupings are: the Congress party, the Janata parties, hard left parties and regional parties. These groupings contain the following parties (i) Congress Party (Indian National Congress + Indian Congress Socialist + Indian National Congress Urs + Indian National Congress Organization), (ii) Janata parties (Lok Dal+Janata+Janata Dal), (iii) a hard left grouping (Communist Party of India + Communist Party of India Marxist), and a (iv) grouping made up of regional parties.

For our measure of **unionization** we use the number of union members in a state divided by the state population and averaged over the pre-1977 period. The source of this data is the Indian Labor Yearbook, Labor Bureau, Ministry of Labor, Government of India. For the matched estimation we rank states by this variable and then match treatment states to control states with the closest level of pre-1977 unionization. The treatment-control matches are as follows: Andhra Pradesh-Uttar Pradesh, Gujarat-Bihar, Karnataka-Haryana, Kerala-Bihar, Madhya Pradesh-Uttar Pradesh, Maharashtra-Assam, Orissa-Uttar Pradesh, Rajasthan-Uttar Pradesh, Tamil Nadu-Assam, West Bengal-Assam. For our historical **land tenure** measure we used data from Banerjee and Iyer [2002] who classified the land revenue system imposed in each district of British India as landlord or non-landlord based. To construct our state measure we took the mean value for constituent districts of modern states weighting each by land area of the district.

Our **disaggregated registered manufacturing data** come from the Annual Survey of Industries which reports information on production activity in the registered manufacturing sector across the sixteen main Indian states for more than 100 3-digit industries during 1980-97.

The **poverty** figures we use for the rural and urban areas of India's 16 major states, spanning 1957-58 to 1991-92 were put together by Ozler, Datt and Ravallion [1996]. These measures are based on 22 rounds of the National Sample Survey (NSS) which span this period. The NSS rounds are not evenly spaced: the average interval between the midpoints of the surveys ranges from 0.9 to 5.5 years. Surveys were carried out in the following years 1958, 1959, 1960, 1961, 1962, 1963, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1973, 1974, 1978, 1983, 1987, 1988, 1990, 1991, 1992. Because other data are typically available on a yearly basis weighted interpolation has been used to generate poverty measures for years where there was no NSS survey. The poverty lines used are those recommended by the Planning Commission [1993]. The headcount measures are estimated from the grouped distributions of per capita expenditure published by the NSS, using parameterized Lorenz curves using a methodology detailed in Datt and Ravallion [1992].

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Table 1: Descriptive Statistics: 1958 - 1992

	Mean	Standard deviation
Labor regulation	-0.148	0.925
Works days lost to strikes per worker	4.350	11.90
Works days lost to lockouts per worker	1.628	6.470
Log registered manufacturing output per capita	4.252	0.796
Log unregistered manufacturing output per capita	3.900	0.513
Log registered manufacturing employment	12.44	1.056
Log registered manufacturing fixed capital per capita	0.709	0.846
Log registered manufacturing value added per employee	-11.72	0.497
Urban poverty headcount (percent)	43.14	12.76
Rural poverty headcount (percent)	50.79	14.08
Log develop expenditure per capita	4.368	0.824
Log installed electricity capacity per capita	6.677	1.214
Log state population	10.31	0.727
Congress majority	12.95	7.767
Hard left majority	0.377	1.711
Janata majority	0.616	1.440
Regional majority	1.284	4.070

Notes: The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 2: Labor Regulation and Industrial Disputes in India: 1958-1992

	(1)	(2)	(3)	(4)
	Work days lost to strikes per worker	Work days lost to strikes per worker	Work days lost to lockouts per worker	Work days lost to lockouts per worker
Method	OLS	OLS	OLS	OLS
Labor regulation [t-1]	2.564** (2.55)	1.732* (1.87)	2.108** (2.32)	0.965*** (3.57)
State effects	YES	YES	YES	YES
Year effects	YES	YES	YES	YES
State time trends	NO	YES	NO	YES
Adjusted R <sup>2</sup>	0.08	0.07	0.14	0.15
Observations	547	547	514	514

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Data on work days lost to strikes and lockouts are expressed on an annual basis and we divide this by number of workers employed to get a per worker measure. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 3: Labor Regulation and Output in India: 1958-1992

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log state output per capita	Log state agricultural output per capita	Log state non- agricultural output per capita	Log state construction output per capita	Log total manufacturing output per capita	Log registered manufacturing output per capita	Log unregistered manufacturing output per capita
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Labor regulation [t-1]	-0.002 (0.14)	0.019* (1.81)	-0.034* (1.69)	-0.019 (0.29)	-0.073** (2.05)	-0.186*** (2.90)	0.086** (2.46)
State effects	YES	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.93	0.84	0.95	0.76	0.93	0.93	0.75
Observations	509	509	509	509	509	508	509

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Total, non-agricultural, agricultural, total manufacturing, registered manufacturing and unregistered manufacturing output figures are all components of state domestic product and are expressed in log real per capita terms. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 4: Labor Regulation and Manufacturing Performance in India: 1958-1992

	(1)	(2)	(3)	(4)	(5)	(6)
	Log registered manufacturing output per capita	Log unregistered manufacturing output per capita				
Method	OLS	OLS	OLS	OLS [state time trends]	OLS [no West Bengal]	OLS [no West Bengal]
Labor regulation [t-1]	-0.186*** (2.90)	-0.185*** (3.65)	-0.104*** (2.67)	0.0002 (0.01)	-0.105*** (2.59)	0.077** (2.25)
Log develop expenditure per capita		0.240* (1.88)	0.184 (1.55)	0.241** (2.28)	0.208 (1.69)*	0.492*** (3.39)
Log installed electricity capacity per capita		0.089 (1.47)	0.082 (1.51)	0.023 (0.69)	0.053 (1.21)	-0.070 (1.11)
Log state population		0.720 (0.75)	0.310 (0.26)	-1.419 (0.61)	0.629 (0.53)	-3.724*** (3.18)
Congress majority			-0.0009 (0.09)	0.020** (2.08)	-0.002 (0.27)	0.017 (0.95)
Hard left majority			-0.050*** (2.97)	-0.007 (0.77)	-0.073* (1.72)	0.154* (1.84)
Janata majority			0.008 (0.34)	-0.020 (0.60)	0.004 (0.15)	0.090** (2.20)
Regional majority			0.006 (0.70)	0.026 (1.11)	0.003 (0.32)	0.002 (0.18)
State effects	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
State time trends	NO	NO	NO	YES	NO	NO
Adjusted R <sup>2</sup>	0.93	0.93	0.94	0.95	0.94	0.80
Observations	508	491	491	491	459	459

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Registered and unregistered manufacturing output are in log real per capita terms. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Log of installed electrical capacity is measured in kilowatts and log development expenditure is real per capita state spending on social and economic services. Congress, hard left, Janata and regional majority are counts of the number of years for which these political groupings held a majority of the seats in the state legislatures. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 5: Labor Regulation and Employment, Investment and Productivity in Registered Manufacturing in India: 1958-1992

	(1)	(2)	(3)	(4)	(5)	(6)
	Log registered manufacturing employment	Log daily employment in registered manufacturing	Log earnings per worker in registered manufacturing	Log fixed capital per capita	Log number of factories per capita	Log value added per employee
Method	OLS	OLS	OLS	OLS	OLS	OLS
Labor regulation [t-1]	-0.072* (1.70)	-0.285*** (3.48)	0.008 (0.09)	-0.120** (2.49)	-0.234*** (3.44)	-0.127** (2.16)
Log develop expenditure per capita	0.076 (0.64)	0.327** (1.82)	0.207 (1.52)	0.594*** (2.93)	0.229 (1.50)	0.262** (2.09)
Log installed electricity capacity per capita	0.073 (1.34)	0.111 (1.51)	0.019 (0.34)	0.232* (1.82)	0.037 (0.95)	-0.034 (0.45)
Log state population	-0.099 (0.09)	2.122 (1.14)	1.116 (0.93)	-1.130 (0.61)	1.18 (0.42)	-1.19 (0.81)
Congress majority	0.008 (0.61)	-0.009 (0.39)	-0.037* (1.66)	0.008 (0.43)	-0.006 (0.36)	0.009 (0.73)
Hard left majority	-0.028 (1.43)	-0.124*** (3.93)	0.0004 (0.01)	0.001 (0.05)	-0.044* (1.81)	0.019 (0.90)
Janata Majority	0.050* (1.67)	-0.024 (0.59)	-0.002 (0.04)	0.001 (0.04)	0.028 (0.66)	-0.003 (0.10)
Regional majority	0.007 (0.31)	0.018 (0.69)	-0.003 (0.34)	0.0002 (0.02)	-0.032 (1.49)	-0.0001 (0.02)
State effects	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.98	0.91	0.75	0.80	0.90	0.64
Observations	516	459	513	515	460	435

Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Registered manufacturing employment refers to total employment in factories and daily employment is defined as total worker attendances over a year divided by the total number of days worked by the factory. Earnings per worker is obtained by dividing total annual remuneration by the number of workers. Fixed capital represents the depreciated value of fixed assets owned by the factory on the closing date of the accounting year. The number of factories refers to the number in the registered manufacturing sector in each state where adjustments are made for deregistration and new entrants. Value-added per employee is obtained by deducting the value of total inputs and depreciations from the value of output and dividing this by the number of employees in a factory. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Installed electrical capacity is measured in kilowatts and development expenditure is real per capita state spending on social and economic services. Congress, hard left, Janata and regional majority are counts of the number of years for which these political groupings held a majority of the seats in the state legislatures. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 6 Labor Regulation and Industrial Performance : Dealing with Endogeneity Concerns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log registered manufacturing output difference	Log unregistered manufacturing output difference	Log registered manufacturing employment difference	Log registered manufacturing output	Log unregistered manufacturing output	Log registered man employ	Labor regulation
Method	OLS on matched differences	OLS on matched differences	OLS on matched differences	2SLS	2SLS	2SLS	OLS
Labor regulation difference	-0.132*** (5.50)	0.310*** (8.20)	-0.064** (2.30)				
Labor regulation [t-1]				-0.399*** (4.02)	0.117* (1.80)	-0.370*** (3.50)	
Mean unionization *post 1977 dummy							0.095*** (3.52)
Mean non-landlord*post 1977 dummy							-1.422** (2.48)
Match dummies	YES	YES	YES	NO	NO	NO	NO
State effects	NO	NO	NO	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES	YES
Over-identification test p- value				0.98	0.99	0.78	
F-test instruments(Prob>F)							7.46 (0.006)
Adjusted R <sup>2</sup>	0.84	0.77	0.96	0.88	0.79	0.90	0.79
Observations	283	283	300	480	480	517	525

Notes: Absolute t statistics calculated using robust standard errors are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. For columns (1) - (3) we use the average level of union membership (union members divided by population) before 1977 and use these data to match states that experience labor market reforms (pro-worker or pro-employer) with control states based on the level of unionization. We then regress labor regulation on the difference between registered manufacturing in a 'treatment' state and that in its matched 'control' state while also including match dummies in the regression. Standard errors in columns (4) – (6) are clustered at the state level. The two instruments for our lagged [t-1] labor regulation measure are: (i) the pre-1977 unionization measure interacted with a post-1997 dummy and (ii) the proportion of constituent districts of modern states which operated non-landlord land revenue systems in British India interacted with a post-1977 dummy. The overidentification test we employ is due to Sargan [1958]. The number of observations times the R<sup>2</sup> from the regression of the stage two residuals on the instruments is distributed  $\chi^2(T+1)$  where T is the number of instruments. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Installed electrical capacity is measured in kilowatts and log development expenditure is real per capita state spending on social and economic services. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Table 7 Labor Regulation and Industrial Performance in India: Industry Level Analysis 1980-1997

	(1)	(2)	(3)	(4)	(5)
	Log registered manufacturing output	Log registered manufacturing employment	Log registered fixed capital	Log number factories	Log value added per employee
Method	OLS	OLS	OLS	OLS	OLS
Labor regulation [t-1]	-0.087*** (3.68)	-0.060*** (3.19)	-0.063* (1.86)	-0.041*** (2.86)	-0.026** (2.07)
State * industry effects	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES
Industry time trends	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.90	0.90	0.81	0.92	0.74
Observations	21323	21323	20539	21206	21254

Notes: Absolute t statistics calculated using robust standard errors clustered at the state-industry level are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. The data used in the regressions is a panel data set on 3-digit registered manufacturing industries across the sixteen main states of India for the period 1980-1997. The data form an unbalanced panel. Our analysis retains state industries which remain in the panel for at least ten years and within these industries we restrict our attention to firms which employ more than a hundred workers to get around the problem of smaller firms being excluded from the sample to maintain confidentiality. Using this a definition we have total of 101 3-digit industries in our panel with an average of 68 in each state. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. The regressions include 3-digit industry time trends to help control for the possibility that industries experience different rates of technological change. See the Data Appendix for details on the construction and sources of the variables.

Table 8 Labor Regulation and Poverty in India: 1958-1992

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Overall headcount	Urban headcount	Rural headcount	Urban headcount	Urban headcount	Urban headcount	Urban headcount
Method	OLS	OLS	OLS	OLS	OLS [state time trends]	OLS [survey years only]	OLS [no West Bengal]
Labor regulation[t-1]	-0.008 (0.01)	2.288*** (3.31)	-0.821 (0.48)	2.070** (2.52)	-0.270 (0.30)	2.251** (2.52)	1.916** (1.99)
Log develop expenditure per capita				-3.468 (0.82)	-0.983 (0.32)	-2.900 (0.79)	-4.044 (0.94)
Log installed electricity capacity per capita				0.242 (0.28)	1.260 (1.60)	1.058 (1.02)	0.875 (1.27)
Log state population				-5.448 (0.29)	38.74 (1.28)	-3.717 (0.19)	-10.42 (0.56)
Congress majority				0.418** (1.98)	0.206 (0.63)	0.464** (2.36)	0.452** (1.99)
Hard left majority				0.508* (1.76)	-0.083 (0.21)	0.501 (1.46)	0.306 (0.39)
Janata majority				0.518 (1.14)	0.819 (1.28)	0.326 (0.73)	0.557 (1.19)
Regional majority				0.463*** (2.86)	0.439 (0.90)	0.504*** (2.76)	0.487*** (2.86)
State effects	YES	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.83	0.88	0.80	0.89	0.91	0.87	0.89
Observations	547	547	547	518	518	311	485

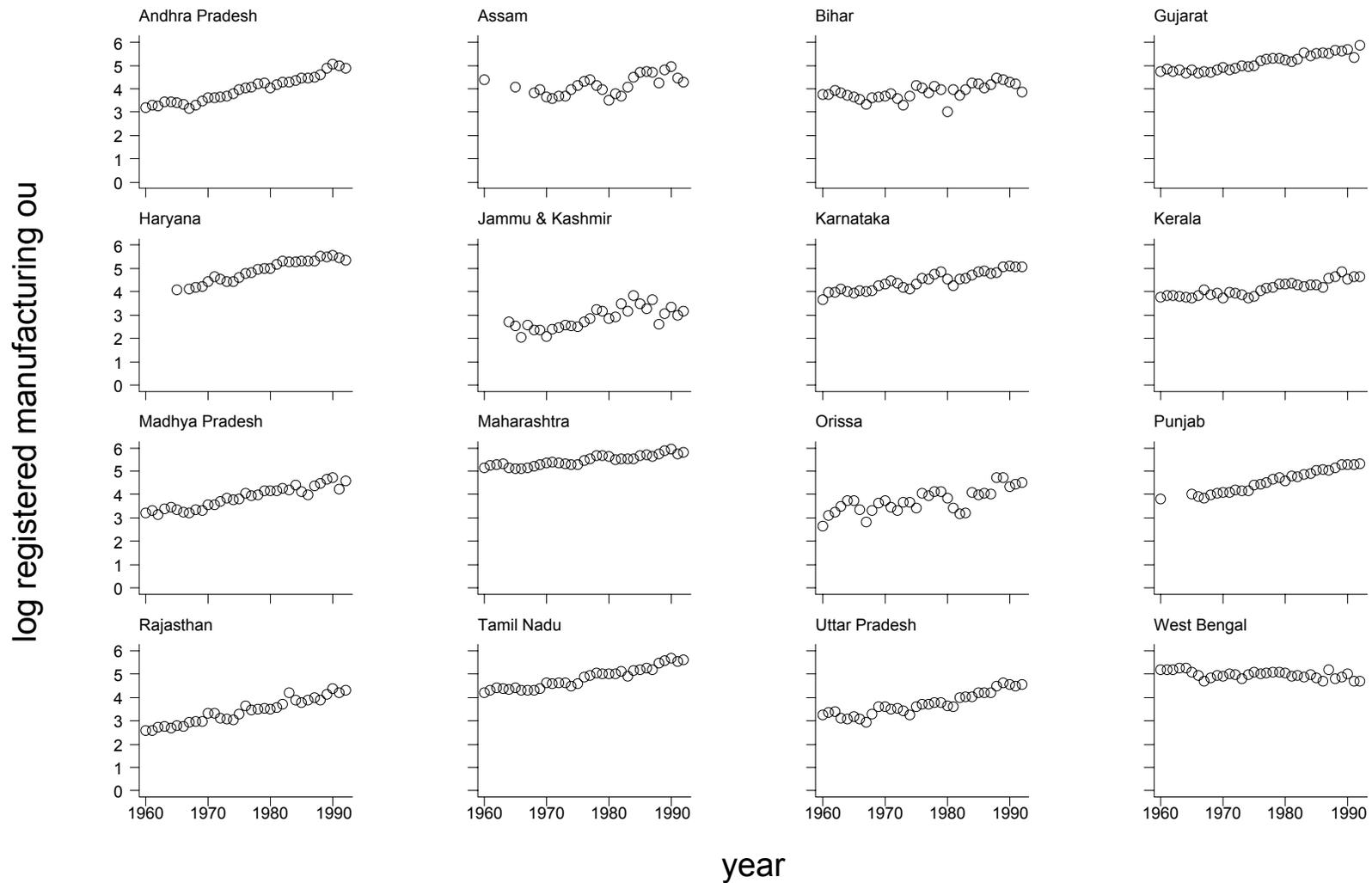
Notes: Absolute t statistics calculated using robust standard errors clustered at the state level are reported in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Poverty headcount is the percentage of the population below the official Indian poverty lines which are separately defined for rural and urban areas. In column (4) the rural-urban poverty difference is the difference between the rural and urban headcount measures for each state. In column (7) we only include data for years when National Sample Surveys were carried out. State amendments to the Industrial Disputes Act are coded 1=pro-worker, 0=neutral, -1=pro-employer and then cumulated over the period to generate the labor regulation measure. Installed electrical capacity is measured in kilowatts and development expenditure is real per capita state spending on social and economic services. Congress, hard left, Janata and regional majority are counts of the number of years for which these political groupings held a majority of the seats in the state legislatures. The data are for the sixteen main states for the period 1958 - 1992. Haryana split from the Punjab in 1965 and, after this date, we include Haryana as a separate observation. We therefore have a total of 552 possible observations with deviations accounted for by missing data. See the Data Appendix for details on the construction and sources of the variables.

Appendix Table: Regulatory Change in India: 1958 - 1992

State	Change Year	Amendments and codes	Overall Code
Andhra Pradesh	1968	Limits strikes and lockouts in designated public utilities [-1].	Pro-employer
	1982	Facilitates settlement of industrial disputes in labor courts [-1]	Pro-employer
	1987	Prohibits strikes and lockouts when in the public interest [-1]. Workers have to be paid before closing down firm [1]. Prior workers given preference when rehiring [1]. Dismissed workers paid from reinstatement not rehiring date [1]. Imposes penalty for not complying with order prohibiting industrial disputes [-1]. Individual workers can apply to labor court for adjudication [1]. Widens judicial powers to recover money owed to workers by employer [1]. Lengthens the notice employer must give worker about change in conditions of service [1].	Pro-worker
Gujarat	1973	Imposes penalty on employer for not nominating representatives to councils within firms [1].	Pro-worker
Karnataka	1988	Individual workers can apply to labor court for adjudication [1]. Enforces attendance at industrial dispute hearings [-1]. Empowers state governments to transfer disputes across tribunals to facilitate settlement [-1]. Prohibits strikes and lockouts when in the public interest [-1]. Extends rules for layoff, retrenchment and closure to smaller firms [1].	Pro-employer
Kerala	1979	Prohibits strikes and lockouts when in the public interest [-1]. Imposes penalty for not complying with order prohibiting industrial disputes [-1].	Pro-employer
Madhya Pradesh	1982	Extends powers of labor courts to settle industrial disputes. [-1]. Facilitates settlement of industrial disputes in labor courts [-1]	Pro-employer
	1983	Applies closure rules to previously uncovered undertakings [1].	Pro-worker
Maharashtra	1981	Compensation now received for closure due to lay-off [1]. Workers receive 100% as opposed to 50% of wages for layoff due to electricity problems [1]. Extends rules for layoff, retrenchment and closure to smaller firms [1].	Pro-worker
	1983	Gives power of appeal to workers to overturn decision to close down firm [1].	Pro-worker
Orissa	1983	Extends rules for layoff, retrenchment and closure to smaller firms [1]. Gives power of appeal to workers to overturn decision to close down firm [1].	Pro-worker
Rajasthan	1960	Exact criteria for being union member defined [-1]. Defines employers in firms sub-contracted to industry as employers for industrial disputes purposes [1]. Defines who is allowed to be involved in bargaining process on behalf of unions [-1]. Gives definition of what a union is in an industrial dispute [-1]. Definition of worker for industrial disputes purposes extends to those subcontracted with an industry [1].	Pro-employer
	1970	Empowers the states to refer industrial disputes to industrial tribunals when it is in the public interest [-1]. Prohibits strikes and lockouts when in the public interest [-1]. Imposes penalty for not complying with order prohibiting industrial disputes [-1]. Widens judicial powers to recover money owed to workers by employer [1]. Defines union registration rules to prevent multiple representation [-1].	Pro-employer
	1984	Extends rules for layoff, retrenchment and closure to smaller firms [1]. Can continue lay-offs due to natural disasters for more than 30 days without permission [-1]. Union representative has to be involved in negotiations concerning retrenchment of workers [1]. Applies closure rules to previously uncovered undertakings [1]. Increases penalty for unauthorized layoff and retrenchment of workers [1]. Extends rules for layoff, retrenchment and closure to smaller firms [1].	Pro-worker

Tamil Nadu	1982	Prohibits strikes and lockouts when in the public interest [-1]. Imposes penalty for not complying with order prohibiting industrial disputes [-1].	Pro-employer
West Bengal	1974	Prohibits lay-off of worker given employment on same day [1].	Pro-worker
	1980	Includes workers involved in sales in definition of worker [1]. Retrenchment does include workers terminated on grounds of ill-health [1]. Extends period within which report of conciliation proceedings must be submitted [1]. Extends date at which conciliation proceedings are deemed to have started [1]. Facilitates settlement of industrial disputes in labor courts [-1]. Facilitates the making of awards by labor courts [1]. Limit on the number of days laid off workers receive 50% of their wages is removed [1]. Laid off worker only have to present themselves once a week at the plant if lay off extends for more than seven days [1]. Workers have to be paid before closing down firm [1]. Prior workers given preference when rehiring [1]. Dismissed workers paid from reinstatement not rehiring date [1]. Extends rules for layoff, retrenchment and closure to smaller firms [1]. Extends period after which employer can commence lay-off [1]. Widens judicial powers to recover money owed to workers by employer [1]. Lengthens the notice employer must give worker about change in conditions of service [1].	Pro-worker
	1986	Makes transparent the award procedures to be followed and relief to be given to discharged, dismissed or retrenched workers.	Pro-worker
	1989	Individual workers can apply directly to conciliation officer and labor court for adjudication [1]. Employers have to demonstrate ability to pay compensation to pay workers before closing down firm [1]. Refusal of employment is grounds for an individual worker to enter into an industrial dispute [1].	Pro-worker

Notes: coding of text of amendments from Malik [1997]. Fuller summaries of all amendments and their coding is available at <http://econ.lse.ac.uk/staff/rburgess/wp>.



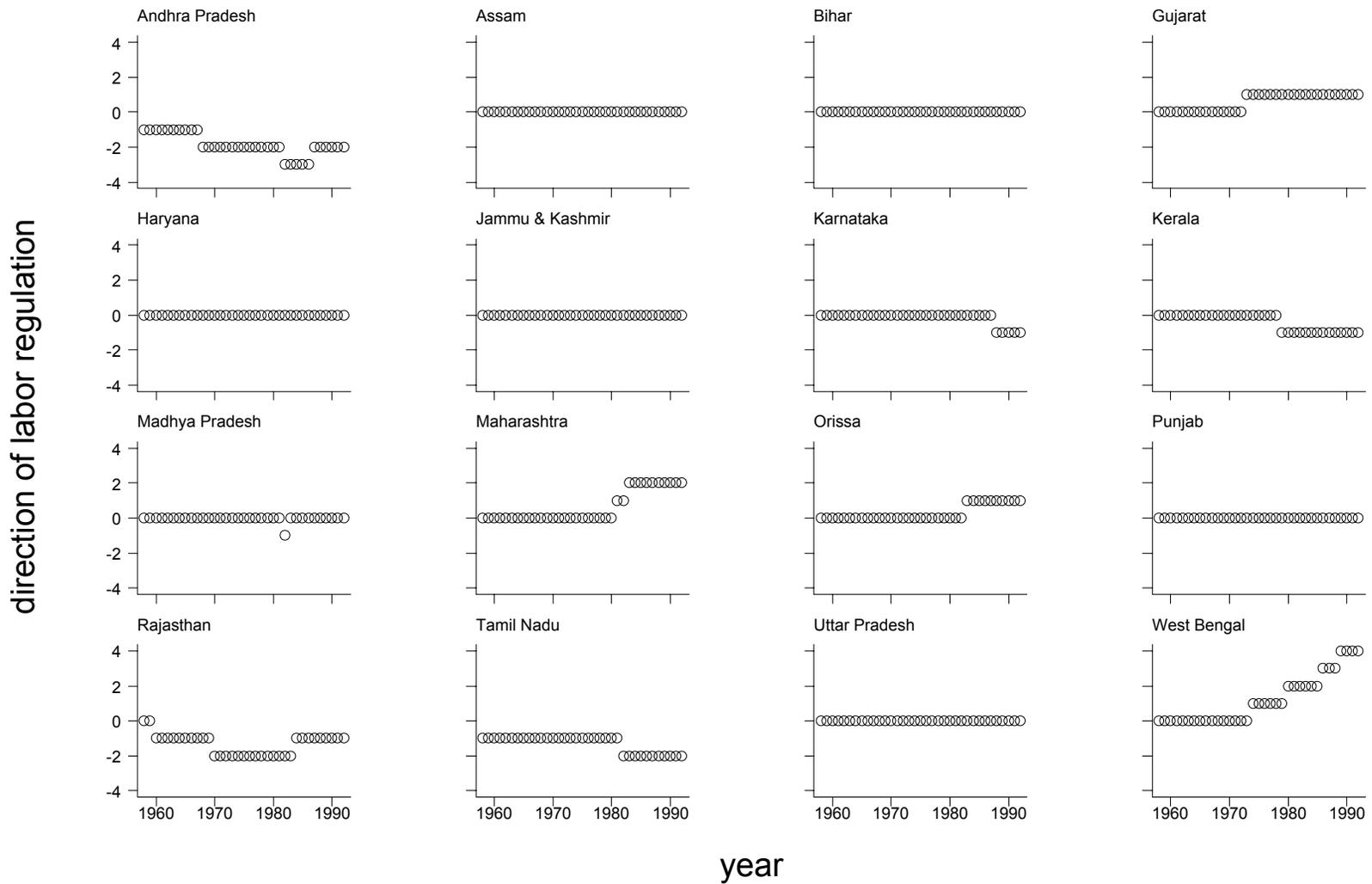


Figure 2: Labor Regulation in India: 1958-1992

### Derivation of 0.3%-point increase in growth from the implementation of “employment-at-will”<sup>1</sup>

A baseline study in the literature of the impact of employment protection on productivity and therefore output and growth is by David Autor, William Kerr and Adriana Kugler. Their research shows that mandated employment protection reduces productivity, employment, and new firm entry and gives firms the incentive to replace labor with capital.<sup>2</sup> These issues are exacerbated in economies that have relatively large informal sectors as is the case in Puerto Rico.<sup>3</sup>

In view of the strong econometric results of the negative impact of employment protection on employment, we then looked to find estimates of the impact of employment protection reform on growth. The most comprehensive study that we found looked at the significant labor market reforms taken in countries in the Euro Area periphery in the last decade. These countries face an economic environment very similar to that of Puerto Rico—strong economic links to a much larger economic entity and no independent monetary and exchange rate policies. The policies pursued by these countries were broader in scope and included reforms on both the demand and supply of labor, including, streamlining employment protection legislation, reforming unemployment benefits, increasing child support, and pension reform. All told these reforms made labor markets more flexible, increased labor supply, and led to a long-run additional 3.5% annual growth in peripheral European countries. Key to our analysis here was the finding that the elimination of employment protection (which goes at the heart of “employment-at-will” reforms), within the context of these broader reforms, **accounted for 0.5% of permanent growth.**<sup>4</sup>

In the case of Italy, the growth impact of easing employment protection was assumed to raise productivity and thereby growth by 0.3 percentage points, as the Italian reform did not reach the level of OECD best practices.<sup>5</sup> A follow up study in Italy showed that employment protection deregulation improved the quality of matches in the Italian labor market in the second year after implementation, with the odds of a worker being well-matched increasing by almost 16%. The employment protection reform, by increasing labor turnover that, in turn improves matching, resulted in higher productivity.<sup>6</sup>

<sup>1</sup> By Andrew Wolfe; see attached biography.

<sup>2</sup> Autor, D., Kerr, W. and Kugler, A. “Does Employment Protection Reduce productivity? Evidence from US States,” The Economic Journal, Vol. 117, June 2007.

<sup>3</sup> See the case of Peru in Saavedra, J. and M. Torero (2004), “Labor Market Reforms and Their Impact over Formal Labor Demand and Job Market Turnover. The Case of Peru”. URL: <http://www.nber.org/chapters/c10069>.

<sup>4</sup> See Derek Anderson et al, “Assessing the gains from structural reforms for jobs and growth,” International Monetary Fund. <https://www.imf.org/external/np/seminars/eng/2014/EURbook/pdf/7.pdf>.

<sup>5</sup> Kugler, A. and Pica, G. “Effects of Employment protection on Worker and Job Flows: Evidence from the 1990 Italian Reform,” Labour Economics, 15 (2008) pp.78-95.

<sup>6</sup> Berton, F., F. Devicienti and S. Grubanov-Boskovic (2017). “Employment Protection Legislation and Mismatch: Evidence from a Reform”. IZA DP No. 10904. July 2017

Easing employment protections through at-will employment policies would lower the cost of hiring that is substantially elevated by the potential cost of litigation. Such costs can be burdensome and thus a barrier to hiring. In a study of claims reported by small-to medium-sized enterprises, 19% of employment costs were due to defense and settlement costs to employers averaging \$125,000, well above the median salary in the US.<sup>7</sup> When claims are brought to court, the damages can be even higher: the median judgement is approximately \$200,000, and a quarter of cases result in a judgment over \$500,000 – above and beyond the legal cost of defense. In addition to this direct cost, firms additionally engage in activities to avoid litigation risk by hiring fewer workers than optimal, with resulting production inefficiencies. Dertouzos and Karoly found that wrongful termination liability creates substantial costs beyond those directly attributable to lawsuits, as employers alter their use of labor to reduce their exposure to litigation.<sup>8</sup>

In the scoring of the overall labor reform that envisages 1 full percentage point of permanent growth from the entire labor reform package, about half would come from the labor supply side through the EITC and limited work-requirement for PAN (where the literature shows estimates of permanent growth impacts of between 0.3% and 0.8%), and half from the labor demand side. Consistent with the Italian experience and the IMF study noted above, it was estimated that about 0.3% points would come from easing employment protection (i.e., implementing employment-at-will) and 0.2% points from eliminating benefit requirements, such as generous paid vacation.

<sup>7</sup> See “The 2015 Hiscox Guide to Employee Lawsuits: Employee Charge Trends across the United States,” <https://www.hiscox.com/documents/The-2015-Hiscox-Guide-to-Employee-Lawsuits-Employee-charge-trends-across-the-United-States.pdf>.

<sup>8</sup> See Dertouzos, James N and Lynn A. Karoly (1992), “Labor-Market Responses to Employer Liability,” Rand, <https://www.rand.org/content/dam/rand/pubs/reports/2007/R3989.pdf>

## CURRICULUM VITAE

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1995-1997	Senior Economist, Fiscal Affairs Department
1997-2000	Resident Representative, Peru
2001-2002	IMF Mission Chief, Peru
2002-2005	IMF Mission Chief, Uruguay
2005-2006	Senior Resident Representative, Argentina
2006-2009	IMF Mission Chief, Dominican Republic
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### PUBLICATIONS:

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# Do Foreign Investors Care about Labor Market Regulations?

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**Abstract:** This study investigates whether labor market flexibility affects foreign direct investment (FDI) flows across 19 Western and Eastern European countries. The analysis uses firm level data on new investments undertaken during 1998-2001. The study employs a variety of proxies for labor market regulations reflecting the flexibility of individual and collective dismissals, the length of the notice period and the required severance payment along with controls for business climate characteristics. The results suggest that greater flexibility in the host country's labor market in absolute terms or relative to that in the investor's home country is associated with larger FDI inflows.

*JEL classification:* F21 F23, J0

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## Introduction

While the existing empirical literature on foreign direct investment (FDI) has examined the effect of various regulatory determinants on investment flows,<sup>1</sup> no attention has been paid to one key aspect of government regulations, namely the flexibility of labor markets, despite the fact that both the anecdotal evidence and the theoretical literature suggest it ought to be important. For instance, a recent article in the *Financial Times* carried a headline stating that “Archaic Labor Laws Stop Europe Working” and argued that in the presence of labor regulations that make it hard to dismiss and to hire workers, companies can neither grow nor take advantage of new business opportunities.<sup>2</sup> Similarly, *The Economist* magazine suggested that increasing labor market flexibility is seen as crucial to the revitalization of the European economy, particularly after the accession of several Central and Eastern European Countries to the European Union.<sup>3</sup> The lack of flexibility in hiring and laying off workers is also one of the main concerns raised by investors operating in or considering entering transition economies and developing countries (Moran 1998, p. 89). This view is further echoed in a theoretical paper by Haaland et al. (2003) who demonstrate a trade-off between FDI incentives and labor market flexibility and conclude that a country with a more flexible labor market (i.e., lower redundancy payments) should find it easier to attract FDI.

This study aims to fill the gap in the literature by testing empirically whether host country’s labor market flexibility, in absolute terms or relative to that in the investor’s home

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<sup>1</sup> Wei and Schleifer (2000) examine the consequences of FDI incentives and restrictions on investment flows, Hines (1996) and Devereux and Griffith (1998) the effect of taxation, Javorcik (2004) the impact of intellectual property protection, Keller and Levinson (2002) and Javorcik and Wei (2004) the effect of environmental standards.

<sup>2</sup> *Financial Times*, March 5, 2004.

<sup>3</sup> “Many mid-cap businesses in Germany are looking aggressively at opportunities in new member states. Already workers at several German companies have reacted by accepting longer working hours for the same pay” (*The Economist*, November 6th, 2004).

country, affects the location decisions of multinationals. To the best of our knowledge, the only analysis of this question can be found in a paper by Dewit et al. (2003) who consider the impact of labor laws on aggregate FDI flows within the OECD countries in 1989 and 1998 and find that an unfavorable employment protection differential between a domestic and a foreign location is inimical to FDI.<sup>4</sup> In contrast to the work of Dewit et al. (2003), our analysis is based on firm level data and employs a much more detailed set of proxies for labor market regulations.

One of the advantages of employing firm level data is that we are able to explicitly control for the investing firm's characteristics that affect the investment decision, such as the firm size, previous FDI experience and the nature of business (i.e., manufacturing versus services). We are also able to consider a specification that takes into account unobserved investor characteristics. We use information on new subsidiaries established by the largest 10,000 European companies in 19 Western and Eastern European countries during 1998-2001. The information comes from a commercial database *Amadeus* compiled by Bureau van Dijk. Western European countries and transition economies of Eastern Europe are well suited for studying this question, as they offer a large variation in terms of labor market regulations. In both Western and Eastern Europe we can find economies with highly inflexible labor markets (France and Poland) as well as countries giving employers relative freedom in hiring and firing decisions (United Kingdom and Bulgaria).

We employ a comprehensive set of labor market flexibility measures along with a large set of controls for business climate characteristics. The former include indices compiled by Djankov et al. (2001) reflecting the flexibility of individual dismissals, the flexibility of collective layoffs, the length of the notice period and the required severance payment, as well as

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<sup>4</sup> Görg (2002) addresses a similar question using the data on the stock of US outward FDI and focusing only on the level of labor market flexibility in a host country rather than the differential between the home and the host economy.

a proxy for the flexibility of hiring and firing practices from the *Global Competitiveness Report 2001-2002* produced jointly by the Geneva-based World Economic Forum and the Center for International Development at Harvard University. Moreover, we control for the presence of restrictions on FDI inflows, protection of property rights, the level of corporate taxation and the quality of governance. Finally, we include measures of the market size and labor costs.

The results suggest that greater flexibility in the host country's labor market is associated with a higher probability of investment taking place as well as with a larger volume of investment. The same holds true for the difference between the labor market regulations in the host and the source country. When we interact the effect of labor market flexibility with a dummy for services sectors, we find that investors entering these industries are even more sensitive to labor market regulations. We also show that taking into account the presence of transition economies in the sample does not change the results.

The paper is structured as follows. In the next section we discuss the empirical model, the data and the variables definitions. Then we present the empirical results. The last section contains concluding remarks.

## **Empirical Strategy**

### **Model and Estimation Issues**

The basic question we seek to answer is whether labor market flexibility affects the flow of foreign direct investment across countries. In doing so we also consider a number of other

potential determinants of location choice, as suggested by the existing literature.<sup>5</sup> We employ two empirical strategies to address this question. First, we focus on the location of foreign subsidiaries ignoring the size of investment. We estimate a fixed effect logit model

$$\begin{aligned}
 FDI_{ic} &= 1 \text{ if } FDI_{ic}^* > 0 \\
 FDI_{ic} &= 0 \text{ otherwise} \\
 \text{where} \\
 FDI_{ic}^* &= d_i + X_c \theta + \beta Flexibility_{ic} + u_{ic}
 \end{aligned} \tag{1}$$

where the dependent variable takes on the value of one if firm  $i$  has invested in country  $c$ , and zero otherwise. For each firm the number of observations is equal to the number of possible destination countries in the sample. To control for unobservable firm characteristics, firm specific fixed effects ( $d_i$ ) are used. On the right hand side, we include the index of the host country's labor market flexibility ( $Flexibility_c$ ) or the difference in the labor market flexibility between the host and the source country ( $Flexibility_{ic} = Flexibility_c - Flexibility_i$ ) as well as other controls for host country characteristics ( $X_c$ ). Since our prior is that more flexible labor market regulations in the host country (in absolute terms or relative to the source country) are associated with a greater likelihood of foreign investment, we expect  $\beta > 0$ .

Then we focus on the size of investment and estimate the following equation

$$\ln(FDI \text{ volume}_{ic} + 1) = \alpha + X_i \Pi + X_c \Psi + \delta Flexibility_{ic} + \varepsilon_{ic} \tag{2}$$

where the volume of investment undertaken by firm  $i$  in country  $c$  is regressed on the characteristics of firm  $i$  and its home country ( $X_i$ ), variables specific to destination country ( $X_c$ ) and the proxy for labor market regulations ( $Flexibility_c$  or  $Flexibility_{ic}$ ). Again we expect  $\delta$  to be positive. The number of observations for each firm is equal to the number of potential

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<sup>5</sup> For a literature review on FDI determinants see Wheeler and Mody (1992) and Markusen (1995).

investment destinations, with the *FDI volume* equal zero for countries in which firm *i* does not have any investments. To avoid losing all observations for which *FDI volume* takes on the value of zero, we add one before taking the logarithm of the variable. Given that most firms have subsidiaries only in some of the 19 possible destination countries considered and some firms have no subsidiaries at all, in a large number of cases the dependent variable is equal to zero. Therefore, we employ the Tobit model, as using OLS would lead to inconsistent estimates.

The choice of the model is determined by the data availability. As explained below, our data set contains a comprehensive listing of the existing subsidiaries of firms included in the sample, but the information on the volume of investment is available only for a subset of them. The logit specification allows us to maximize the sample coverage, while the Tobit regression enables us to examine the determinants of the investment volume. We view the two approaches as complementary.

## **FDI Data**

The data used in this study come from the commercial database *Amadeus* compiled by Bureau van Dijk, which contains comprehensive information on approximately 5 million companies operating in 35 European countries. In addition to the standard financial statements, *Amadeus* includes complete information on the ownership structure of firms, which allows us to identify the ownership stakes held by each company in entities located in other countries. We are thus able to construct a unique data set containing detailed information about European firms and all of their domestic and foreign subsidiaries.

We focus our attention on the largest 10,000 firms operating in Europe (with the size measured by the value of total assets in 1999) and their subsidiaries located in 14 Western

European and 5 Central and Eastern European countries, including Bulgaria, the Czech Republic, Hungary, Poland and Ukraine. The choice of host countries is driven by two considerations: by the fact that information on the size of investment is available only for European subsidiaries and by our decision to restrict the analysis to subsidiaries established between 1998 and 2001. We construct the data set on new subsidiaries by comparing the subsidiary listings for companies included in both the 1998 and the 2001 versions of the *Amadeus* database.<sup>6</sup> The ownership information pertains mostly to year 2000 and in some cases to 1999. If a firm has more than one subsidiary in a given country, we focus our attention on the one with the highest value of the parent company's equity participation. The sample also includes non-investors that is, firms without any subsidiaries in foreign countries.<sup>7</sup>

After deleting firms with missing information and removing outliers,<sup>8</sup> the data set contains 7,150 parent firms with 6,391 subsidiaries in 19 destination countries, including the home country, of which 3,053 are foreign subsidiaries. The potential number of observations is thus equal to  $7,150 \times 19 = 135,850$  investment decisions at the firm level. The *Amadeus* database provides a good reflection of FDI inflows into the host countries considered. The correlation between the FDI inflows reported by UNCTAD for 1999-2000 and the total value of foreign assets in the subsidiaries listed in *Amadeus* and created in the same group of host countries during the same period is .61.<sup>9</sup>

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<sup>6</sup> We chose not to go further back in time as the earlier versions of the database were much smaller in size and contained only very limited information on subsidiaries in Eastern Europe.

<sup>7</sup> Such firms drop out from the fixed effect logit estimation but are included in Tobit regressions.

<sup>8</sup> Firms with negative or unusually large values for sales, total assets or employment were dropped from the sample.

<sup>9</sup> Total FDI inflows were calculated by subtracting the total FDI stock as of end-1998 from the corresponding figure for end-2000, as reported in the UNCTAD online database ([www.unctad.org](http://www.unctad.org)). To calculate total FDI inflows based on the *Amadeus* data we considered only subsidiaries with more than 10% foreign ownership.

## Variable Definitions

The dependent variable in Equation (1) is equal to one if the database indicates the existence of firm  $i$ 's subsidiary in country  $c$ . In Equation (2), we construct *FDI volume* by multiplying the percentage of the equity owned by firm  $i$  in its subsidiary located in country  $c$  by the total assets of the subsidiary. If firm  $i$  has more than one subsidiary in country  $c$  we use the largest investment. If no subsidiary exists, the variable takes on the value of zero. All information from the *Amadeus* database presented in national currencies is converted to U.S. dollars using the average market exchange rate for the given year from the IMF's *International Financial Statistics*.

In addition to taking into account conditions in the host country, our data set provides us with an opportunity to control for characteristics of parent companies. We do so only in Equation (2) as Equation (1) includes parent fixed effects. As larger firms and firms with greater international experience may be more likely to expand into foreign countries (see Javorcik 2004 for empirical evidence), we control for the firm size using the value of total assets and for the international experience by including the total number of foreign subsidiaries. In order to avoid simultaneity we use the values of these variables pertaining to 1998, which is the first year considered in our sample.<sup>10</sup> We expect to find a positive coefficient on both variables. We also take into account the population size, the average wage and GDP per capita of the source country, expecting that more FDI is likely to come from larger and richer countries and from economies with higher labor costs. The average wage is calculated as the average of wages paid

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<sup>10</sup> Note that the number of subsidiaries pertains to investments located all over the world, not just in the 19 countries considered in our sample.

by the top 10,000 firms in each country.<sup>11</sup> The population and GDP per capita figures come from the World Bank's *World Development Indicators*.

Since the purpose of our paper is to test for the effect of labor market flexibility on the multinational firm's decision to invest in various countries, it is crucial to have plausible measures of labor market regulations. The first measure used in our analysis is the *Index of Flexibility of Hiring and Firing Practices* from the *Global Competitiveness Report 2001-2002* (hereafter GCR index) published jointly by the Geneva-based World Economic Forum and the Center for International Development at Harvard University. It is a country specific index that quantifies the average response to the survey question: "Is hiring and firing of workers impeded by regulations or flexibly determined by employers?" It takes on the value of 7 for a very flexible labor market and 1 in the case of the most rigid ones. Since it is based on the views of "business practitioners" in each country, it captures not only laws on the books but also their enforcement.

We also include four additional measures, compiled by Djankov et al. (2001), reflecting the strength of employment protection legislation, which relates to employers' liberty to lay off workers. These are: *the Index of the Flexibility of Individual Dismissal Procedures*, *the Index of the Flexibility of Collective Dismissal Procedures*, *the Index of Notice and Severance Payment* and *the Overall Index of Rules of Dismissal*.<sup>12</sup> These indices rely on information collected in 2001 and thus match well the time period of our sample. The value for the *Overall Index of Rules of Dismissal* ranges from 0 to 12, with 0 representing very strict rules of dismissal and 12 the most ample ones. Thus, the higher the index value, the less costly it is for the employer to dismiss workers. The indices are country specific but, since firing costs are usually comparable

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<sup>11</sup> Top 10,000 firms in decreasing order of total assets and with more than 5 employees in 1999.

<sup>12</sup> These indices were also used by Botero et al. (2004).

across industries as they are set by the national legislation, the use of country level data is appropriate.

As illustrated in Figures 1 and 2, there is a large variation in the 19 countries considered in our sample in terms of labor market flexibility. In both Western and Eastern Europe we can find economies with inflexible labor markets (France and Poland) as well as countries giving employers relative freedom in hiring and firing decisions (Denmark and Hungary). While there are some differences in individual rankings between the GCR and the Overall Index of Rules of Dismissal, the two measures appear to be highly correlated (see Figure 3). Therefore, we start our analysis by including labor market indices one by one in the regressions. As higher labor market flexibility is associated with lower costs of doing business, we expect to find a positive relationship between the probability of FDI or the investment volume and the host country's flexibility of labor markets. Recognizing that impediments to adjusting employment numbers constitute a push factor encouraging firms to transfer production out of their own country as well as a pull factor enticing firms to enter economies with flexible rules, we also focus on the difference in labor market flexibility between the host and the source country. As *higher* values of the variable correspond to *greater* flexibility in the host country relative to the source country, we expect to find a *positive* relationship between  $Flexibility_{ic}$  and the likelihood or the volume of investment.

Turning to other host country characteristics, we control for factors commonly mentioned in the literature as determinants of FDI, including proxies for the market size (population size) and the labor costs in the host country (average wage). We expect that larger markets attract investors while higher labor costs act as a deterrent. As in the case of labor market flexibility variables, we also allow for the difference in labor costs between the home and host country. The

higher the labor costs difference between the home and the host country, the higher the likelihood of FDI or the volume of investment.<sup>13</sup>

We also control for various aspects of the business climate in the host country. The first control is the FDI Restrictions Index derived by Wei and Schleifer (2000) based on reading the detailed country reports produced by PricewaterhouseCoopers. The index focuses on four areas: the existence of foreign exchange controls (which may interfere with foreign firms' ability to import intermediate inputs or repatriate profits abroad), the exclusion of foreign firms from strategic sectors (e.g., defense industry, media), the exclusion of foreign firms from other sectors, and restrictions on the share of foreign ownership. Each of these four dimensions is represented by a variable taking on the value of 1 in the presence of restrictions and 0 otherwise. The overall index is defined as the sum of these variables and ranges from 0 (no restrictions) to 4 (restrictions present in all areas).

The second control is the Index of Property Rights, which comes from the *Global Competitiveness Report 2001-2002*. It is based on an extensive survey of managers who were asked to rate on the scale 1 to 7 whether the "property rights [in a given country] are clearly delineated and protected by law." Subsequently, the arithmetic mean of all responses by country was reported. A score of 7 corresponds to countries with well protected property rights and 1 to the countries with little or no protection. This variable is intended to capture the country specific risk that multinational firms may face from possible expropriation of assets, insecurity of property rights and contracts.

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<sup>13</sup> Some of the existing studies on location decision of multinational firms include wages, while others control for both wages and labor productivity. The results are mixed. Coughlin et al. (1991) and Friedman et al. (1992) find that higher wages deter foreign direct investment, while Ondrich and Wasylenko (1991) do not detect a statistically significant relationship. Only Friedman et al. (1992) controls explicitly for productivity and finds a positive correlation. More recently, Thomsen (1995) shows that the location of export platforms of US FDI in European countries is negatively affected by unit labor costs.

Another potentially important factor influencing the FDI location is the level of corporate taxation in the host country, as demonstrated by Hines (1996) and Devereux and Griffith (1998). We employ the corporate tax rates reported by PricewaterhouseCoopers. All taxes are expressed in percentages; if several rates apply, the highest one is used. We anticipate that high tax rates deter FDI. We also expect the difference in taxation rates between the home and the host country to be positively correlated with the probability of investing abroad as well as with the volume of investment.<sup>14</sup>

Finally, we add a dummy variable for transition countries to control for other differences between industrialized and transition economies that may not be captured by the explanatory variables. For instance, if a large presence of foreign investors encourages subsequent inflows due to agglomeration effects and transmission of knowledge about the host country to source economies, then transition countries are at a disadvantage vis-à-vis Western Europe as they have opened to FDI relatively recently.

All variables definitions and data sources are summarized in Table 1.

As can be seen in Table 2, a large degree of heterogeneity is found in terms of the business environment in host countries in our sample. Transition economies usually rank low with respect to property rights protection. However, the picture is mixed with regard to FDI incentives, labor market flexibility and corporate taxation, as in both Western as well as Eastern Europe we find countries with very different scores in these areas. For instance, while some transition economies, especially Hungary, the Czech Republic and Poland, have no or very few restrictions on FDI, others, such as Ukraine, have restrictions in all categories. Similarly, while Ukraine has the highest corporate tax rate, Hungary offers the lowest one in the sample. More importantly for the topic of interest, we find a large variation with respect to labor market

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<sup>14</sup> Corporate tax rates are, however, an imperfect proxy as in some cases exceptions for foreign investors may apply.

regulations. The Overall Index of Dismissal Rules range from a score of 3 (rigid labor markets) for Portugal and Ukraine to 8 (flexible) for Austria and Hungary and 11 (highly flexible) for Belgium.

## Estimation Results

### FDI Determinants

We begin by examining determinants of FDI and proceed by including one by one the five measures capturing a host country's labor market flexibility. We estimate a logit model with fixed effects for each investing company.<sup>15</sup> The results are presented in Table 3. We find a positive and significant coefficient on the host country's population size, suggesting that larger countries are more attractive investment destinations. Further, the data suggest that lower restrictions on FDI and stronger property rights protection are associated with a higher probability of FDI taking place. As anticipated, we find a negative and statistically significant coefficient on the corporate tax rate in the host country, which suggest that, all things being equal, more taxation deters FDI. The coefficient of the host country average wage is positive and significant, which is somewhat counterintuitive, yet not unusual in the literature on determinants of FDI as the average wage may be capturing the purchasing power of the population. Finally, the dummy for the host country being a transition economy is negative and significant indicating that transition countries have a lower probability of receiving FDI than what would be predicted given their economic and regulatory environment. The transition economies dummy is

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<sup>15</sup> Note that in the fixed effect logit, firms without any investment projects drop out of the estimation.

introduced in the model to capture some common unobserved characteristics of the transition countries. Excluding it, however, would not affect the conclusions of the analysis.

We now turn our attention to the labor market variables. As higher values of these variables correspond to a more flexible labor market in the host country, we expect the estimated coefficient to be positive if greater flexibility in the host economy attracts FDI. We start with the Indices of Dismissal Rules. The first measure included is the Index of Flexibility of Individual Dismissal Procedures. Its coefficient is positive and statistically significant at the one percent level, thus suggesting that indeed, *ceteris paribus*, the more flexible the host country's labor market, the higher the probability of FDI taking place. The same conclusion is reached when the Index of Flexibility of Collective Dismissal Procedures, the Index of Notice and Severance Payment as well as the Overall Index of Rules for Dismissal are used. In all cases, the indices have positive and highly significant coefficients. We also use the GCR Index of Flexibility of Hiring and Firing Practices and again find evidence of a positive relationship between the labor market flexibility and the location choice of multinational investors. In addition, we estimate a model including all three components of the Overall Index of Dismissal Rules. We find that two of them (Severance Payment Rules and Collective Dismissal Rules) remain positive and statistically significant. Finally, we include the GCR index in addition to the three components of the Overall Index of Dismissal Rules. The Severance Payment Rules Index and the GCR index bear positive and significant coefficients. The lack of significance of the other two indices is most likely due to high correlation between various measures of labor market flexibility.

Next, we focus on explaining the determinants of FDI volume rather than the mere fact of investment taking place. We employ the Tobit specification and follow the same procedure of

consecutively adding labor market variables to the regression, keeping the same controls as before. In addition, we include some source country characteristics, such as the logarithm of the GDP per capita and the population size. We also account for the characteristics of the investing firm, in particular its size and its international experience.<sup>16</sup>

The results, presented in Table 4, confirm our previous findings that the labor market flexibility in the host country is an important factor affecting the location decision of multinational firms. When entered one at a time, all five indices of the host country labor market flexibility have the expected positive signs and are statistically significant at the one percent level. When we include all labor market flexibility measures in the same regression, all measures with the exception of the Individual Dismissal Rules Index remain positive and statistically significant. The other controls for host country characteristics have the same signs as in the fixed effects logit regressions and are highly significant. The only exception is the host country average wage, which now bears a negative and statistically significant sign in five out of seven specifications. As for investor characteristics, we find that larger firms as well as firms with greater international experience are more likely to undertake FDI. The same is true of firms headquartered in richer countries.

To test the robustness of these results and to make sure that they are not driven by the presence of transition countries, we restrict the sample to Western European economies. As before, all four labor market variables are statistically significant and bear the expected positive sign (see panels A and B of Table 5). As a further robustness check, we express the FDI volume relative to the host country GDP. As illustrated in Panel C of Table 5, the results confirm our

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<sup>16</sup> Note that the number of observations is smaller in Tobit than in the fixed effects logit regressions due to missing observations on the investment volume.

previous findings that labor market flexibility is an important factor explaining the volume of foreign direct investment in host countries.

One may argue that FDI decisions are not driven by the labor market regulation in the host country but rather by the *difference* in the flexibility of firing and hiring between the source and the host country. For instance, a French company may have a greater incentive to engage in FDI than its British counterpart simply because French labor market regulations are more stringent than those prevailing in the U.K. Therefore, next we examine how the differences in labor market regulations between the home and the host countries influence the FDI location choice. For the purpose of consistency other variables, where the differential in the business environment between the source and the host country (rather than the absolute level) is likely to matter, enter in the relative form. These are: corporate tax rates and wage rates. We do not enter the population size in the relative form since we do believe that it should matter for FDI decisions. Similarly, we do not include relative GDP per capita as it is highly correlated with relative wage rates.

The results are presented in Table 6. As a higher value of the labor market flexibility term corresponds to more flexible host country's labor market relative to the source country (recall that  $Flexibility_{ic} = Flexibility_{host} - Flexibility_{source}$ ), we expect to obtain a positive coefficient. And indeed we find evidence that a more flexible labor market in the host country relative to the home country is associated with a higher likelihood of investment. The magnitude of the effects is economically meaningful. As the labor market flexibility in the host country (keeping the source country and other things constant) increases from the level of France (inflexible) to the level of the United Kingdom (flexible) the volume of investment goes up by between 12 and 26 percent depending on the measure employed.

As expected, we find that a differential in corporate tax rates is positively associated with the likelihood and the volume of investment. Note that to facilitate the interpretation of the results, we define the differences in tax rates and wages as those prevailing in the source country relative to those in the host (i.e.,  $Tax\ rate_{ic} = Tax\ rate_{source} - Tax\ rate_{host}$ ). On the other hand, the difference in the average wages appears to be negatively correlated with the probability of investing abroad and the investment size. However, this may not be surprising since most of the FDI originates from and is destined for rich countries that differ little in terms of wage level. All other variables have the expected signs.

The regressions presented so far constrain the effects of labor market flexibility on FDI to be equal across countries. This may be a strong assumption since the sample of host countries in our data set includes both industrial and transition economies. To relax this assumption we introduce an interaction between the labor market flexibility measures and the dummy variable for transition host countries and repeat the exercise. As illustrated in Table 7, the coefficients of the labor market differentials remain positive and highly significant in all regressions. The interaction terms with the transition dummy are negative and significant in six cases, which suggests that the relationship between the value of investment and the labor market flexibility appears to be weaker for transition countries than for the sample as a whole. In all regressions, however, the link between labor market flexibility and the value of FDI in the sample as a whole remains robust. Thus we conclude that the presence of transition economies in our sample does not drive the results.

## Robustness Checks

As an additional robustness check we also control for the quality of governance in the host country using the measure derived by Kaufmann, Kraay and Zoido-Lobaton (KKZ) and described in detail in their 1999 and 2002 publications. When constructing their measure based on data from 17 different sources, the authors assume that the available individual country ratings reflect both some true but unobserved level of governance as well as sampling variations and perception errors. The unobserved “true” level of governance can be backed out statistically (assuming a linear unobserved component specification). The resulting estimates range from  $-2.5$  to  $2.5$ , with a mean of zero and standard deviation of one. The higher the estimate, the less corrupt and better governed the country. The results, not reported here to conserve space, are robust to including the KKZ index—all labor market flexibility proxies have the expected sign and remain statistically significant.<sup>17</sup>

As yet another robustness check (not presented here), we apply the same approach to all *existing* rather than only *new* subsidiaries of the top 10,000 European companies. In the case of multiple subsidiaries being held by the same parent company in a given host country, we include only the largest investment in the sample, regardless of when the subsidiary was created. The rationale for this exercise is that multinational companies tend to respond quickly to a change in the business environment by relocating their activities to other places. As expected, we obtain results consistent with our previous findings. Labor market flexibility variables are again consistently positive and statistically significant, reinforcing our earlier results that labor market conditions are key determinants of both the location and the volume of FDI.

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<sup>17</sup> Note that since the KKZ and the Strength of the Property Rights indices are highly correlated, we drop the latter when the KKZ variable is included.

## **Manufacturing versus Services Sectors**

If labor market flexibility indeed matters for the location choice of multinational companies, we would expect it to be of greater importance to multinationals in more labor-intensive sectors. Since services are usually more labor-intensive than manufacturing, and since our rich database includes information about the industry in which the investing company operates, we examine whether the two types of sectors respond differently to labor market regulations. To do so, we introduce an interaction between a dummy variable equal to one for services sectors and the proxies for labor market flexibility and follow the same empirical strategy as before. The results, presented in Tables 8, confirm our hypothesis. We find that the interaction terms are statistically significant and positive in all cases. That is, labor market flexibility matters more for investors in services sectors than those in manufacturing industries.

## **Conclusions**

Labor market rigidities are often cited as one of the factors multinationals take into account when deciding on a prospective host country, yet hardly any attention has been paid to this issue in the empirical literature. This paper is an attempt to further our knowledge in this area. Using firm level data on new foreign investments undertaken by European companies during the period 1998-2001 and a comprehensive set of labor market indicators, we examine the impact of labor market flexibility on FDI inflows into 19 European countries.

Our empirical findings are as follows. The FDI location choice as well as the volume of FDI are positively related to labor market flexibility in the host country and to the difference between labor market regulations in the host and the source country. That is, a more flexible

labor market in the host economy (relative to the investor's home country) is associated with a higher likelihood of investment. As expected, this effect matters more for firms operating in services sectors than for manufacturing companies.

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Figure 1. GCR Index

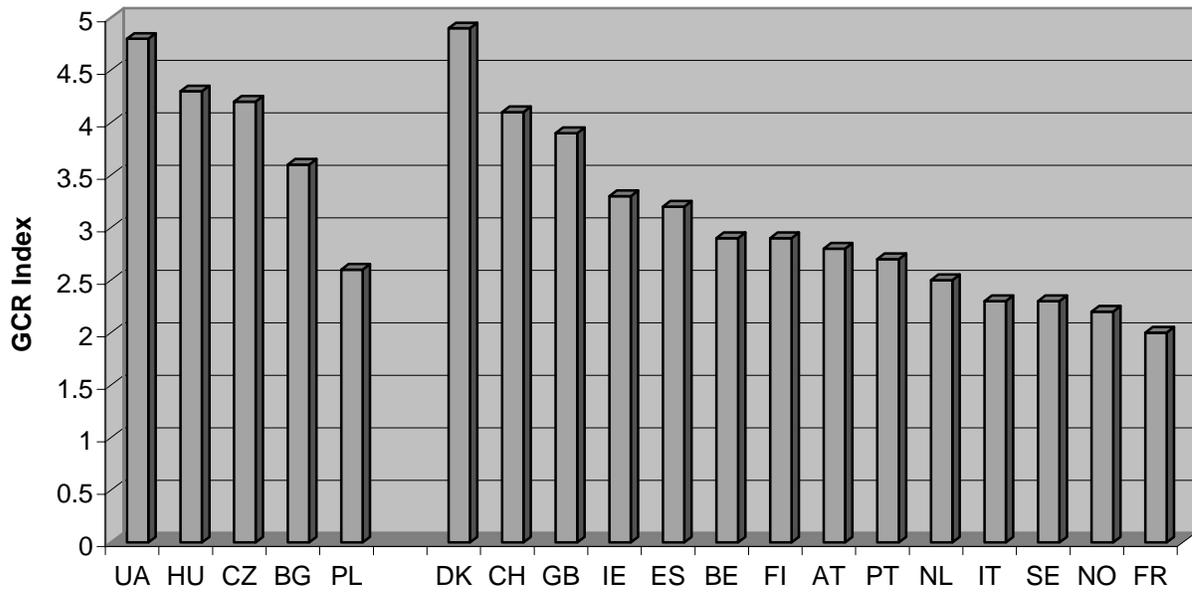


Figure 2. Overall Index of Rules of Dismissal

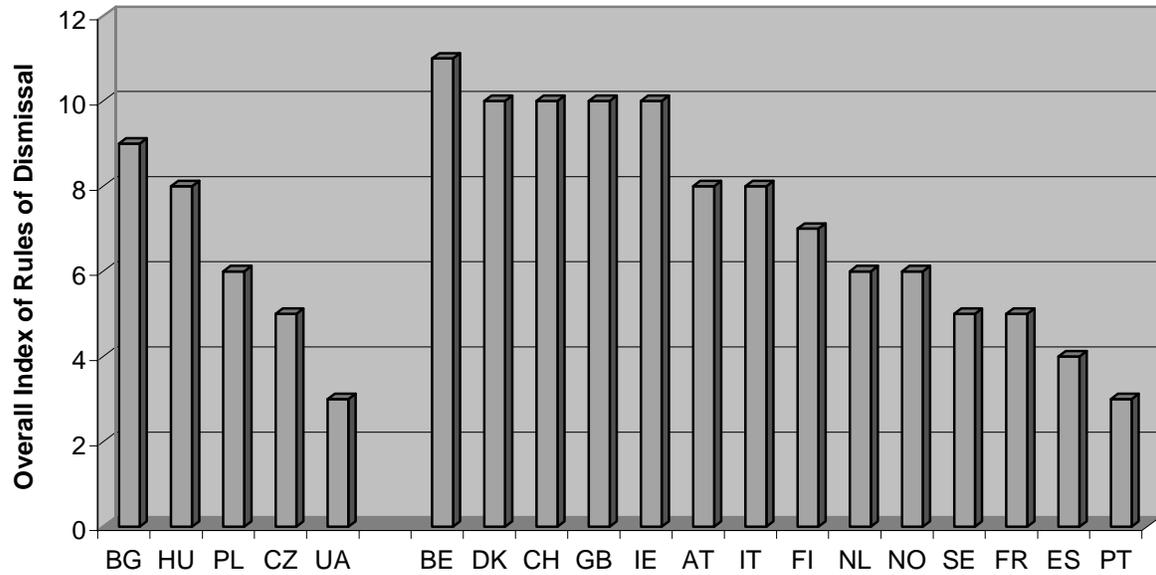


Figure 3. Comparison of Both Labor Market Flexibility Indices

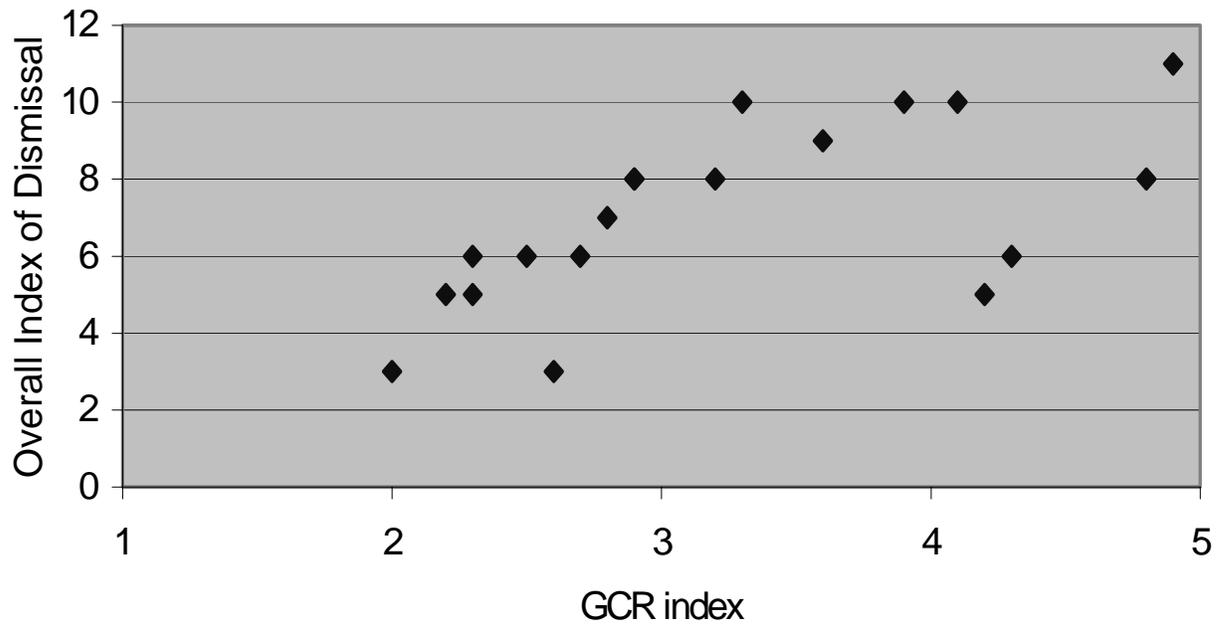


Table 1: *Variable Definitions and Data Sources*

Variable	Definition	Source
FDI <sub>ic</sub>	Equal to 1 if a new subsidiary was created by firm <i>i</i> in country <i>c</i> during 1998-2001, and 0 otherwise	<i>Amadeus</i> database
FDI volume <sub>ic</sub>	The value of firm <i>i</i> 's investment into a new foreign subsidiary in country <i>c</i> (expressed in logarithmic form)	Own calculations based on the <i>Amadeus</i> database
Firm's size	Value of total assets in US dollars (expressed in logarithmic form)	<i>Amadeus</i> database
Firm's international experience	Number of foreign subsidiaries in 1998	<i>Amadeus</i> database
GDP per capita	Current US dollars (expressed in logarithmic form)	World Bank World Development Indicators Database
Population size	Expressed in logarithmic form	World Bank World Development Indicators Database
FDI Restrictions Index	Ranges from 0 for no restrictions to 4 for restrictions present in all areas	Wei and Schleifer (2000)
Property Rights Index	Ranges from 1 for little or no protection, to 7 for strongest protection of property rights	<i>Global Competitiveness Report 2001-2002</i>
Corporate tax rate	Expressed in percentages	PricewaterhouseCoopers
KKZ Governance Index	Ranges from -2.5 for very corrupt to 2.5 for best governed	Kaufman, Kraay and Zoido-Lobaton (2002)
GCR Index of Flexibility of Hiring and Firing Practices	Ranges from 0 for a very rigid to 7 for a very flexible labor market. Is based on equally weighted answers to the following question: -“Is hiring and firing of workers impeded by regulations or flexibly determined by employers?”	<i>Global Competitiveness Report 2001-2002</i>
Overall Index of Rules of Dismissal	Ranges from 0 for very strict to 12 for very flexible rules	Djankov et al. (2001)
Index of the Flexibility of Individual Dismissal Procedures	Ranges from 0 for very strict to 2 for very flexible rules. Is based on equally weighted answers to the following questions: -“Does the employer need to notify a third party before dismissing one redundant employee?” -“Does an employer need the approval of a third party to dismiss one redundant employee?”	Djankov et al. (2001)
Index of Flexibility of Collective Dismissal Procedures	Ranges from 0 for very strict to 5 for very flexible rules. Is based on equally weighted answers to the following questions: -“Does the employer need to notify a third party prior to collective dismissal?” -“Does the employer need the approval of a third party prior to a collective dismissal?” -“Are there laws mandating retraining or replacement prior to dismissal?” -“Are there priority rules applying to dismissal or lay-offs?” -“Are there priority rules applying to re-employment?”	Djankov et al. (2001)
Index of Notice Period and Severance Payment	Ranges from 0 for very strict to 2 for very flexible rules. Based on the sum of two scores: - the legally mandated notice period (in weeks) is above the sample median for 73 countries; - the severance pay as a number of months for which full wages are payable after covered employment of three years is above the sample median for 73 countries	Djankov et al. (2001)
Transition Country Dummy	Equal to 1 for transition countries (Bulgaria, Czech Republic, Hungary, Poland, Ukraine), and 0 otherwise.	

Table 2: *Host Country Characteristics*

Country	ln GDP per capita	ln Population	FDI Restrictions Index	Property Rights Index	Tax rate	KKZ Governance Index	GCR Labor Market Index	Indices of Dismissal Rules			Overall index
								Individual dismissal	Collective dismissal	Severance payment	
Austria	10.2	15.9	2	6.4	34	2.02	2.8	1	3	1	8
Belgium	10.1	16.1	0	5.9	40	1.23	2.9	2	4	2	11
Bulgaria	7.4	15.9	2	3.2	36	-0.5	3.6	2	4	2	9
Switzerland	10.5	15.8	1	4.1	23	2.58	4.1	2	4	1	10
Czech Republic	8.6	16.1	1	4.4	35	0.35	4.2	1	3	0	5
Denmark	10.4	15.5	2	6.4	34	2.57	4.9	2	3	2	10
Spain	9.6	17.5	2	5.9	35	1.58	3.2	1	1	1	4
Finland	10.1	15.5	2	6.5	28	2.55	2.9	2	2	1	7
France	10.1	17.9	2	6.4	33.3	1.75	2.0	1	1	1	5
Great Britain	10.1	17.9	0	6.3	30	2.32	3.9	2	4	2	10
Hungary	8.5	16.1	0	5.3	18	0.69	4.3	2	3	1	8
Ireland	10.1	15.1	1	6.1	32	2.15	3.3	2	3	2	10
Italy	9.9	17.9	2	6.2	37	1	2.3	2	2	1	8
Netherlands	10.1	16.6	0	6.5	35	2.48	2.5	0	2	2	6
Norway	10.4	15.3	2	5.9	28	2.34	2.2	1	1	2	6
Poland	8.3	17.5	1	4.6	32	0.49	2.6	1	2	1	6
Portugal	9.3	16.1	1	5.3	36	1.55	2.7	2	1	0	3
Sweden	10.2	16.0	0	5.9	28	2.54	2.3	1	1	1	5
Ukraine	6.4	17.7	4	3.2	30	-0.89	4.8	1	0	1	3
Mean	9.2	15.9	1.3	5.4	32.6	1.2	3.3	1.4	2.4	1.2	6.8

Table 3: *Determinants of the Decision to Invest - Fixed Effect Logit*

Host country FDI restrictions	-0.663*** [0.017]	-0.555*** [0.020]	-0.544*** [0.022]	-0.622*** [0.019]	-0.617*** [0.017]	-0.493*** [0.028]	-0.564*** [0.032]
Host country property rights	0.353*** [0.032]	0.213*** [0.032]	0.361*** [0.031]	0.316*** [0.031]	0.375*** [0.031]	0.276*** [0.033]	0.306*** [0.034]
Host country corporate tax rate	-0.039*** [0.004]	-0.049*** [0.004]	-0.044*** [0.004]	-0.044*** [0.004]	-0.029*** [0.004]	-0.048*** [0.004]	-0.035*** [0.005]
Host country average wage	0.039*** [0.003]	0.027*** [0.003]	0.023*** [0.003]	0.029*** [0.003]	0.036*** [0.003]	0.020*** [0.004]	0.031*** [0.005]
Host country population	1.133*** [0.019]	1.158*** [0.018]	1.128*** [0.018]	1.149*** [0.018]	1.135*** [0.018]	1.137*** [0.018]	1.134*** [0.018]
Transition country dummy	-0.487*** [0.115]	-0.936*** [0.119]	-0.986*** [0.118]	-0.832*** [0.118]	-0.685*** [0.112]	-1.096*** [0.153]	-0.785*** [0.168]
Host country Individual Dismissal Index	0.162*** [0.025]					-0.006 [0.047]	0.050 [0.048]
Host country Severance Index		0.394*** [0.038]				0.293*** [0.044]	0.245*** [0.045]
Host country Collective Dismissal Index			0.171*** [0.018]			0.120*** [0.037]	-0.007 [0.047]
Host country Overall Dismissal Index				0.048*** [0.008]			
Host country GCR Index					0.250*** [0.022]		0.163*** [0.037]
No. of obs.	66,652	66,652	66,652	66,652	66,652	66,652	66,652
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of positive outcomes of the dependent variable	7742	7742	7742	7742	7742	7742	7742

Standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

All regressions contain fixed effect for investing firms.

Table 4: *Determinants of the Investment Volume - Tobit*

Investing firm's size	0.074*** [0.006]	0.074*** [0.006]	0.073*** [0.006]	0.074*** [0.006]	0.073*** [0.006]	0.073*** [0.006]	0.073*** [0.006]
Investing firm's international experience	0.102*** [0.006]	0.100*** [0.006]	0.103*** [0.006]	0.101*** [0.006]	0.103*** [0.006]	0.103*** [0.006]	0.103*** [0.006]
Source country GDP per capita	0.160*** [0.034]	0.160*** [0.034]	0.160*** [0.034]	0.160*** [0.034]	0.161*** [0.034]	0.161*** [0.034]	0.161*** [0.034]
Source country population	-0.013* [0.008]	-0.012 [0.008]	-0.012 [0.008]	-0.012 [0.008]	-0.013* [0.008]	-0.011 [0.008]	-0.011 [0.008]
Host country FDI restrictions	-0.239*** [0.006]	-0.245*** [0.006]	-0.072*** [0.007]	-0.193*** [0.007]	-0.284*** [0.006]	-0.015* [0.009]	-0.074*** [0.010]
Host country property rights	0.048*** [0.010]	-0.015 [0.009]	0.095*** [0.010]	0.019** [0.009]	0.072*** [0.010]	0.059*** [0.009]	0.073*** [0.009]
Host country corporate tax rate	-0.016*** [0.001]	-0.027*** [0.001]	-0.041*** [0.001]	-0.026*** [0.001]	-0.010*** [0.001]	-0.059*** [0.002]	-0.049*** [0.002]
Host country average wage	0.011*** [0.001]	-0.003*** [0.001]	-0.021*** [0.001]	-0.011*** [0.001]	0.003*** [0.001]	-0.044*** [0.002]	-0.040*** [0.002]
Host country population	0.471*** [0.007]	0.491*** [0.007]	0.564*** [0.007]	0.517*** [0.007]	0.480*** [0.007]	0.604*** [0.007]	0.597*** [0.007]
Transition country dummy	-0.033 [0.036]	-0.494*** [0.036]	-1.141*** [0.041]	-0.712*** [0.039]	-0.504*** [0.036]	-1.931*** [0.058]	-1.866*** [0.058]
Host country Individual Dismissal Index	0.230*** [0.011]					-0.316*** [0.018]	-0.308*** [0.018]
Host country Severance Index		0.404*** [0.010]				0.274*** [0.011]	0.275*** [0.011]
Host country Collective Dismissal Index			0.326*** [0.007]			0.451*** [0.013]	0.375*** [0.014]
Host country Overall Dismissal Index				0.101*** [0.003]			
Host country GCR Index					0.300*** [0.008]		0.158*** [0.009]
No. of obs.	49,409	49,409	49,409	49,409	49,409	49,409	49,409
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.



Table 5: *Robustness Checks*

## Panel A - Sub-sample of West European countries - Fixed Effects Logit

Host country Individual Dismissal Index	0.223***				
	[0.026]				
Host country Severance Index		0.737***			
		[0.048]			
Host country Collective Dismissal Index			0.140***		
			[0.018]		
Host country Overall Dismissal Index				0.063***	
				[0.008]	
Host country GCR Index					0.231***
					[0.023]
No. of obs.	48,720	48,720	48,720	48,720	48,720
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00

The explanatory variables (not reported here) include: host country's population, average wage, corporate tax rate, index of property rights and index of restrictions to FDI.

## Panel B - Sub-sample of West European countries - Tobit

Host country Individual Dismissal Index	0.445***				
	[0.013]				
Host country Severance Index		0.415***			
		[0.018]			
Host country Collective Dismissal Index			0.368***		
			[0.010]		
Host country Overall Dismissal Index				0.120***	
				[0.004]	
Host country GCR Index					0.388***
					[0.010]
No. of obs.	36,196	36,196	36,196	36,196	36,196
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00

The explanatory variables (not reported here) include: investing firm's size and international experience, source country's population and GDP per capita, and host country's population, average wage, corporate tax rate, index of property rights and index of restrictions to FDI.

## Panel C - All countries - Dependent variable normalized by the host country GDP - Tobit

Host country Individual Dismissal Index	0.225***				
	[0.011]				
Host country Severance Index		0.574***			
		[0.011]			
Host country Collective Dismissal Index			0.346***		
			[0.008]		
Host country Overall Dismissal Index				0.123***	
				[0.003]	
Host country GCR Index					0.370***
					[0.008]
No. of obs.	49,409	49,409	49,409	49,409	49,409
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00

The explanatory variables (not reported here) include: investing firm's size and international experience, source country's population and GDP per capita, and host country's population, average wage, corporate tax rate, index of property rights and index of restrictions to FDI.

Table 6: *Does Relative Labor Market Flexibility Matter for FDI?*

	Determinants of the decision to invest					Determinants of the investment volume				
	fixed effect logit					Tobit				
Host country FDI restrictions	-0.666***	-0.562***	-0.548***	-0.627***	-0.620***	-0.248***	-0.252***	-0.216***	-0.236***	-0.268***
	[0.017]	[0.020]	[0.022]	[0.019]	[0.018]	[0.006]	[0.006]	[0.007]	[0.006]	[0.006]
Host country property rights	0.361***	0.223***	0.368***	0.323***	0.383***	0.029***	-0.004	0.030***	0.014	0.035***
	[0.032]	[0.032]	[0.031]	[0.031]	[0.031]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]
<u>Difference</u> in corporate tax rates	0.039***	0.049***	0.045***	0.045***	0.029***	0.013***	0.016***	0.016***	0.015***	0.009***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
<u>Difference</u> in average wage rates	-0.040***	-0.027***	-0.024***	-0.030***	-0.036***	-0.011***	-0.004***	-0.004***	-0.004***	-0.008***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Host country population	1.137***	1.162***	1.132***	1.153***	1.138***	0.453***	0.463***	0.461***	0.460***	0.451***
	[0.019]	[0.018]	[0.018]	[0.018]	[0.018]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Transition country dummy	-0.492***	-0.930***	-0.987***	-0.832***	-0.690***	-0.065*	-0.280***	-0.310***	-0.287***	-0.231***
	[0.115]	[0.119]	[0.118]	[0.118]	[0.113]	[0.035]	[0.034]	[0.035]	[0.035]	[0.034]
Investing firm's size						0.079***	0.087***	0.083***	0.089***	0.085***
						[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Investing firm's international experience						0.094***	0.085***	0.088***	0.081***	0.085***
						[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Source country GDP per capita						0.399***	0.488***	0.283***	0.337***	0.313***
						[0.042]	[0.042]	[0.042]	[0.042]	[0.042]
Source country population						0.040***	0.022***	0.039***	0.025***	0.028***
						[0.009]	[0.008]	[0.008]	[0.008]	[0.008]
<u>Difference</u> in Individual Dismissal Index	0.162***					0.112***				
	[0.025]					[0.008]				
<u>Difference</u> in Severance Index		0.379***					0.231***			
		[0.038]					[0.008]			
<u>Difference</u> in Collective Dismissal Index			0.169***					0.071***		
			[0.018]					[0.004]		
<u>Difference</u> in Overall Dismissal Index				0.047***					0.032***	
				[0.008]					[0.002]	
<u>Difference</u> in GCR Index					0.249***					0.119***
					[0.022]					[0.006]
No. of obs.	66,367	66,367	66,367	66,367	66,367	48,984	48,984	48,984	48,984	48,984
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Difference in average wage rates = Wage<sub>source</sub> – Wage<sub>host</sub>

Difference in corporate tax rates = Tax rate<sub>source</sub> – Tax rate<sub>host</sub>

Difference in labor market proxy = Flexibility<sub>host</sub> – Flexibility<sub>source</sub>

Table 7: Interactions with Transition Economy Dummy – Relative Labor Market Flexibility

	Determinants of the decision to invest					Determinants of the investment volume				
	Fixed effect logit					Tobit				
Host country FDI restrictions	-0.666***	-0.537***	-0.547***	-0.626***	-0.619***	-0.249***	-0.248***	-0.219***	-0.241***	-0.264***
	[0.017]	[0.020]	[0.022]	[0.019]	[0.018]	[0.006]	[0.006]	[0.007]	[0.007]	[0.007]
Host country property rights	0.368***	0.192***	0.347***	0.319***	0.383***	0.030***	-0.025**	0.033***	0.016*	0.036***
	[0.033]	[0.033]	[0.032]	[0.031]	[0.031]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]
<u>Difference</u> in corporate tax rates	0.040***	0.052***	0.044***	0.044***	0.029***	0.014***	0.016***	0.016***	0.015***	0.009***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
<u>Difference</u> in average wage rates	-0.039***	-0.025***	-0.025***	-0.030***	-0.036***	-0.011***	-0.002**	-0.003***	-0.003***	-0.008***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Host country population	1.134***	1.170***	1.145***	1.154***	1.138***	0.452***	0.466***	0.456***	0.457***	0.452***
	[0.019]	[0.018]	[0.019]	[0.018]	[0.018]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Transition country dummy (TE)	-0.493***	-1.468***	-0.973***	-0.809***	-0.683***	-0.068**	-0.447***	-0.332***	-0.351***	-0.224***
	[0.115]	[0.144]	[0.119]	[0.121]	[0.115]	[0.035]	[0.041]	[0.036]	[0.037]	[0.034]
Investing firm's size						0.079***	0.090***	0.087***	0.083***	0.085***
						[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Investing firm's international experience						0.094***	0.080***	0.085***	0.088***	0.086***
						[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Source country GDP per capita						0.400***	0.470***	0.272***	0.320***	0.309***
						[0.042]	[0.042]	[0.042]	[0.042]	[0.042]
Source country population						0.040***	0.020**	0.037***	0.024***	0.028***
						[0.009]	[0.008]	[0.008]	[0.008]	[0.008]
<u>Difference</u> in Individual Dismissal Index	0.165***					0.119***				
	[0.025]					[0.009]				
<u>Difference</u> in Individual Dismissal Index*TE	-0.068					-0.030*				
	[0.072]					[0.018]				
<u>Difference</u> in Severance Index		0.457***				0.274***				
		[0.040]				[0.010]				
<u>Difference</u> in Severance Index*TE		-0.614***				-0.136***				
		[0.089]				[0.019]				
<u>Difference</u> in Collective Dismissal Index			0.155***					0.079***		
			[0.018]					[0.004]		
<u>Difference</u> in Collective Dismissal Index*TE			0.213***					-0.026***		
			[0.034]					[0.008]		
<u>Difference</u> in Overall Dismissal Index				0.046***					0.038***	
				[0.008]					[0.002]	
<u>Difference</u> in Overall Dismissal Index*TE				0.018					-0.023***	
				[0.019]					[0.004]	
<u>Difference</u> in GCR Index					0.251***					0.131***
					[0.022]					[0.006]
<u>Difference</u> in GCR Index*TE					-0.014					-0.048***
					[0.045]					[0.012]
No. of obs.	66,367	66,367	66,367	66,367	66,367	48,984	48,984	48,984	48,984	48,984
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Difference in average wage rates = Wage<sub>source</sub> – Wage<sub>host</sub>

Difference in corporate tax rates = Tax rate<sub>source</sub> – Tax rate<sub>host</sub>

Difference in labor market proxy = Flexibility<sub>host</sub> – Flexibility<sub>source</sub>

Table 8. Is FDI in Services Sectors More Sensitive to Labor Market Flexibility?

	Determinants of the Decision to Invest					Determinants of the Investment Volume				
	Fixed effect logit					Tobit				
Host country FDI restrictions	-0.665***	-0.555***	-0.546***	-0.624***	-0.617***	-0.248***	-0.252***	-0.215***	-0.235***	-0.268***
	[0.017]	[0.020]	[0.022]	[0.019]	[0.018]	[0.006]	[0.006]	[0.007]	[0.006]	[0.006]
Host country property rights	0.360***	0.223***	0.368***	0.326***	0.380***	0.029***	-0.004	0.030***	0.014	0.035***
	[0.032]	[0.032]	[0.031]	[0.031]	[0.031]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]
<u>Difference</u> in corporate tax rates	0.039***	0.049***	0.044***	0.044***	0.028***	0.013***	0.016***	0.016***	0.015***	0.009***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
<u>Difference</u> in average wage rates	-0.040***	-0.028***	-0.024***	-0.030***	-0.036***	-0.011***	-0.004***	-0.004***	-0.004***	-0.008***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Host country population	1.136***	1.160***	1.129***	1.151***	1.137***	0.453***	0.463***	0.462***	0.461***	0.451***
	[0.019]	[0.018]	[0.018]	[0.018]	[0.018]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Transition country dummy	-0.494***	-0.922***	-0.964***	-0.811***	-0.675***	-0.063*	-0.278***	-0.309***	-0.285***	-0.232***
	[0.115]	[0.119]	[0.119]	[0.118]	[0.113]	[0.035]	[0.034]	[0.035]	[0.035]	[0.034]
Investing firm's size						0.079***	0.090***	0.087***	0.084***	0.085***
						[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Investing firm's international experience						0.093***	0.084***	0.087***	0.080***	0.085***
						[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Source country GDP per capita						0.399***	0.486***	0.281***	0.335***	0.313***
						[0.042]	[0.042]	[0.042]	[0.042]	[0.042]
Source country population						0.041***	0.023***	0.041***	0.027***	0.028***
						[0.009]	[0.008]	[0.008]	[0.008]	[0.008]
<u>Difference</u> in Individual Dismissal Index	0.005					0.073***				
	[0.046]					[0.015]				
<u>Difference</u> in Individual Dismissal Index*Services	0.211***					0.053***				
	[0.053]					[0.017]				
<u>Difference</u> in Severance Index		0.113*					0.195***			
		[0.059]					[0.015]			
<u>Difference</u> in Severance Index*Services		0.370***					0.047***			
		[0.063]					[0.016]			
<u>Difference</u> in Collective Dismissal Index			0.055**					0.049***		
			[0.028]					[0.007]		
<u>Difference</u> in Collective Dismissal Index*Services			0.152***					0.029***		
			[0.028]					[0.008]		
<u>Difference</u> in Overall Dismissal Index				-0.010					0.021***	
				[0.014]					[0.004]	
<u>Difference</u> in Overall Dismissal Index*Services				0.075***					0.015***	
				[0.015]					[0.004]	
<u>Difference</u> in GCR Index					0.060					0.087***
					[0.039]					[0.010]
<u>Difference</u> in GCR Index *Services					0.255***					0.043***
					[0.043]					[0.012]
No. of obs.	66,310	66,310	66,310	66,310	66,310	48,953	48,953	48,953	48,953	48,953
Prob>Chi <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Difference in average wage rates = Wage<sub>source</sub> – Wage<sub>host</sub>

Difference in corporate tax rates = Tax rate<sub>source</sub> – Tax rate<sub>host</sub>

Difference in labor market proxy = Flexibility<sub>host</sub> – Flexibility<sub>source</sub>

# Do Payroll Tax Breaks Stimulate Formality?

## Evidence from Colombia's Reform

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### Abstract

Alternative work arrangements have grown rapidly around the world. In Latin America, these alternative work arrangements have long been part of the labor market and have continued to grow. The informal sector grew rapidly in Latin America over the past few decades comprising up to half of the working population in many countries. Some attribute the growth in alternative work arrangements and informality to regulations and taxes, while others argue that it is precisely the lack of enforcement of regulations that allows unprotected employment arrangements to flourish. We examine whether reducing taxes associated with employment stimulates formal sector employment. We exploit the fact that the Tax Reform introduced in Colombia in 2012 affected only certain types of workers and not others. In particular, workers earning less than 10 minimum wages (MW) and self-employed workers with more than 2 employees experienced a reduction of payroll taxes of 13.5% between 2013 and 2014. We use the Colombian Household Surveys, Social Security records and the Monthly Manufacturing Sample to conduct difference-in-difference analyses of the reform. We find evidence of increased formal employment for the affected groups after the reform using all three datasets. We find that the probability of formal employment and the likelihood of transitioning into registered employment increased for the affected groups after the reform. We also find that the level and share of permanent employment relative to temporary employment grew after the reform for those earnings less than 10 MW. The results are greatest for those in smaller firms and for those earnings close to the MW.

**JEL Codes:** H2, J2, J24, and J31.

**Keywords:** Payroll taxes, Informality, Tax reform, Permanent employment.

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## 1. Introduction

Latin America and other developing regions depend on payroll taxes to finance pensions, disability and maternity benefits, and worker's compensation for those suffering from workplace injuries. In the case of Colombia, payroll taxes are also used to finance the National Vocational Training Service (*Servicio Nacional de Aprendizaje*, SENA, in Spanish) and the Colombian Institute for Family Welfare (*Instituto Colombiano de Bienestar Familiar*, ICBF, in Spanish). Until very recently, mandatory contributions in Colombia were close to the European median, where the payroll tax rate was about 40 percent (Gill et al., 2005). However, payroll contributions are much higher compared to countries with relatively less regulated labor markets, such as the United Kingdom and the United States, where contributions have fluctuated between 15 and 20 percent of total compensation (OECD, 2015).

In Latin America and continental Europe, high payroll taxes increase the labor costs that companies have to pay, thus discouraging companies from hiring workers. Nonetheless, from a theoretical perspective, the impact of payroll taxes on the labor market is ambiguous. On one hand, when workers value the benefits paid for with payroll taxes as much as the amount they contribute, increases in payroll taxes should be fully passed through from companies to employees in the form of lower salaries, with a neutral effect on unemployment. Consequently, in this case, employers would not experience increases in their overall labor costs. On the other hand, if wages are not fully flexible or if payroll taxes fund services that do not directly benefit all employees (such as SENA or ICBF), then wages would not absorb the total payroll taxes as lower wages and there would be an increase in labor costs and a reduction in employment.

Empirical studies from various countries show mixed evidence regarding the impact of payroll taxes on employment and wages. For instance, Gruber and Krueger (1991) and Gruber

(1994) find neutral effects on employment in the United States (i.e., full pass-through of taxes onto wages). Gordon (1972) also finds full pass-through taxes onto wages and no impact on employment in the United States. Nevertheless, Vroman (1974) and Harmermesh (1979) find that there is partial pass-through with non-neutral effects on wages and employment. Kaestner (1996) finds that there is no pass-through from payroll taxes onto wages for young workers in the United States.

In most Latin American countries, minimum wages are relatively high and constitute a binding restriction on formal sector employment (see, for example, Maloney et al., 2004). As a result, in this context, it is not feasible to pass-through higher payroll taxes to employees as lower wages, so it is more likely that increases in payroll taxes reduce formal employment. Gruber (1997) finds that a reduction in payroll taxes is completely passed-through to employees in the form of higher wages, without an impact on employment, in Chile. By contrast, Kugler and Kugler (2009) find that a 10 percent increase in payroll taxes reduces manufacturing employment by five percent among the least skilled workers. In this context, the increase in payroll taxes was not transferred to employees through lower wages. This finding is consistent with evidence provided by Maloney et al. (2004) that the minimum wage was binding in Colombia at the time.

In the current study, we explore the effects of the recent drop in the payroll tax rate associated with the Tax Reform, Law 1607, implemented at the end of 2012. The goal of this reform was to increase employment and, in particular, formal employment. As a result, in this study we focus on evaluating the impact of the reform on formal employment. Although the effects of changes in payroll taxes have already been studied in the Colombian context, it is important to study the effects of this particular reform for two reasons. First, the effects of changes in payroll taxes are likely to be asymmetric depending on whether there is a hike or a

decline. Due to a binding minimum wage, it is more feasible for a reduction in payroll taxes to be passed-through to employees as higher wages than for an increase in payroll taxes to be passed through to employees as lower wages. On the other hand, changes in the tax rate would have larger effects on employment if the taxes were used to finance services that do not directly benefit contributors and that, as a result, cannot be passed-through to workers' wages.

In Colombia, the link between benefits and contributions was relatively weak before the introduction of Law 1607. This made workers less willing to accept the lower wages offered by employers in response to increases in non-wage labor costs. As Kugler and Kugler (2009) show this implies that there is less formal employment and, consequently, it becomes harder to find a formal sector job. Kugler and Kugler (2009) provide evidence that reductions in payroll taxes – often proposed to stimulate demand for low-wage labor – are an effective measure to reduce unemployment and informality among young and low-skilled workers, especially if the tax cuts are focused on indirect benefits (like SENA and ICBF).

The analysis in this paper examines the effects of Law 1607, which reduced payroll taxes for those with less than 10 minimum wages and for self-employed who hired two employees or more. These are the two groups that qualify for payroll tax reductions under the reform. The analysis exploits the fact that specific groups of employers and employees were affected by the reform to estimate the impact of the reduction in the payroll tax using a quasi-experimental evaluation design. The analysis consists of comparisons of the following two pairs of groups: (i) workers with fewer and more than 10 minimum wages, before and after the reform; and (ii) self-employed workers with two or more employees, and others who either are not self-employed or who are self-employed but hire fewer than two employees, before and after the reform.

Our analysis uses three different data sets to examine the effects of the reform. In particular, we analyzed data from: the Household Surveys collected by the Colombian National Department of Statistics (*Gran Encuesta Integrada de Hogares* or GEIH, in Spanish), administrative data from the Social Security System (*Planilla Integrada de Liquidación de Aportes* or PILA, in Spanish), and survey data from the Monthly Manufacturing Sample (MMS). The data from the Household Surveys and from the Social Security records enable us to examine individual-level data to analyze effects on levels and transitions to the formal sector. The data from the MMS allow us to examine the effects of the reform on permanent employment at the establishment-level.

The results from the three data sets consistently show positive effects of the reform on formal employment. The results from the Household Surveys show an increase of 6 percentage points or a 9.5% increase in the probability of having a signed contract, and an increase of 6.8 percentage points or a 10% increase in the probability of contributing to the pension and/or health schemes for those with less than 10 minimum wages after the reform. The effects are bigger among smaller companies. Likewise, the results using Social Security records show an increase of 3.5 percentage points or 15.2% in the probability of going from informality or unemployment to formality for those paid under 10 minimum wages after the reform.

The results also show small positive effects for self-employed workers with more than three employees using both the Household Survey and Social Security data. The probability of employment and of transitioning to a job with health benefits and/or pensions increases by two and sixteen percentage points after the reform for self-employed workers with more than three employees.

The results using the Manufacturing Sample also show that the reform increased permanent employment in the manufacturing sector. The evidence shows that manufacturing establishments that pay less than 10 minimum wages on average increase their number of permanent employees by 46 workers. They also show that the percentage of permanent workers employed by those establishments increased by 10% following the reform. In general, the reform is associated with an increase in formal employment for individuals and for companies with less than 10 minimum wages after the reform. The effects are robust to different specifications and are greater among smaller companies.

## **2. Changes in the Structure of Payroll Taxes**

In 2012, Colombia introduced important legislative changes to reduce payroll taxes. The most important reform in changing payroll taxes since the reforms of the 1990s was the introduction of Law 1607. This reform reduced payroll taxes for workers with low wages, who *a priori* should have experienced greater distortions and had fewer formal job opportunities due to the higher labor costs before the reform. Payroll taxes were 29.5% in 2012, they fell to 24.5% in 2013 and reached 16% in 2014, after the tax reform was fully implemented.

A couple of years before, in 2010, the First Employment Law reduced effective payroll taxes, by allowing companies to deduct them from their income tax, for employers hiring young workers and others entering the labor force. As a result, in this analysis we try to distinguish the First Employment Law effects from those of the more expansive reforms introduced by Law 1607.

## 2.1. Law 1607 of 2013

The tax reform introduced with Law 1607 included exemptions to employer payroll taxes used to finance training programs, family and childcare programs, and compulsory health benefits. While Congress ratified the law in 2012, the exemptions were only first granted on May 1<sup>st</sup>, 2013 for contributions going to training programs (SENA, 2%) and family and childcare programs (ICBF, 3%), for a total exemption of 5% in payroll taxes. Importantly, those who contribute payroll taxes to these programs typically use neither training nor family and childcare programs. This means that the link between the benefits and contributions to the programs is weak. Beginning on January 1<sup>st</sup>, 2014, the exemptions were also applied to employer contributions to the Contributory Health Scheme (of 8.5%), first introduced in 1993 by article 204 of Law 100. In our analysis, we evaluate the differential impact on formal employment for workers exempted and not exempted from these taxes by the new law starting in 2013.

According to Law 1607, issued by decree 862 in April 26, 2013, the exemption on payroll taxes applies to two groups of individuals. First, it applies to all legal, contributing for profit entities paying taxes and that have in their payroll workers who individually accrue fewer than ten (10) monthly, legal, minimum wages. Second, it applied to all self-employed individuals who employ two or more workers. The law also indicates those individuals who do no benefit from the exemptions. Importantly, it includes all employees who earn more than 10 minimum wages and self-employed individuals who employ fewer than two employees.<sup>1</sup>

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<sup>1</sup> Others excluded from the exemptions are legal entities that do not pay income taxes, such as unions, community action boards, horizontal joint ownership boards, those listed in articles 22, 23, 23-1, and 23-2 of the National Tax Code, legal non-profit entities, such as cooperatives, employee funds, associations, corporations, and foundations. Also excluded are those operating in Free Tax Zones established by 2012 or with pending applications at that time as well as users of previous Free Tax Zones that have qualified or could qualify in the future to these zones and that are subject to the special income tax rate of 15% established by the first subsection of article 240-1 of the National Tax Code.

At the same time, the Colombian government introduced its Plan to Increase Productivity and Employment or PIPE program (*Plan de Impulso a la Productividad y el Empleo* in Spanish), which intended to replace the revenues lost from the exemptions for SENA, ICBF and public health insurance through other sources of funding. To offset the revenue losses from the exemptions, the tax reform included an equity income tax or CREE (*Impuesto sobre la Renta para la Equidad* in Spanish). The CREE rate was 9% starting in 2013. In 2015, the CREE increased by an additional 5%, which has continued to increase by 1% every year until 2018.

The CREE percentage was distributed as follows: 1.4 percentage points go to SENA, 2.2 percentage points go to ICBF, and 4.4 percentage points go to the social security health scheme. The additional 1.2 percentage point charged during the first three years was devoted to financing public institutions of higher education (40%), the subsidized health scheme (30%), and social investments in the agricultural sector (30%). Importantly, the equity income tax is levied on profits and, thus, tends to affect the most profitable firms, which are also the largest firms.

In conclusion, beneficiaries of the payroll tax exemptions instituted by Law 1607 from 2012 are CREE contributors who hire workers with less than 10 minimum wages and self-employed individuals who hire two or more workers. The reduction of the employer payroll tax rates for SENA and ICBF by 5% and of health contributions by 8.5% introduced by the reform intends to not only reduce informal employment, but also to generate new formal jobs. The reason why employment creation in the formal sector would be incentivized is that payroll taxes, which are associated with formal employment, would fall. Even though the equity income tax was introduced, this tax is on profits and not associated with employment, thus, de-linking the new taxes from the costs associated with formal job creation.

## 2.2. Law 1429 from 2010

Before the implementation of the Tax Reform, the First Employment Law was introduced in 2010. This reform also reduced the effective labor costs generated by payroll taxes to certain types of recently hired workers. The First Employment Law allows companies to deduct from their income tax contributions the payroll tax payments destined to finance services not directly benefiting all their employees, including tax contributions to finance SENA, ICBF, as well as contributions to the Solidarity Guarantee Fund or FOSYGA (*Fondo de Solidaridad y Garantías* in Spanish), which subsidizes health services for the poorest, and the contributions to the Minimum Pension Guarantee Fund or SGP (*Sistema General de Pensiones* in Spanish) which subsidizes pensions for the poorest.<sup>2</sup> Although this law also covered pensions, the First Employment Law is more limited in the number of individuals to which it applies relative to the payroll tax reform. This is because it is only valid for new hires who are: young workers, women over 40, and earning less than 1.5 times the minimum wage, as opposed to the 10 minimum wage threshold in the 2012 tax reform.

In addition, the benefits only apply to new workers. The law defines new workers as those who appear for the first time in the administrative social security records, or those who were previously in the system identified as self-employed workers. This prevents companies from trying to claim exemptions for workers who are laid-off and rehired or new hires that are simply replacing previously hired workers.

To benefit from the deductions of Law 1429, employers must also fulfill the following requirements established by the law. Companies have to be formally registered and have to hire

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<sup>2</sup> These deductions applied to companies that hired: workers younger than 28 years of age; female heads of households; individuals who have been displaced or are in the process of reintegration; individuals who are disabled; women older than 40 years of age, and workers earning less than 1.5 minimum wages.

the type of workers described by the law. Also, they have to increase their payrolls and not replace old personnel. That is, the number of employees must increase relative to the number of employees that were contributing in the previous year, and the total value of payroll must increase by the month of December of the previous year in which the discounts are applied.

In the empirical analysis presented in this paper, we will focus on the impacts of the Tax Reform (Law 1607) by exploiting the fact that the reform covered certain groups but not others. Moreover, we will attempt to disentangle the effects of the tax reform from those of the First Employment Law (Law 1429) since the latter preceded the tax reform and some of the coverage may have overlapped.

### **3. Data**

#### **3.1. Household Surveys**

Colombia collects cross-sectional data on labor force participation, earnings, and quality of life indicators of households since the 1960s. However, since the start of this data collection process and up to 2006, data were only available for 13 cities and their metropolitan areas. Starting in 2006, the entire survey covers 24 cities and their metropolitan areas. In addition, the modules on labor markets and household earnings also cover rural sectors.

The purpose of this data collection effort is to provide information about the size and structure of the labor force (employed, unemployed, and inactive) as well as of socio-demographic characteristics of the population. Consequently, the Household Surveys allow to classify the population according to the concepts detailed by the International Conference of Labor Statisticians (CIET, in Spanish); to calculate the main labor market indicators (participation rate, occupation rate, unemployment rate, etc.); to measure general population characteristics (characteristics of dwellings, access to public services); to obtain socio-demographic information

from the population (sex, schooling levels, civil status, etc.), and to measure employment characteristics, among others.

The existing database is the result of a probabilistic sampling of several stages, stratified by unequal conglomerates, and weighed for the 24 capital cities and their metropolitan areas. The universe is the entire civilian, non-institutionalized population residing in Colombia. The sampling unit is a segment of 10 contiguous households. The sample size is 20,669 households. The sampling error is no greater than 5% and possesses national coverage, including differentiation by zone, department, and large regions. Data were collected weekly for big cities and monthly for capital cities.

In order to construct the treatment group that was exempt because they earned less than 10 times the minimum wage, we calculated a variable called Times Minimum Wage (MW) as the ratio of nominal yearly earnings to the yearly minimum wage (515,000 Colombian pesos for 2010; 535,600 Colombian pesos for 2011; 566,700 Colombian pesos for 2012; and 589,500 Colombian pesos for 2013). We, then, used this variable to construct a dummy for 10 times the MW. We also constructed variables for self-employment, employers, and contract type for wage earners. We also construct firm size variables that identify if firms are less than 3 employees; between 4 and 10; between 10 and 50, and more than 50 employees. This allows us to construct an indicator for the second treatment group by interacting the self-employment dummy with the less than 3 employee dummy. We also created an indicator for 2013 to capture the effects of the reform by interacting the post-reform period with the indicators of whether workers earned less than 10 times the MW and whether they were self-employed and hired at least two employees.

For the dependent variables, we constructed several measures of formality. In particular, we constructed five different measures of formality: an indicator that takes the value of 1 if the

employee has a written contract and zero otherwise; an indicator that takes the value of 1 if the employer or employee contributed to social security and zero otherwise; an indicators that take the value of 1 if the employer or employee contributed either to the health system, pensions, and workers' compensation and zero otherwise.

Among the control variables, we include data on socio-economic factors about individuals, such as age, age squared, marital status, whether the person is literate (i.e., can read and write), years of schooling, department dummies, and year dummies among others.

Finally, to corroborate the robustness of the results, we create additional variables to generate placebos by replacing some criteria, and controls for the First Employment Law. In particular, we generated a variable for fewer than 20 MW, as well as variables for individuals younger than 29 years of age, women older than 40 years, and for individuals with salaries below 1.5 MW in order to control for the First Employment Law.

Table 1 shows different measures of formality for the years from 2010 to 2013. The table shows that formality has increased over time, regardless of the measure used. For example, the proportion of people who contribute to health or pension schemes or both increased from 67.7% in 2010 to 70.7% in 2013. Similarly, the proportion of people contributing to workers compensation increased from 59.2% in 2010 to 64.5% in 2013. The proportion of individuals with a written contract from 63.5% in 2010, to 66.1% in 2013. The coverage of the reform was broad, since 99.6% of workers in 2012 (the year that the reform was approved) earned less than 10 MW. Also, 16.2% of individuals were self-employed workers and 11.1% were self-employed with more than 3 employees in 2012. Finally, about half of the individuals in the sample, 50.8%, are men; about 23.2%, are married; 52.8%, have a high school degree while a minority of them has no high school in 2013.

Table 2 presents results from simple correlations between the Less than 10 MW dummy with the various measures of formality as well as individual characteristics. The table shows that those with less than 10 MW are less likely to have written contract, to have their employer make contributions to the health system and/or to a pension fund, and to have their employer make contributions to workers' compensation. This is contrary the effect we find below of a positive effect on formality after the introduction of the reform. The table also shows that those with less than 10 MW are more likely to be women, are more likely to be employed in smaller firms, and are less likely to be married. Those with less than 10 MW are also more likely to illiterate, to be high school drop outs, to be high school graduates, and to have degree a from a training college but less likely to have a University degree. This is why, below, we control for all of these characteristics in the estimations below.

### **3.2. Social Security Administrative Records**

The social security records come from the PILA, which is the data that integrates all the payroll contributions made by workers. These records contain contributors' reported information for each of the funds in which workers are required to contribute. It is the responsibility of the contributor to provide information in order for the contributions to be paid by the Social Security System.

The PILA database analyzed in this study has around 1.25 billion registries that reflect the tracking of 16.8 million individuals over 7 years (from 2008 through 2014). The data has no defined periodicity, since they are based on the contribution reports to the health and pension systems made by individuals at any point in time during the period from 2008-14. This means that a person may register more than one monthly payment to the same fund and that the number of days quoted in a month can be greater than the duration of the month.

For this analysis, we consolidated all the payment reports and quoted days for each fund in each month. The total monthly income was converted to constant December 2014 prices using the monthly inflation rate for each state.<sup>3</sup> This was then used to estimate the number of times a person earns the minimum wage. In addition, the database contains reports from the contributing company and reports related to employees. Using this code, we added individuals who reported monthly for one company and used this to infer the firm size. The database has no information regarding date of birth or age for individuals before 2014, so we did not consider these characteristics. The control variables were constructed for each month, year, type of industry, and state.

We consider workers who have a payment report as being in the formal labor market at that moment in time. Thus, we estimate transitions from non-employment to formal or registered employment as those in which an individual was not in the system the previous month and then appears as contributing into the system the next month. The results of contributions to the health and pension funds are very similar, but there is a possibility of registering payments to the health scheme without actually working. For this reason, we rely only on registries into the pension funds to identify transitions into formal employment.<sup>4</sup>

The analysis includes an unbalanced panel by individual year-month. Consequently, some of the controls in later periods do not contain any information. These are considered as additional categories in the fixed effects.

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<sup>3</sup> There are 33 states or geographic units in Colombia. These geographic units include 26 departments, the capital city, the islands of San Andres and Providencia, and 5 territories.

<sup>4</sup> We use a randomized sample of 25% from the universe of individuals in social security records for all of our estimations. We restricted our estimations to the 25% sample due to the long computation time associated with processing the full sample.

Table 3 shows the descriptive statistics for the PILA database for the entire sample used in the analysis and by company size. The proportion of employees transitioning from outside the labor force, unemployment, or informality towards formality or the fraction of individuals who enter into registered employment is, on average, about 23% per month. The average size of registered companies in the PILA database is of 840 employees.

### **3.3. The Monthly Manufacturing Sample**

The Monthly Manufacturing Sample (MMS) includes data on employment, wages, production, and characteristics of establishments in the manufacturing sector, i.e., those with Industry Code CIIU Rev. 3.<sup>5</sup> The data of the MMS are used to detect changes that could occur in the manufacturing sector in the short-term, including changes in employment, wages, hours worked, production, and sales of Colombian manufacturing establishments. At the same time, the sample allows to determine the performance of the sector in different industrial activities; to determine the size and evolution of different sectors; to create competitiveness indices; to analyze the impact of the economic dynamics on the productive sector; and to construct an index to temporarily estimate GDP.

The accountant, manager, owner, or the person in charge of accounting matters in the establishment provides information on the establishment to DANE (the National Administrative Statistics Department). The MMS uses as sampling, observation, and analysis unit the industrial establishment and it is part of the Annual Manufacturing Sample with a 5% error rate at the national level. It includes stratified probabilistic sampling (although random for each stratum),

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<sup>5</sup> This dataset dates back to May 1962, when the country started compiling industrial sampling data in order to build employment and wage indicators. In parallel, the country also collected data on industrial production, an effort that was stopped in 1970 when the data collection process was unified under a single system, using industrial codes based on ISIC Rev. 1. This design was in use until 1980. In 1978, the design of the sample was modified to comply with the adoption of new industrial codes, ISIC Rev. 2. This design was maintained until 1990. Towards the end of the 1990s and the beginning of the 21<sup>st</sup> century, the current design of the MMS was adopted to include changes in the representativeness of the sample and to include a third revision of the ISIC industrial codes.

and stratification is done by production, personnel, and type of industry. The compilation of the information is performed within the first 20 days of each month.

These data are subject to confidentiality restrictions and statistical reserve. Although we had access to the data through DANE's computers, it is not possible to get access to these data outside of the country. For this reason, the descriptive information we obtained from the database is limited. One of the reasons for such confidentiality is a company that meets certain characteristics (for instance, size, production, and type of industry) may be the only company in a region and, as a result, confidentiality would be lost. Confidentiality is one of the main agreements with the companies providing information.

In this study, we use the MMS to examine the impacts of the reform on employment and hours worked of different types of workers in the manufacturing sector. The data to which we had access has about 120,770 entries (about 16,400 annual entries). The database we used had information on the establishment characteristics previously mentioned as well as monthly temporary jobs from January 2007 through April 2014. Even though there is an identifying number that may seem unique, it is not possible to do a panel-like tracking because often times the response of each unit is voluntary and it is sometimes forcefully imputed because of probabilistic matters.

We constructed several variables with the MMS for analysis. Unlike the Household Surveys and the Social Security data, the MMS does not have individual level wages. We can, however, estimate the ratio of the average wage in the establishment to the MW of 515,000 in 2010 Colombian pesos. Then, we estimate a dummy variable for establishments whose average wages are less than 10 times the MW to identify establishments in which employees are most likely affected by the payroll tax reform. Our outcomes are the total number of the total number of

production and non-production permanent employees and the proportion of permanent production and non-production workers out of the total number of employees (both permanent and temporary).

The idea is that permanent employment should increase both in levels and as a proportion of total employment, since payroll taxes are required for permanent workers but largely exempt temporary workers.<sup>6</sup> We also examine the impact of the reform on the number of hours worked by permanent employees. Since the fixed cost of hiring a permanent worker goes down, employers should now prefer hiring more permanent workers and reducing their hours worked. We also construct a placebo of fewer than 20 MW, to check that our results are driven by the reform and not by some other factor that affects firms paying lower wages.<sup>7</sup>

Table 4 shows descriptive statistics for the MMS data. The average share of permanent non-production and permanent production employees in the sample are 52.2% and 99.5%, respectively. The average number of yearly regular and extraordinary hours worked for permanent non-production employees are 19,587 and 1,725, respectively.

Figure 1 shows the distribution of establishments by state. The vast majority of manufacturing establishments are in Bogota, Antioquia, and el Valle; the rest of the establishments are distributed throughout the country. Bogota, the capital of Colombia, has 32.9% of the establishments and 7.3% are located in the state of Cundinamarca (a state right next to Bogota); 21.4% are in the state of Antioquia; 12.8% are in the state of Valle; 6.3% are in the state of Atlantic (in the Caribbean coast) and 3.4% are in the state of Santander. The rest are distributed

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<sup>6</sup> Temporary workers mostly operate under the modality of “prestación de servicios” (provision of service contracts). Under these contracts, temporary workers are hired without benefits and are not employees as such. They get their own healthcare and have to set aside 13% for income taxes to pay the “retención en la fuente” tax.

<sup>7</sup> The share with earnings above 10 MW is 0.8 percent and of those one quarter earn over 20 MW, after applying expansion factors to the sample.

throughout the country with no more than 2.5% of the establishments located in any one of the other states.

#### 4. Empirical Evidence

We explore empirically whether the reduction of payroll taxes and restructuring of taxes generated incentives to create formal jobs. We also evaluate if the reform increases employment at the extensive margin (number of employees) and reduced employment at the intensive margin (number of hours) using data at the individual-, household- and establishment-level. We use the Colombian Household Surveys, Social Security records and the Monthly Manufacturing Sample to conduct difference-in-difference (DiD) analyses of the reform.

##### 4.1 Results from the Household Surveys

We estimate the following model to calculate the probability of having a formal job using data from the Household Surveys:

$$P(F_{it}) = bX_{it} + l_s + f_r + \tau_t + \delta_0 \text{Less 10 MW}_{it} + \delta_1 \text{Post}_t \times \text{Less 10 MW}_{it} + \delta_2 \text{Post}_t \times \text{Self-Employed\_More 3 Employees}_{it} + u_{it}$$

where  $P(F_{it})$  is the probability of having formal employment and where formal employment is equal to one if the individual has a formal job defined as: (a) having a written contract, (b) the individual or employer pays for health benefits, (c) the individual or employer contributes to a pension fund, (d) the individual or employer contributes to a health and/or pension scheme, or (e) the individual or employer pays for workers' compensation.  $\text{Less 10 MW}_{it}$  is a dummy variable that equals one if the person receives fewer than 10 minimum wages (10 MW).  $\text{Self-Employed\_More 3 Employees}_{it}$  is an indicator that equals one if the employee is self-employed and hires

three or more workers.<sup>8</sup>  $Post_t$  is an indicator for whether the person is observed after 2013. Thus, the coefficients on the interaction terms,  $\delta_1$  and  $\delta_2$ , capture the effects of the reform on formal employment.  $X_{it}$  is a vector of controls that includes characteristics such as age, marital status, gender, schooling level, firm size, and an indicator for whether the employee is self-employed or not as well as interactions between this last indicator with firm size.<sup>9</sup> The sectorial, geographic, and temporal effects are captured by  $l_s$ ,  $f_r$  and  $\tau_t$ , respectively. We cluster standard errors by state.<sup>10</sup>

Table 5 reports coefficients  $\delta_1$  and  $\delta_2$ , which capture the effects of the individuals with fewer than 10 minimum wages and on self-employed with more than 3 employees.<sup>11</sup> The results show that the reform generated an increase in the probability of having formal employment. Specifically, the probability of having a written contract after the reform is 6 percentage points greater for employees with wages less than 10 MW. The probability of contributing to health benefits is 6.2 percentage points higher. The probability of contributing to a pension scheme increased by 6.9 percentage points and the probability of contributing to a health and/or pension system increases by 6.8 percentage points for workers with fewer than ten MW after the reform. Finally, the probability of contributing to workers' compensation increases by 5.7 percentage points. These coefficients are robust and are significant even with clustered standard errors. To

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<sup>8</sup> Note that the data does not allow distinguishing 2 or more employees, so we construct a variable for three or more employees.

<sup>9</sup> Our treatment group is composed of workers earning below 10 MW and the comparison group of those with earnings above the 10 MW threshold. Since a potential concern is baseline unbalance among individuals in each group, we control for possible baseline differences in education, experience, age, race and gender, among others.

<sup>10</sup> Another potential concern is that lower wage individuals, say those earning above but close to the minimum wage may be more prone to transitioning into and out of formal employment. To explore that issue, Figure 2 presents the probability of formal employment (defined as contributing to health or pensions) as a function of the fraction of wages out of the MW in 2010. We find that this plot is roughly flat (except at low multiples of the MW), implying that the probability of being formal is not directly related to wages as multiples of the MW. Below, we perform robustness tests by leaving out of the control group those wages very close to the MW.

<sup>11</sup> As a baseline, we separate out the impact of lower payroll taxes, by first estimating a simple DiD design including only wage earners (comparing those above and below the 10 MW threshold) and then individually estimating the effect on self-employed individuals (by comparing those above and below the two workers threshold).

understand the magnitude of these effects, we estimated the elasticity of employment with respect to non-wage labor costs. The effects translate into elasticities of 0.2 and 0.22 for the effects regarding written contracts and jobs that contribute to health or pensions. These effects are in line with the effects at the lower end of the range of 0.15-0.75 reported by Hamermesh (1996).

Table 5 also reports coefficients of the post-reform indicator interacted with the indicator for self-employed workers with 3 or more employees. The results show that the probability to pay for health benefits or a pension fund increases by 1.6 and 2 percentage point among self-employed workers with more than two employees after the reform. This effect translates into an elasticity of employment of 0.07, which is about a third of the elasticity we calculated for workers with less than 10 minimum wages.<sup>12</sup>

When the effects are estimated separately for men and women, we continue to find effects for those with less than 10 minimum wages as well as effects for the self-employed with more than 3 employees for both men and women. Panel B of Table 5 shows the effects for women and Panel C for men. The results for those earnings less than 10 MW are greater for women and they are observed across all measures of formality. For example, the probability of having a written contract increases to 12.3 percentage points while the probability of contributing to either health or pension benefits increases to 10.5 percentage points for women earning more than 10 MW after the reform, which correspond to elasticities of 0.42 and 0.34 respectively. The results in Panel C shows equivalent effects on these measures of formality of 2.9 and 4.4 percentage points for men,

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<sup>12</sup> We have also estimated the impact of the effects in separate regressions when we only include the interaction of Less than 10 MW with the reform dummy and when we only include the interaction of Self-employed with More than 3 Workers with the reform dummy. These results are reported in Appendix Tables 1 and 2. The regressions reported in Appendix Table 1 for those with Less than 10 MW are estimated only for those with positive earnings. The regressions reported in Appendix Table 2 for the Self-Employed with More than 3 Workers are estimated only for the self-employed. Since the two variables were shown not to be correlated in Table 2, it is not surprising that the results are very similar to those reported in Table 5 when both effects are included simultaneously.

which correspond to elasticities of 0.1 and 0.14 respectively. By contrast, the effects on the probability of formality on the self-employed with more than 3 employees is similar for women and men, except for the probability of having a written contract.<sup>13</sup>

Table 6 shows the results of the effects of the Tax Reform by firm size. The results show that Law 1607 had greater effects on formal employment among those working in the smallest firms. Panel A report estimates for the full sample; Panel B report estimates for those in firms with 10 or fewer employees; Panel C report results for firms between 11 and 49 employees, and Panel D report results for those in firms with 50 or more employees. The effects for those working in firms with 10 or fewer employees are larger than those for the entire sample. The probability of having a written contract and the probability of making health and pension contributions increases by about six percentage points for self-employed workers with more than 3 employees and it increases tenth-fold for those with less than 10 minimum wages. The effects for workers with less than 10 minimum wages and who work in firms with 11 to 49 employees are significant and bigger than those in the entire sample, but smaller than those found for small firms with fewer than 10 employees. Formality for those earning less than 10 minimum wages in medium-sized firms increased between 11 to 13 percentage points, but there is no effect among self-employed workers in medium-sized firms except for the pension contributions definition of formality.

By contrast, the probability of making health and pension contributions among workers earning less than 10 minimum wages in firms with 50 or more employees increased by only 1.3 percentage points after the reform, which is a much smaller effect than the one found in the full sample. The effects are, thus, bigger among those in smaller and medium size firms than for those

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<sup>13</sup> To allow for the possibility that those closer to the MW may be much more likely to go from informality to formality, we restrict the treatment group to exclude workers close to the MW. Appendix Table A3 excludes those workers with wages that are 10% around the MW. The results are very similar to the ones reported in Table 4.

in bigger firms. This makes sense given that bigger firms were more likely to have to pay the CREE and smaller and medium size firms are more likely to have qualified for exemptions for employees closer to the MW and for self-employed hiring others.

As a check that these results capture the effects of the reform and not some other factors affecting workers after the reform, we performed regressions with placebos. In our placebo, we changed the threshold of ten MW (as specified by Law 1607) to 20 MW in order to calculate the dummy variable for employee wages. In these regressions, we excluded all workers with fewer than 10 MW. Table 7 shows these results with clustered standard errors. We found that there was no effect on formality for people with fewer than 20 MW. As can be observed on Table 7, in many cases the coefficients become negative and they were always insignificant.<sup>14</sup>

Finally, Table 8 shows similar effects to those presented in Tables 4 and 5, but controlling for effects on groups affected by the First Employment Law. In particular, we included indicators for individuals younger than 29 years of age, women older than 40, and individuals earning less than 1.5 MW and we interacted them with a post-2011 indicator, since the First Employment Law was enacted in December 2010. These results show that the effects of the interaction between the reform and employees with less than 10 MW are still positive and significant and similar in magnitude even when controlling for the First Employment Law. In this case, the probability of having a written contract and health or pension contributions increase by about 6.4 to 7 percentage points, respectively, for those earning less than 10 MW. The effects for the self-employed with more than 3 employees also remain positive and significant and of similar magnitude to those we found without controlling for the First Employment Law. The effects for

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<sup>14</sup> Another placebo could involve examining the impact for those below 5 MW or some other threshold below the 10 MW threshold. The problem with this approach, however, is that those with less than 5 MW were indeed affected by the reform so it does not offer a true placebo.

women older than 40 years of age and for those who earn less than 1.5 MW after 2011 are neither statistically nor economically significant. On the other hand, the First Employment Law does seem to have a positive, though small, impacts on younger workers with less than 29 years of age.

In conclusion, people earning less than 10 minimum wages benefited the most from the reform in terms of having a higher likelihood of holding a formal sector job and the effects are greater for women and for workers in small firms.<sup>15</sup>

#### 4.2. Results from Social Security Records

We estimated the following model to calculate the impact of the reform on transitions from unemployment, inactivity, and informal employment into registered employment:

$$P(F_{it}) = bX_{it} + l_s + f_r + \tau_t + \mu_m + \delta_0 \text{Less 10 MW}_{it} + \delta_1 \text{Post}_t \times \text{Less 10 MW}_{it} \\ + \delta_2 \text{Post}_t \times \text{Self-employed More 3 Employees}_{it} + u_{it}$$

where  $P(F_{it})$  is the probability of transitioning from non-employment or informal employment into the formal sector.  $\text{Less 10 MW}_{it}$  and  $\text{Self-employed More 3 Employees}_{it}$  are indicators for groups exempted from the payroll tax, that is, those with less than 10 minimum wages and self-employed workers with two or more employees.  $\text{Post}_t$  is an indicator for whether the company is observed after 2013.  $X_{it}$  includes economic activity and size of the firm. The PILA database does not contain data on age, education, or any other individual characteristic. The geographic and

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<sup>15</sup> The announcement of the Tax Reform in 2012 and its enactment in 2013 may have motivated firms and workers to agree to report earnings around the 10 MW to reduce the payroll tax burden. If this were the case, there would be bunching around the threshold. We ran a regression to check if workers were more likely to report earnings around 10 MWs around the time of the reform. Appendix Table 4 show the probability of reporting wages between 8 and 12 MWs, 8.5 and 11.5 MWs and 9 and 11 MWs. Column 1 shows a negative though very small impact of the reform on the likelihood of reporting wages between 8 and 12 MWs. Columns 2 and 3 narrow this window by looking at reported wages closer to 10 MWs. We find significant, but barely detectable, effects of one tenth of one percent on the likelihood of reporting wages between 8.5 and 11.5 and between 9 and 11 MWs, which for practical purposes we could denominate negligible.

sectorial effects are captured by  $l_s$  and  $f_r$ , respectively, and the year and month effects are captured by  $\tau_t$  and  $\mu_m$ . All of the regressions estimate clustered standard errors at the individual level.

Table 9 shows the effects on transitions into registered jobs for the full sample and by firm size. Columns (1) and (2) show the coefficients for the interaction terms in regressions using the full sample. Columns (3) and (4) show the estimates for firms with fewer than 3 employees, Columns (5) and (6) show the estimates for firms between 3-10 employees; Columns (7) and (8) show the estimates for firms between 10-50 employees and Columns (9) and (10) show the estimates for firms with more than 50 employees. The overall results in Column (1) show an increase in the probability of transitioning into formal sector employment of 3.5 percentage points among employees with less than 10 minimum wages and of 16.3 percentage points among self-employed workers employing more than 2 employees. The specification in Column (2) allows for differential effects for those earnings less than 2 MW, those earnings between 2 and 5 MW and those earning between 5 and 10 MW. As expected, these results show that the impact is greatest on those earning close to the MW and smaller for those with higher wages. The probability of transitioning into formal employment increases by 5.1 percentage points for those earning less than 2 MW, by 2 percentage points for those earning between 2-5 MW and by 1 percentage point for those earning between 5-10 MW. During the 1990s, the higher payroll taxes could not be passed on as lower wages for workers for whom the minimum wage was binding and they could not remain or become formally employed (see Kugler and Kugler, 2009). Therefore, it is likely that a reduction in payroll taxes due to the 2012 reform had the greatest impact in terms of formal employment for this group of workers.

Columns (2)-(10) of Table 9 show the effects on entry into registered jobs for firms of different sizes. Columns (3) and (5) show that the likelihood of transitioning into registered

employment increases by 39.4 and 29.7 percentage points for those in firms with fewer than 4 employees and in firms with 4 to 10 employees who earn less than 10 MW after the reform. Also, Columns (4) and (6) show that the effects are bigger for those earning less than 2 MW, somewhat smaller for those earning between 2-5 MW and even smaller, though still positive and significant, for those earning between 5 and 10 MW. The effects are negative for those in larger firms. Likewise, the likelihood of transitioning into registered employment increases by 11.7, 6 and 7.5 percentage points for self-employed workers with 4 to 10 employees, with 10-50 employees and with more than 50 employees.

### 4.3. Results from the Manufacturing Survey

We estimated the following model to calculate the impact of the reform on the level and composition of employment using the monthly manufacturing sample:

$$E_{jst} = \alpha K_{jst} + l_s + f_r + \Psi_t + \delta_0 \text{Less 10 MW}_{jst-1} + \delta_1 \text{Post}_t \times \text{Less 10 MW}_{jst-1} + v_{jst}$$

where  $E_{jst}$  is employment in establishment  $j$  for permanent production and non-production employees, as well as the percentage of permanent production and non-production employees.  $\text{Less 10 MW}_{jst-1}$  is a dummy variable that equals one if the establishment pays average wages that are less than ten minimum wages before the reform.  $\text{Post}_t$  is an indicator for whether employment at the company occurs after May 2013. The geographic, sectorial, and temporal effects are captured by  $l_s$ ,  $f_r$ , and  $\Psi_t$ .  $K_{jst}$  represents installed capital. All standard errors are clustered by state.

The coefficients of interest are those for the interaction between the variable for less than 10 minimum wages and the variable for after 2013 for the different types of workers. Panel A in Table 10 shows the results for the entire sample, while Panels B, C, D, and E in the same table show the results for establishments with up to 3 employees, 4-10 employees, 11-50 employees,

and more than 50 employees, respectively. Columns (1) and (2) in Table 10 report the impacts on the number of permanent non-production and production employees, Columns (3) and (4) reports impacts on the percent of non-permanent and permanent production workers. For establishment that pay on average less than 10 minimum wages, we observed an increase in the number of permanent workers and employees after 2013. In particular, Columns (1) and (2) in Panel A show that there is an increase of 46.2 permanent non-production employees and of 254 permanent non-production employees in establishments that pay less than 10 minimum wages after the reform. This by itself suggests increased job creation in the manufacturing sector. In addition, Columns (3) and (4) of Panel A show an increase of 10% in the share of permanent non-production employees, though no effect on the share of permanent production employees.

Columns (5) and (6) in Table 10 also show the effects on regular and extraordinary hours for all permanent workers. The results in Column (5) show substitution in working hours for permanent employees. There is a reduction of 279 regular hours or a reduction of 1.5% in regular hours for this group of workers, though no effect for extraordinary hours.

Panels B-E in Table 10 show effects by establishment size. The results show that even though the effects regarding additional permanent workers are naturally smaller in smaller establishments, the effects are clearly larger for smaller companies when looking at the shares of permanent workers. Panels B and C in Table 10 show that the percentage of permanent nonproduction employees increases by 85.8 and 55.5 percent, respectively, in establishments with fewer than 4 employees and in companies with 4 to 10 employees and that pay less than 10 minimum wages on average. Likewise, for small companies that pay less than 10 minimum wages on average, there is an increase in the percentage of permanent production workers. Also, there is a reduction in the regular and extraordinary working hours of permanent employees in

establishments with less than 4 employees and a reduction in regular hours in establishments with 4-10 employees. By contrast, Panels D and E Table 10 show that while there is a positive effect on the number of permanent non-production and production employees, there are no effects on the shares of permanent non-production and production employees or on regular and extraordinary permanent hours among bigger establishments with 10 to 50 employees and with 50 or more employees.

Thus, consistent with the data using the Household Surveys and the Social Security records, we find bigger effects on smaller employers. This is likely because the smaller employers are more likely to face higher labor costs due to their inability to pass these costs to their employees, whose wages tend to be lower. Also, the equity income tax (CREE) introduced by the 2012 Tax Reform likely had a higher incidence on larger employers.

As with the Household Surveys, we carried out regressions with a placebo group using the MMS data. Table 11 shows the results of this placebo using as a threshold 20 minimum wages on average at the establishment-level. The results show no significant effects in the regressions that use 20 MW as a threshold.

## **5. Conclusions**

The results of estimations using data from Household Surveys, the Social Security records, and the Monthly Manufacturing Sample are consistent with an increase in the creation of formal employment in response to the Tax Reform that eliminated payroll contributions for training, family services and health benefits.

In the case of regressions using data from the Household Surveys and the Social Security records, there is strong evidence indicating a greater propensity towards formality among the two

groups who experienced payroll tax reductions due to the reform, i.e., those with less than 10 MW and self-employed with more than 2 employees.

The analysis with the data from the Household Survey (GEIH) and the data from the Social Security records (PILA) show similar effects on formal employment with contributions to pension funds. The Household Survey results show an impact of 6.9 percentage points on the likelihood of being employed jobs with contributions to pension funds for those with less than 10 minimum wages. The Social Security data shows an increase of 3.5 in the likelihood of transitioning to employment registered in a pension fund. The results from the two databases also show positive effects on formal employment among self-employed workers with more than two employees. The Household Survey estimations also show an increase of 1.6 percentage point in the likelihood of being employed in a job with contributions to both health and pension plans for self-employed workers with more than 2 employees. Likewise, the Social Security data results shows an increase of 16.3 in the likelihood of transitioning into a job registered with pension contributions.

Moreover, the results using the Household Survey and Social Security record data show that small firms are the ones most likely to respond to the reform by creating formal jobs. Moreover, the results using the Social Security records are also stronger for those who earn lower salaries closer to the minimum wage. We also included placebo regressions to verify that the results were not driven by the reform and not by other factors. We do a placebos test including interactions with less than 20 MW instead of 10 MW and the results show no effects. The fact that the placebo group was not affected, and that the groups most likely to be affected are indeed the ones for which we find greater effects, confirms that the results are likely driven by the reform.

The Manufacturing Sample results confirm these results and show an increase in permanent employment. These results show an increase in the number and proportion of permanent production and non-production employees after the reform among establishments that pay less than 10 minimum wages on average. The Tax Reform also caused a substitution in the regular hours worked by permanent workers, as would be expected since the costs of hiring permanent workers decreased. As with the individual-level results, establishment-level results show that the Tax Reform had greater impact among companies with fewer than 10 employees.

These effects are larger in comparison to the reform from the mid-nineties in Colombia. Kugler and Kugler (2009) find a much smaller effect – a 10% percent increase in payroll taxes reduced employment by about 5%. The results from the MMS, which are closest to those used by Kugler and Kugler (2009), show that a decrease of 13.5% in payroll taxes introduced by the reform increased the share of permanent non-production workers by 46%.

At the same time, the effects are substantial compared to other reforms carried out in Colombia affecting both the supply and demand of labor. On the demand side, the deductions introduced by the First Employment Law for new hires from specific groups do not appear to be as effective as the exemptions introduced by the Tax Reform. On the supply side, the program Youth in Action (or Jóvenes en Acción in Spanish), which provided vocational training and internships to young individuals, increased formal employment among men and women by 6 and 7 percentage points, respectively. In this case, the cost per employee was \$770 dollars. In comparison, the tax reform probably generated fewer costs, since the funds lost due to the tax exemptions were recovered through the equity income tax. On the other hand, Kugler et al. (2015) find that the effects of the Youth in Action program were permanent. It is too early to know if the

effects of the Tax Reform are long-term, but it is possible that entering the formal sector can generate positive hysteresis and increase the probability of remaining in the formal sector.

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Table 1: Descriptive Statistics for Household Survey, 2010-13

	2010	2011	2012	2013
	(1)	(2)	(3)	(4)
Employer or Employee contributes to Pension Fund	.697 (.46)	.706 (.456)	.721 (.448)	.737 (.44)
Employer or Employee contributes to Health System	.747 (.435)	.758 (.428)	.768 (.422)	.78 (.414)
Workers' Compensation	.683 (.465)	.696 (.46)	.717 (.451)	.734 (.442)
Employer or Employee contributes to Pension/Health Fund	.753 (.431)	.763 (.425)	.774 (.418)	.785 (.411)
Self-Employed	.176 (.381)	.183 (.387)	.197 (.398)	.202 (.401)
Employee	.812 (.391)	.805 (.396)	.791 (.407)	.787 (.41)
Works for the same Company that Pays	.807 (.395)	.861 (.346)	.864 (.343)	.863 (.344)
Written Contract	.716 (.451)	.721 (.449)	.729 (.444)	.742 (.437)
Self-Employed with More than 3 People Hired	.137 (.344)	.141 (.348)	.156 (.363)	.162 (.368)
Firm with less than 10 Employers	.298 (.457)	.292 (.455)	.282 (.45)	.272 (.445)
Female	.477 (.499)	.474 (.499)	.473 (.499)	.482 (.5)
Cohabitants for Less than 2 years	.031 (.173)	.033 (.179)	.036 (.186)	.036 (.187)
Cohabitants for More than 2 years	.261 (.439)	.266 (.442)	.267 (.443)	.272 (.445)
Married	.265 (.442)	.253 (.435)	.249 (.432)	.245 (.43)
Other Marital Status	.443 (.497)	.447 (.497)	.448 (.497)	.447 (.497)
Less than High School	.022 (.146)	.021 (.143)	.02 (.141)	.02 (.139)
High-School Degree	.524 (.499)	.523 (.499)	.512 (.5)	.49 (.5)
Training College Degree	.186 (.389)	.199 (.399)	.216 (.411)	.238 (.426)
University Degree or more	.268 (.443)	.257 (.437)	.252 (.434)	.252 (.434)
Illiterate	.012 (.108)	.011 (.103)	.011 (.105)	.011 (.102)
Observations	83,310	88,058	91,096	91,422

Notes: Table reports means and standard deviation of all socio-economic and work characteristic from 2010 to 2013.

Table 2: Differences in outputs and controls for those with less than 10 MW

	2010	
	More than 10 MW Mean (1)	Less than 10 MW Effect (sd) (2)
Employer or Employee contributes to Pension Fund	.958	-.212*** (.017)
Employer or Employee contributes to Health System	.986	-.194*** (.01)
Workers' Compensation	.977	-.236*** (.011)
Employer or Employee contributes to Pension/Health Fund	.994	-.196*** (.006)
Self-Employed	.106	.052** (.023)
Employee	.894	-.064*** (.023)
Works for the same Company that Pays	.952	-.168*** (.016)
Written Contract	.983	-.23*** (.01)
Self-Employed with More than 3 People Hired	.106	.02 (.023)
Firm with less than 10 Employers	.021	.241*** (.011)
Female	.244	.216*** (.034)
Cohabitants for Less than 2 years	.018	.018 (.011)
Cohabitants for More than 2 years	.077	.179*** (.02)
Married	.66	-.4*** (.038)
Other Marital Status	.245	.204*** (.034)
Less than High School	0	.023*** (.001)
High-School Degree	.045	.486*** (.015)
Training College Degree	.046	.15*** (.015)
University Degree or more	.909	-.659*** (.021)
Illiterate	0	.009*** (0)
Observations	83,310	

Notes: Table reports the difference between treatment and control groups for all socio-economic and work characteristics from 2010 to 2013. 10 Minimum Wages without missing by report. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3: Descriptive Statistics for Social Security Records, 2008-2014

	Full Sample (1)	Firms < 3 Employees (2)	Firms 4-10 Employees (3)	Firms 11-50 Employees (4)	Firms > 50 Employees (5)
Firm Size	840.3 (4,121.2)	1.33 (0.59)	6.57 (2.05)	26.4 (11.42)	3,259.9 (7,625.3)
Average wages / Minimum wages	0.52 (1.94)	0.33 (1.24)	0.70 (1.90)	0.89 (2.11)	1.67 (3.30)
Probability of Transition from Non-employment to Employment	0.23 (0.42)	0.50 (0.54)	0.56 (0.50)	0.55 (0.50)	0.53 (0.50)
Observations	368,310,936	32,240,555	9,402,418	20,038,184	94,741,231

Notes: This table shows the mean and standard deviation in parenthesis. Full Sample estimated using a 25% randomized sample of the universe of Social Security records from January 2008 to December 2014. Firm size estimations using a 12.5% randomized sample of the universe of Social Security records from January 2008 to December 2014. Firm size is estimated as the number of people who report their payment for the same company.

Table 4: Descriptive Statistics for the Monthly Manufacturing Sample, 2007-2014

	Mean (1)
Share of Permanent Non-production Employees	52.2 (109.0)
Share of Permanent Production Employees	99.5 (171.4)
Regular Hours Permanent Non-production Employees	19587.1 (34,327.25)
Extra Hours Permanent Non-production Employees	1725.0 (4,599.4)
Salary of Permanent Non-production Employees	160799.1 (387,913.7)
Salary of Permanent Production Employees	150674.0 (307,710.6)
Observations	120,770

Notes: This table reports the mean and standard deviations in parenthesis of the share of production and non-production employees, and their regular and extraordinary hours as well as their salaries.

Table 5: Effects of the Payroll Tax Reform on Formality, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
Panel A. Full Sample (353,886 Observations)					
Less than 10 Minimum Wages X Reform	0.060*** (0.008)	0.062*** (0.017)	0.069*** (0.018)	0.068*** (0.014)	0.057** (0.025)
Self-employed with More than 3 Workers X Reform	0.011* (0.006)	0.019*** (0.003)	0.020*** (0.002)	0.016*** (0.003)	0.020*** (0.002)
Panel B. Women (168,589 Observations)					
Less than 10 Minimum Wages X Reform	0.123*** (0.008)	0.096*** (0.033)	0.105*** (0.034)	0.105*** (0.030)	0.086* (0.047)
Self-employed with More than 3 Workers X Reform	0.021*** (0.003)	0.023*** (0.004)	0.015*** (0.003)	0.021*** (0.004)	0.022*** (0.005)
Panel C. Men (185,297 Observations)					
Less than 10 Minimum Wages X Reform	0.029*** (0.009)	0.040*** (0.012)	0.046*** (0.012)	0.044*** (0.010)	0.038* (0.018)
Self-employed with More than 3 Workers X Reform	0.008 (0.008)	0.018*** (0.004)	0.024*** (0.004)	0.014*** (0.004)	0.021*** (0.003)

Notes: The table reports coefficients and clustered standard errors by department in parenthesis of linear probability models of different measures of formality on the interaction terms of the post-reform dummy with indicators of whether the worker earns less than 10 MW or the workers is self-employed and hires more than 3 employees. The formality measures include: a Written Contract dummy; an indicator of whether the employer or employee pay Health and Pension Contributions; an indicator of whether the employee is covered by Workers' Compensation. To estimate the share of workers paid less than 10 MW, wages (deflated to their real value at 2013 prices) were divided by the Colombian Minimum Wage of 589,500 pesos in 2013 pesos. All regressions control for age, age squared, years of education, education squared, a female dummy, dummies for marital status, the number of MW the individual earns, the worker's type, firm size, the interaction between firm size and worker type and fixed effects for industry and year. \*\*\* p<0.01, p<0.05, \*p<0.1.

Table 6: Effects of the Tax Reform on Formality by Firm Size, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
Panel A. Full Sample (353,886 Observations)					
Less than 10 Minimum Wages X Reform	0.060*** (0.008)	0.062*** (0.017)	0.069*** (0.018)	0.068*** (0.014)	0.057** (0.025)
Self-employed with More than 3 Workers X Reform	0.011* (0.006)	0.019*** (0.003)	0.020*** (0.002)	0.016*** (0.003)	0.020*** (0.002)
Panel B. 10 and less employees (101,062 Observations)					
Less than 10 Minimum Wages X Reform	1.088*** (0.321)	0.818 (0.521)	0.698 (0.467)	0.896* (0.497)	0.601 (0.486)
Self-employed with More than 3 Workers X Reform	0.073*** (0.011)	0.084*** (0.009)	0.078*** (0.006)	0.082*** (0.008)	0.068*** (0.009)
Panel C. 11 - 49 employees (61,666 Observations)					
Less than 10 Minimum Wages X Reform	0.177*** (0.057)	0.206** (0.078)	0.215*** (0.065)	0.205** (0.077)	0.178* (0.087)
Self-employed with More than 3 Workers X Reform	0.002 (0.019)	0.013 (0.009)	0.024*** (0.008)	0.010 (0.009)	0.018* (0.010)
Panel D. 50 and more employees (191,158 Observations)					
Less than 10 Minimum Wages X Reform	0.005 (0.005)	0.010* (0.005)	0.018* (0.010)	0.013*** (0.004)	0.012 (0.015)
Self-employed with More than 3 Workers X Reform	-0.004* (0.002)	0.002 (0.001)	0.002 (0.002)	-0.001 (0.001)	0.006** (0.003)

Notes: The table reports coefficients and clustered standard errors by department in parenthesis of linear probability models of formality on interactions of Less than 10 MW and Self-Employed who hire more than 3 Workers by firm size. The following measures of formality are used: a Written Contract Dummy; an indicator of whether the employer or employee contributes to Health and Pension funds; an indicator of whether the worker is covered by Workers' Compensation. All regressions include controls for: age, age squared, year of education, education squared, a male dummy, marital status dummy, the share of wages out of the MW, firm size, type of worker indicators and interaction of firm size with type of worker and fixed effects by industry. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 7: Placebo Effects of Less than 20 MW on Formality, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
Panel A. Full Sample (1,404 Observations)					
Less than 20 Minimum Wages X Reform	-0.001 (0.008)	-0.013 (0.009)	-0.013 (0.009)	-0.009 (0.011)	-0.008 (0.018)
Self-employed with More than 3 Workers X Reform	-0.005 (0.005)	0.017 (0.013)	0.030 (0.038)	0.018 (0.013)	-0.017 (0.020)
Panel B. Women (401 Observations)					
Less than 20 Minimum Wages X Reform	-0.000 (0.000)	0.004 (0.004)	-0.020 (0.024)	0.000 (0.001)	0.030 (0.026)
Self-employed with More than 3 Workers X Reform	0.000 (0.000)	0.020 (0.023)	-0.113 (0.073)	0.004 (0.004)	-0.181** (0.071)
Panel C. Men (1,003 Observations)					
Less than 20 Minimum Wages X Reform	0.009* (0.004)	-0.003 (0.004)	-0.003 (0.020)	0.003 (0.005)	-0.000 (0.009)
Self-employed with More than 3 Workers X Reform	0.004 (0.021)	0.019 (0.019)	0.035 (0.057)	0.022 (0.018)	0.007 (0.006)

Notes: The table reports coefficients and clustered standard errors by department in parenthesis of linear probability models of different measures of formality on the interaction terms of the post-reform dummy with indicators of whether the worker earns less than 20 MW or the worker is self-employed and hires more than 3 employees. The formality measures include: a Written Contract dummy; an indicator of whether the employer or employee pay Health and Pension Contributions; an indicator of whether the employee is covered by Workers' Compensation. To estimate the share of workers paid less than 20 MW, wages (deflated to their real value at 2013 prices) were divided by the Colombian Minimum Wage of 589,500 pesos in 2013 pesos. Sample contains observations with more than 10 MW. All regressions control for age, age squared, years of education, education squared, a male dummy, dummies for marital status, the number of MW the individual earns, the worker's type, firm size, the interaction between firm size and worker type and fixed effects for industry and year. \*\*\* p<0.01, p<0.05, \*p<0.1.

Table 8: Effects of Payroll Tax Reform and First Employment Reform on Formality, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
Less than 10 Minimum Wages X Reform	0.064*** (0.010)	0.063*** (0.018)	0.061*** (0.016)	0.070*** (0.015)	0.054** (0.026)
Self-employed with More than 3 Workers X Reform	0.011* (0.006)	0.019*** (0.003)	0.020*** (0.002)	0.016*** (0.003)	0.020*** (0.002)
Less than 29 Years Old X 2010	0.006** (0.003)	0.008* (0.004)	0.023*** (0.006)	0.012** (0.005)	0.014*** (0.003)
Women older than 40 Years Old X 2010	-0.017** (0.007)	-0.010 (0.008)	-0.004 (0.009)	-0.010 (0.008)	-0.008 (0.010)
Less than 1.5 Mminimum Wages X 2010	0.000*** (0.000)	0.000 (0.000)	-0.000*** (0.000)	0.000 (0.000)	-0.000** (0.000)
Times Real Minimum Wage	0.001*** (0.000)	0.001 (0.001)	0.001** (0.000)	0.001** (0.001)	0.002* (0.001)
Observations	353,886	353,886	353,886	353,886	353,886

Notes: The table reports coefficients and clustered standard errors by department in parenthesis of linear probability models of different measures of formality on the interaction terms of the post-reform dummy with indicators of whether the worker earns less than 10 MW or the workers is self-employed and hires more than 3 employees. The formality measures include: a Written Contract dummy; an indicator of whether the employer or employee pay Health and Pension Contributions; an indicator of whether the employee is covered by Workers' Compensation. To estimate the share of workers paid less than 10 MW, wages (deflated to their real value at 2013 prices) were divided by the Colombian Minimum Wage of 589,500 pesos in 2013 pesos. All regressions control for age, age squared, years of education, education squared, a male dummy, dummies for marital status, the number of MW the individual earns, the worker's type, firm size, the interaction between firm size and worker type and fixed effects for industry and year. \*\*\* p<0.01, \*\*p<0.05, \*p<0.1.

Table 9: Effects of Payroll Tax Reform on Transitions to Registered Employment by Firm Size, Social Security Records

	Full Sample		Firms < 3 Employees		Firms 4-10 Employees		Firms 11-50 Employees		Firms > 50 Employees	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Less than 10 MW X Reform	0.035*** (0.001)		0.394*** (0.006)		0.297*** (0.007)		-0.102*** (0.003)		-0.058*** (0.001)	
Self-empl. w/ More than 3 Workers X Reform	0.163*** (0.001)	0.168*** (0.001)			0.142*** (0.001)	0.117*** (0.001)	0.059*** (0.002)	0.060*** (0.002)	0.075*** (0.002)	0.074*** (0.002)
0-2 Minimum Wages X Reform		0.051*** (0.001)		0.457*** (0.008)		0.228*** (0.007)		-0.106*** (0.003)		-0.053*** (0.001)
3-5 Minimum Wages X Reform		0.020*** (0.001)		0.393*** (0.007)		0.363*** (0.006)		-0.102*** (0.003)		-0.073*** (0.001)
6-10 Minimum Wages X Reform		0.010*** (0.001)		0.267*** (0.005)		0.255*** (0.006)		-0.091*** (0.003)		-0.052*** (0.001)
Reported Wages / Minimum Wages	0.001*** (0.000)	0.001*** (0.000)	0.023*** (0.000)	0.026*** (0.000)	0.017*** (0.000)	0.014*** (0.000)	-0.005*** (0.000)	-0.005*** (0.000)	-0.004*** (0.000)	-0.004*** (0.000)
Reform	-0.038*** (0.001)	-0.051*** (0.001)	-0.367*** (0.006)	-0.423*** (0.007)	-0.341*** (0.006)	-0.299*** (0.006)	0.098*** (0.003)	0.102*** (0.003)	0.061*** (0.001)	0.059*** (0.001)
Observations	78,200,257		16,125,810		4,717,052		10,005,116		47,352,279	

Notes: The table reports coefficients and clustered standard errors by individual in parenthesis of linear probability models of the transition to registered employment. All regressions control for the ratio of reported wages (deflated real values at 2015 prices) to the Colombian Minimum wage in 2015 which was 644,350 pesos. All specifications control for industry, state, year and month fixed effects. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 10: Effects of the Payroll Tax Reform on Manufacturing Employment, Monthly Manufacturing Sample

	Number of Permanent Non-Production Employees (1)	Number of Permanent Production Employees (2)	Ratio of Permanent Non-production Employees (3)	Ratio of Permanent Production Employees (4)	Regular Hours for All Permanent Employees (5)	Extraordinary Hours for All Permanent Employees (6)
Panel A. Full Sample (98,953 Observations)						
Average Wages Less than 10 MW X Reform	46.164*** (12.299)	253.904*** (36.251)	0.104** (0.041)	-0.073 (0.113)	-278.551* (146.293)	-37.942 (27.730)
Average Wages / Minimum Wages	4.696*** (0.913)	17.510*** (4.765)	0.004 (0.004)	-0.012* (0.007)	1.020 (0.806)	0.097 (0.178)
Panel B. Less than 4 employees (5,169 Observations)						
Average Wages Less than 10 MW X Reform	2.363** (0.897)	5.961*** (1.177)	0.858*** (0.199)	0.294 (0.202)	-2,545.175*** (95.998)	-29.745** (12.110)
Average Wages / Minimum Wages	0.157*** (0.053)	0.633*** (0.107)	0.110*** (0.028)	0.041* (0.023)	33.558*** (8.607)	3.138*** (1.079)
Panel C. More than 4 and less than 10 employees (7,844 Observations)						
Average Wages Less than 10 MW X Reform	3.077*** (0.932)	9.482*** (2.152)	0.555*** (0.198)	0.439** (0.188)	-1,830.071* (942.582)	-31.833 (27.470)
Average Wages / Minimum Wages	0.283*** (0.078)	0.817*** (0.187)	0.048*** (0.015)	0.022* (0.012)	10.135*** (3.687)	0.830** (0.344)
Panel D. More than 10 and less than 50 employees (21,205 Observations)						
Average Wages Less than 10 MW X Reform	4.839*** (1.708)	17.002*** (4.961)	0.020 (0.103)	0.171 (0.172)	-437.734 (308.641)	-75.621 (69.687)
Average Wages / Minimum Wages	0.363*** (0.102)	0.714 (0.452)	-0.000 (0.006)	0.025* (0.014)	-0.255 (2.564)	0.221 (0.488)
Panel E. More than 50 employees (64,777 Observations)						
Average Wages Less than 10 MW X Reform	35.356*** (11.132)	168.972*** (54.994)	0.030 (0.029)	0.006 (0.136)	-88.831 (66.200)	-16.047 (11.642)
Average Wages / Minimum Wages	3.180*** (1.129)	10.364** (4.831)	-0.007* (0.004)	-0.013* (0.007)	-0.772 (1.406)	-0.230 (0.270)

Notes: The table reports the coefficients and robust standard error in parenthesis by firm size. The regressions include controls for average (deflated in real 2015 values) divided by the minimum wage of 2015 (644.350 Colombian pesos). All specifications control for industry, state, year and month fixed effects. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 11: Placebo Effects of Less than 20 MW on Manufacturing Employment, Monthly Manufacturing Sample

	Number of Permanent Non-Production Employees (1)	Number of Permanent Production Employees (2)	Ratio of Permanent Non-production Employees (3)	Ratio of Permanent Production Employees (4)	Regular Hours for All Permanent Employees (5)	Extraordinary Hours for All Permanent Employees (6)
Average Wages Less than 20 MW X Reform	10.877 (9.613)	7.833 (4.998)	-0.065 (0.071)	0.171** (0.064)	-174.418*** (57.207)	-15.042** (5.406)
Average Wages / Minimum Wages	-3.560*** (1.216)	-0.043 (0.188)	-0.007** (0.003)	-0.006*** (0.002)	-2.783 (1.609)	-0.239 (0.141)
Observations	4,358	4,358	4,358	4,358	4,358	4358

Notes: The table reports the coefficients and robust standard error in parenthesis by firm size. The regressions include controls for average (deflated in real 2015 values) divided by the minimum wage of 2015 (644.350 Colombian pesos). All specifications control for industry, department, year and month fixed effects. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table A1: Effects of Payroll Tax Reform on Formality for those with Less than 10 MW, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
	Panel A. Full Sample (353,886 Observations)				
Less than 10 Minimum Wages X Reform	0.060*** (0.009)	0.063*** (0.017)	0.069*** (0.018)	0.069*** (0.014)	0.058** (0.025)
	Panel B. Women (168,589 Observations)				
Less than 10 Minimum Wages X Reform	0.123*** (0.008)	0.096*** (0.033)	0.105*** (0.033)	0.105*** (0.030)	0.087* (0.047)
	Panel C. Men (185,297 Observations)				
Less than 10 Minimum Wages X Reform	0.030*** (0.010)	0.041*** (0.012)	0.048*** (0.012)	0.045*** (0.010)	0.039** (0.018)

Notes: The table reports coefficients and clustered standard errors by department (in parenthesis) of linear probability models of different measures of formality on the interaction terms of the post-reform dummy with indicators of whether the worker earns less than 10 MW or the workers is self-employed and hires more than 3 employees. The formality measures include: a Written Contract dummy; an indicator of whether the employer or employee pay Health and Pension Contributions; an indicator of whether the employee is covered by Workers' Compensation. To estimate the share of workers paid less than 10 MW, wages (deflated to their real value at 2013 prices) were divided by the Colombian Minimum Wage of 589,500 pesos in 2013 pesos. All regressions control for age, age squared, years of education, education squared, a female dummy, dummies for marital status, the number of MW the individual earns, the worker's type, firm size, the interaction between firm size and worker type and fixed effects for industry and year. Sample of all workers with income and industry. \*\*\* p<0.01, \*\*p<0.05, \*p<0.1.

Table A2: Effect os Payroll Tax Reform on Formality for Self-Employed with More than 3 Workers, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
	Panel A. Full Sample (67,167 Observations)				
Self-employed with More than 3 Workers X Reform	0.144*** (0.015)	0.166*** (0.012)	0.152*** (0.006)	0.163*** (0.009)	0.146*** (0.007)
	Panel B. Women (26,230 Observations)				
Self-employed with More than 3 Workers X Reform	0.168*** (0.026)	0.172*** (0.037)	0.136*** (0.022)	0.178*** (0.033)	0.122*** (0.021)
	Panel C. Men (40,937 Observations)				
Self-employed with More than 3 Workers X Reform	0.127*** (0.013)	0.158*** (0.009)	0.160*** (0.006)	0.150*** (0.013)	0.159*** (0.007)

Notes: The table reports coefficients and clustered standard errors by department (in parenthesis) of linear probability models of different measures of formality on the interaction terms of the post-reform dummy with indicators of whether the worker earns less than 10 MW or the workers is self-employed and hires more than 3 employees. The formality measures include: a Written Contract dummy; an indicator of whether the employer or employee pay Health and Pension Contributions; an indicator of whether the employee is covered by Workers' Compensation. To estimate the share of workers paid less than 10 MW, wages (deflated to their real value at 2013 prices) were divided by the Colombian Minimum Wage of 589,500 pesos in 2013 pesos. All regressions control for age, age squared, years of education, education squared, a female dummy, dummies for marital status, the number of MW the individual earns, the worker's type, firm size, the interaction between firm size and worker type and fixed effects for industry and year. Sample of all Self-Employed with income and industry. \*\*\* p<0.01, p<0.05, \*p<0.1.

Table A3: Effects of the Payroll Tax Reform on Formality -Exclusion 10% around 1 MW-, Household Surveys

	Written Contract (1)	Health Contribution (2)	Pension Contribution (3)	Health and Pension Contribution (4)	Workers' Compensation (5)
Panel A. Full Sample (330,330 Observations)					
Less than 10 Minimum Wages X Reform	0.061*** (0.008)	0.062*** (0.016)	0.069*** (0.017)	0.067*** (0.014)	0.058** (0.025)
Self-employed with More than 3 Workers X Reform	0.009 (0.007)	0.016*** (0.003)	0.017*** (0.003)	0.013*** (0.003)	0.018*** (0.003)
Panel B. Women (159,604 Observations)					
Less than 10 Minimum Wages X Reform	0.124*** (0.007)	0.095*** (0.032)	0.106*** (0.033)	0.104*** (0.029)	0.087* (0.046)
Self-employed with More than 3 Workers X Reform	0.016*** (0.004)	0.017*** (0.003)	0.005 (0.006)	0.015*** (0.003)	0.015*** (0.005)
Panel C. Men (170,726 Observations)					
Less than 10 Minimum Wages X Reform	0.030*** (0.009)	0.039*** (0.012)	0.045*** (0.013)	0.044*** (0.009)	0.037* (0.018)
Self-employed with More than 3 Workers X Reform	0.006 (0.009)	0.017*** (0.004)	0.025*** (0.004)	0.014*** (0.005)	0.021*** (0.003)

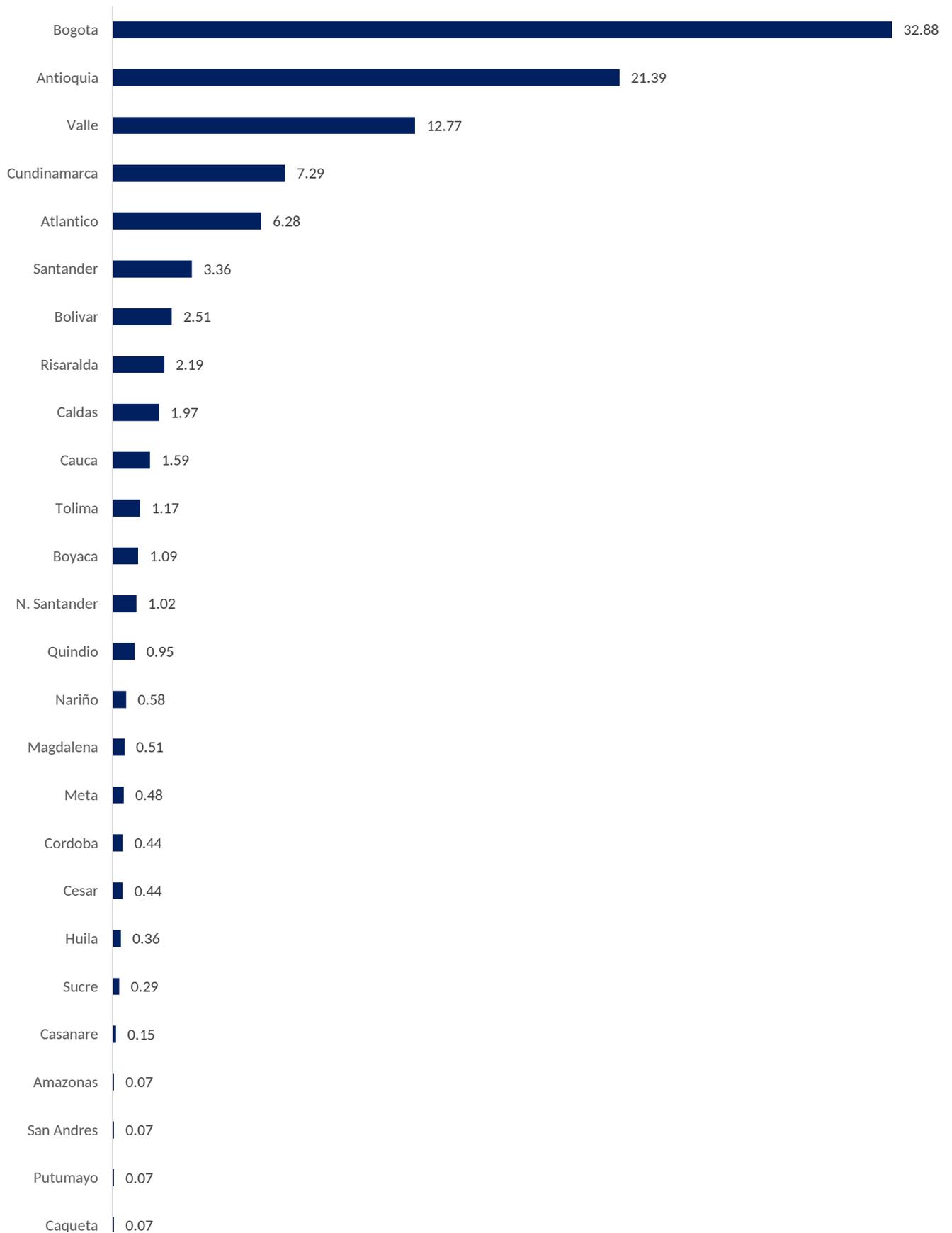
Notes: The table reports coefficients and clustered standard errors by department (in parenthesis) of linear probability models of different measures of formality on the interaction terms of the post-reform dummy with indicators of whether the worker earns less than 10 MW or the workers is self-employed and hires more than 3 employees. The formality measures include: a Written Contract dummy; an indicator of whether the employer or employee pay Health and Pension Contributions; an indicator of whether the employee is covered by Workers' Compensation. To estimate the share of workers paid less than 10 MW, wages (deflated to their real value at 2013 prices) were divided by the Colombian Minimum Wage of 589,500 pesos in 2013 pesos. All regressions control for age, age squared, years of education, education squared, a female dummy, dummies for marital status, the number of MW the individual earns, the worker's type, firm size, the interaction between firm size and worker type and fixed effects for industry and year. Sample excludes population with 5% above and below 1 MW \*\*\* p<0.01, \*p<0.05, \*p<0.1.

Table A4: Bunching effect

	From 8 to 12 MW (1)	From 8.5 to 11.5 MW (2)	From 9 to 11 MW (3)
Reform	-0.001*** 0	0.001*** 0	0.001*** 0
Observations	5,030,925	3,195,775	2,116,038
R-squared	0.032	0.018	0.022

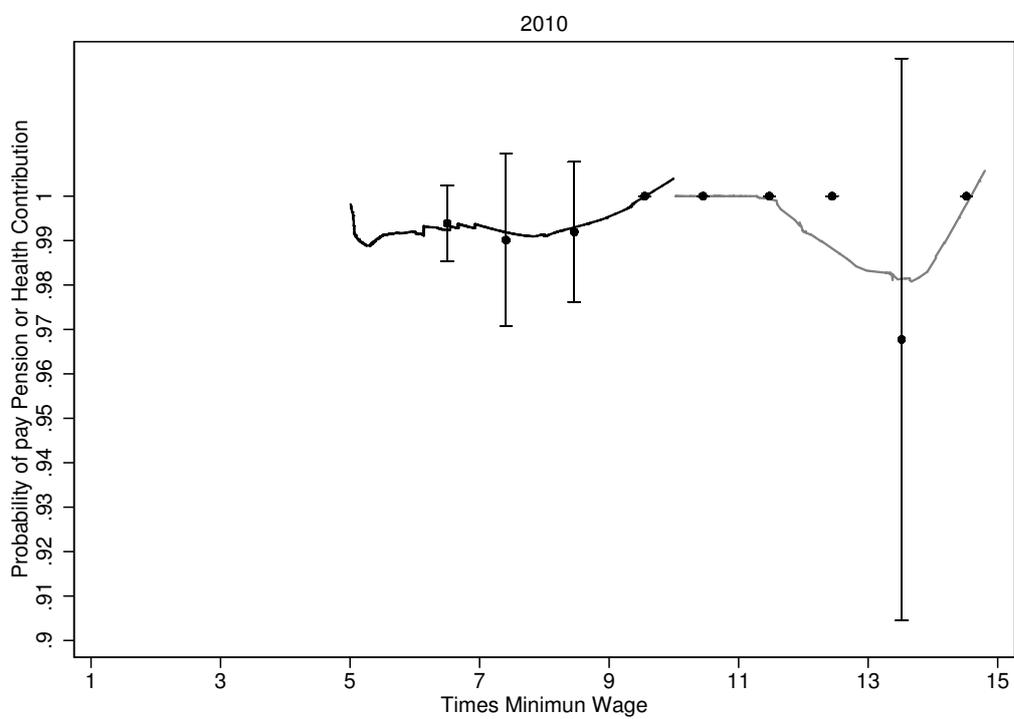
Robust standard errors in parentheses. \*\*\* p<0.01, \*\*p<0.05, \*p<0.1.

Figure 1: Share of firms by State in the MMS



Notes: This figure reports share of establishments in each department from MMS data for the years 2008-2014.

Figure 2: Contribute to Pension or Health Fund



Notes: This figure reports the probability of get a formal job by contribute to Pension and Health Funds in 2010.

## DOES EMPLOYMENT PROTECTION REDUCE PRODUCTIVITY? EVIDENCE FROM US STATES\*

*David H. Autor, William R. Kerr and Adriana D. Kugler*

Theory predicts that mandated employment protection may reduce productivity by distorting production choices. We use the adoption of wrongful-discharge protection by state courts in the US from 1970 to 1999 to evaluate the empirical link between dismissal costs and productivity. Drawing on establishment-level data from the Census Bureau, our estimates suggest that wrongful-discharge protection reduces employment flows and firm entry rates. Moreover, plants engage in capital deepening and experience a decline in total factor productivity, indicative of altered production techniques. Evidence of strong contemporaneous growth in employment, however, leads us to view our findings as suggestive but tentative.

An extensive literature explores the impact of dismissal costs – also frequently called firing costs or employment protection – on the operation of labour markets. Beginning with the seminal work of Lazear (1990), much research has focused on assessing how dismissal costs affect employment levels. Theory suggests, however, that dismissal costs may have ambiguous effects on employment levels. Dismissal costs act as a tax on firing, which reduces dismissals but also reduces hiring. The net effect of these offsetting factors is ambiguous, at least in the short run. It is perhaps not surprising therefore that the empirical literature has found widely varying effects of dismissal costs on employment levels.

By contrast, theory makes a clear prediction about the impact of dismissal costs on the efficiency of hiring and firing. Provided that dismissal protection is not undone by Coasean bargaining, dismissal protection raises firms' adjustments costs. Consequently, firms will find it optimal not to hire workers whose short-term marginal product exceeds their market wage and will choose to retain unproductive workers whose wage exceeds their productivity (Blanchard and Portugal, 2001). These distortions in production choices unambiguously reduce worker flows. They are also likely to cause firms to substitute capital for labour and have the potential to reduce productivity by distorting production choices.

This article evaluates whether, and to what extent, the introduction of dismissal costs affects firms' production choices and, ultimately, their productivity. The source of variation in dismissal costs that we exploit is the adoption of wrongful discharge protection by US state courts from the late 1970s to the early 1990s. These common-law

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protections against wrongful discharge generated a flood of litigation in adopting states and increased the uncertainty and potential cost of discharging workers. As has been established in prior work using both household survey data and aggregate state-level employment data, adoption of wrongful discharge laws had measurable effects on state employment levels, unemployment-to-employment flows, and the outsourcing of jobs to temporary help employers (Miles, 2000; Schanzenbach, 2003; Autor, 2003; Autor *et al.*, 2004, 2006; Kugler and Saint Paul, 2004). Yet, these aggregate effects have rarely been explored using representative microdata on firms, nor have their consequences for productivity been assessed.<sup>1</sup>

In this article, we simultaneously analyse the consequences of employment protection for establishment-level employment flows and productivity. We first test whether dismissal costs reduce employment volatility – a necessary implication of any standard non-Coasean model – both at the extensive (entry/exit) margin and intensive (within-plant) margin. We next assess whether any reduction in employment volatility is accompanied by a reduction in productivity.

Our analysis exploits detailed, comprehensive establishment-level data from two Census Bureau surveys: the Longitudinal Business Database (LBD) and the Annual Survey of Manufacturers (ASM). Sourced from US tax records and Census surveys, the LBD provides annual employment and payroll information on all US private establishments in most lines of business. The LBD is thus an exceptional resource for identifying the effects of dismissal costs on how firms adjust their labour inputs; its employment and wage records cannot, however, facilitate a further study of the concomitant adjustments of other factors of production and the consequences for productivity. We thus complement the LBD with a balanced panel of ‘ongoing’ manufacturing plants continuously surveyed by the ASM. We first demonstrate that the impact of dismissal costs on employment adjustment within this panel mirrors the LBD manufacturing universe, and then turn to the ASM’s detailed operating data (e.g., output, capital investment, employment) to study extensively the important productivity outcomes.

We find that one of the three dismissal protections adopted during this period, the Covenant of Good Faith and Fair Dealing (‘good faith’ hereafter), reduced annual employment fluctuations and the entry of new establishments in adopting states. Consistent with the apparent rise in adjustment costs, we document that firms in adopting states engaged in capital deepening, leading to a concurrent rise in labour productivity. Notably, we find evidence of a decline in total factor productivity following adoption of the good faith exception. Our effects are strongest in the short run, peaking around three years after the adoption and declining afterwards. These results suggest that adoption of dismissal protections altered short-run production choices and caused employers to retain unproductive workers, leading to a reduction in technical

<sup>1</sup> In contemporaneous work, Bird and Knopf (2005) analyse the effects of wrongful-discharge protections on the earnings, profitability and efficiency of the US banking sector from 1980 to 1990. They conclude that adoption of wrongful-discharge protections raised wages, reduced profits and lowered productivity in this sector. Petrin and Sivadasan (2006) introduce and implement a novel framework for estimating the effects of employment protection legislation on productivity, focusing on its impact on the gap between workers’ marginal revenue product and the wage. Using data from Chile, they find that increases in firing costs raise this gap. Prieger (2005) examines the impact of the Americans with Disabilities Act on the entry and exit of firms in retail.

efficiency. Clouding the interpretation of these results, however, is the finding that adoption of the good faith exception is associated with implausibly large subsequent growth in manufacturing employment. This pattern suggests that our results may be partly contaminated by confounding economic shocks. Thus, while our analysis provides novel direct evidence that employment protections may reduce firm-level productivity, the results must be viewed as tentative. It is our hope that future studies will provide further exploration of these initial results.

## 1. Wrongful Discharge Protection in the US

The US has long had a legal presumption that workers and employers may freely terminate their employment relationships ‘at will,’ that is without notification, financial penalty or requirement to demonstrate good (or any) cause. This legal doctrine, referred to as employment-at-will, was first articulated by the Tennessee Supreme Court in 1884 and was subsequently adopted into the common law by almost all US state courts by the mid-1930s (Morriss, 1994).<sup>2</sup>

Beginning in the 1970s, the legal consensus supporting employment-at-will eroded rapidly. In a series of precedent-setting cases between 1972 and 1992, the vast majority of US state courts adopted one or more common-law exceptions to the employment-at-will doctrine. These exceptions constrained the ability of employers operating in adopting states to terminate workers ‘at will.’ These common-law exceptions are typically classified into three categories:

- (1) the implied covenant of good faith and fair dealing (‘good faith’ exception);
- (2) the tort of wrongful discharge in violation of public policy (‘public policy’ exception); and
- (3) the implied-in-fact contract not to terminate without good cause (‘implied contract’ exception).<sup>3</sup>

We summarise these exceptions here and refer the reader to Autor *et al.* (2006) for an extended discussion.

Read broadly, the good faith exception prohibits employers from firing workers for ‘bad cause.’ The definition of ‘bad cause,’ however, varies greatly by state and over time. The California Court of Appeals’ famous 1980 good faith ruling in *Cleary v. American Airlines*<sup>4</sup> – probably the most influential of all good faith cases – was initially understood to bar California employers from terminating *any* worker without good cause. However, the California Supreme Court’s 1988 ruling in *Foley v. Interactive Data Corp* vastly reduced the scope of the *Cleary* decision and limited the financial remedies

<sup>2</sup> Idaho, New Jersey and New Mexico adopted employment-at-will in 1948, 1953 and 1968, respectively. Prior to Idaho, the most recent was Wyoming in 1937. Montana is the only state to have implemented exceptions to the employment-at-will doctrine by statute rather than common law (Ewing *et al.*, 2005).

<sup>3</sup> For detailed discussion of the evolution of the employment-at-will doctrine, see Morriss (1994, 1995), Autor (2003), Kugler and Saint Paul (2004) and Autor *et al.* (2006). Our discussion draws particularly on the latter work, which contains (at present) the most current legal analysis. Legal scholars, including most notably Dertouzos and Karoly (1992), also categorise these exceptions according to whether they allow for tortious damages (i.e., pain, suffering, and possibly punitive damages) in addition to contractual damages (i.e., exclusively economic losses). Recent work has not found that this distinction is empirically relevant (Autor *et al.*, 2006), however, and hence we focus on the three categories of legal exception.

<sup>4</sup> 168 Cal. Rptr. 722 (Cal. Ct. App. 1980 October).

available to plaintiffs.<sup>5</sup> At present, all eleven state courts that recognise the good faith exception (including California) primarily limit awards to 'timing' cases in which the employer intentionally terminates a worker to deprive her of a promised benefit (e.g., a sales commission or non-vested pension). Hence, 'bad cause' under the good faith exception is currently construed narrowly, though this was not always the case.

The public policy exception, recognised by 43 states as of 1999, provides workers with protections against discharges that would inhibit them from acting in accordance with public policy. In states recognising the public policy exception, workers may, for example, litigate if they are fired for performing jury duty, filing a worker's compensation claim, reporting an employer's wrongdoing, or refusing to commit perjury on behalf of the employer. Because courts typically limit public policy cases to clear violations of explicit legislative commands, rather than violations of a vaguer sense of public obligation, the public policy exception is not generally thought to impose substantial constraints on employer behaviour.

The implied contract exception, also recognised by 43 states in 1999, comes into force when an employer implicitly promises not to terminate a worker without good cause. Such implicit promises may include, for example: personnel manuals stating that the employer's policy is to terminate employees only for just cause; expectations arising from a worker's longevity of service or history of promotions and salary increases; and usual company practices that preclude terminating workers without good cause. The expected economic impact of the implied contract exception is hard to gauge. On the one hand, employers can potentially 'contract around' this exception simply by rewording personnel manuals and adding explicit language to employment contracts to state that all employees remain 'at will'.<sup>6</sup> On the other hand, firms without sophisticated human resources staff may be unaware of the implied contract exception or lack the expertise to insulate themselves fully from its reach. Additionally, the implied contract exception can potentially reclassify an employer's entire workforce as not 'at will,' which may impose significant costs.

To assess the effects of these employment-at-will exceptions on productivity and employment outcomes, we adopt a difference-in-difference approach that contrasts state-level changes in outcomes in adopting states to contemporaneous changes in outcomes in non-adopting states. This treatment-control contrast identifies the average causal effect of the exceptions on the outcomes of interest under the assumption that these outcomes would have otherwise evolved similarly in adopting and non-adopting states. We take a number of steps to buttress the robustness of this statistical approach. All econometric models include industry or industry-by-year fixed effects (in addition to state fixed effects) to absorb industry-wide shocks that may be correlated across states. In addition, most specifications include state-specific linear time trends to

<sup>5</sup> 765 P.2d 373 (Cal. 1988). Whereas the *Cleary* decision permitted plaintiffs to recover tortious damages for violations of the good faith doctrine, *Foley* reduced these damages to contractual losses (Jung and Harkness, 1989).

<sup>6</sup> And indeed, large employers took such steps. The Bureau of National Affairs (1985) found that 63% of large employers surveyed in the early 1980s had recently 'removed or changed wording in company publications to avoid any suggestion of an employment contract', and 53% had 'added wording to applications and handbooks specifying that employment may be terminated for any reason'. Sutton and Dobbin (1996) report that the percentage of firms using 'at will' clauses in employment contracts increased from 0% to 29% between 1955 and 1985.

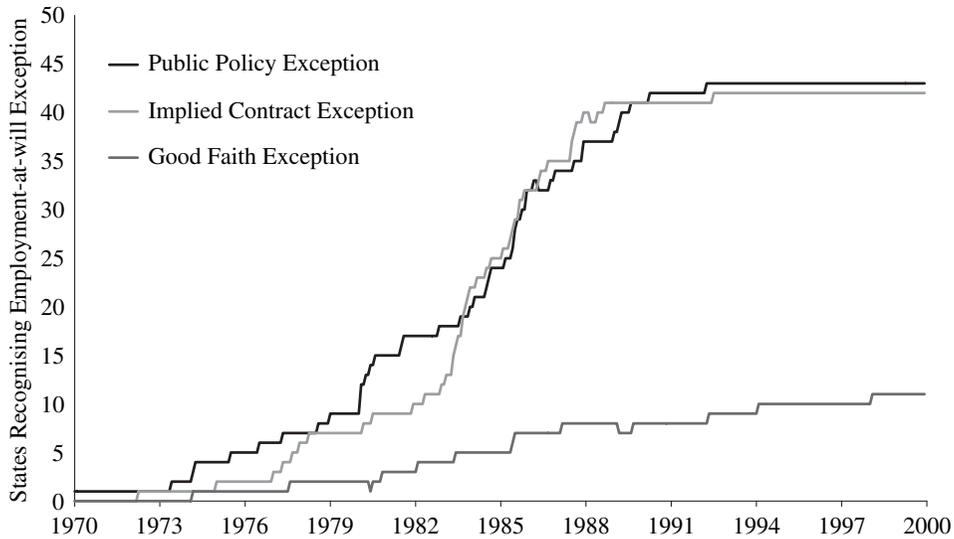


Fig. 1. *Count of States Recognising Exceptions to Employment-at-will, 1970–1999 at Monthly Frequency*

account for possible pre-existing trends that may predate the adoption of employment-at-will exceptions and could otherwise be confounded with adoption. Some specifications further include plant fixed effects, where identification comes from contrasts of within-plant changes in outcomes in adopting relative to non-adopting states. As a falsification test, we also estimate dynamic models that contrast changes in outcomes in years prior to and following adoption of exceptions to provide a check on the possibility that adoption of employment-at-will exceptions are caused by changes in outcomes rather than *vice versa*.

Figure 1 plots the number of states recognising each of the three exceptions during the time period of 1970 to 1999 (at monthly frequency).<sup>7</sup> Two main points are visible. First, the public policy and implied contract exceptions are far more widely recognised than the good faith exception. Second, adoption of each exception appears to follow something of a contagion pattern, with a large number of adoptions occurring in rapid succession between 1976 and 1988, followed by near-stasis from 1988 forward. This pattern suggests that adoptions cannot be viewed as fully independent, but that a widespread change in legal thinking in the 1970s and 1980s led many state courts to amend the long-standing doctrine of employment-at-will at around the same time. This potentially presents a challenge for identification in that businesses might react in advance to anticipated changes in the legal environment, thus blurring the pre-post contrast. However, the date at which a state adopts a given exception is an idiosyncratic function of the cases brought before state high courts and the disposition of the sitting judges. Many states never adopt exceptions and others reverse or amend these exceptions after adoption. Accordingly, precedent-setting cases that generate exceptions to employment-at-will typically will provide a discrete element of surprise. This is

<sup>7</sup> The dips in the series reflect court reversals of doctrines that were previously recognised.

particularly likely to be true for the good faith exception, which was adopted more slowly and less extensively than either the public policy or implied contract exceptions.

As emphasised by Autor *et al.* (2006), it is likely that a substantial component of the economic cost of the employment-at-will exceptions emanates from the uncertainty they introduced into the employment relationship. When most exceptions were adopted in the late 1970s to late 1980s, the volume and cost of wrongful discharge litigation that would ultimately ensue was unknown to firms and potential litigants. Adding to the uncertainty, personnel and professional law journals (i.e., the trade publications relied upon by personnel managers and corporate attorneys) published numerous articles that appeared to overstate the scope of the protections afforded to workers and the penalties that firms would incur for violating them (Edelman *et al.*, 1992). Because employers were potentially led to anticipate greater constraints and costs than ultimately materialised, Autor *et al.* (2006) argue that the short-term and medium-term effects of these dismissal protections may have exceeded their 'steady-state' effects, and they present evidence consistent with this hypothesis.

Several prior studies have analysed the effects of employment-at-will exceptions on labour market outcomes. The first study in this vein, Dertouzos and Karoly (1992), found using aggregate state-level data that adoption of common-law dismissal protections reduced state employment levels by as much as 7%. Subsequent analyses by Miles (2000), Schanzenbach (2003) and Autor *et al.* (2004, 2006) using industry-level and household-level data do not confirm these results, however. These more recent studies find either modest negative effects (Autor *et al.*, Schanzenbach) or no effects of dismissal protections on employment levels (Miles). As noted above, however, theory makes ambiguous predictions about the impact of dismissal costs on employment levels.

A number of studies also provide evidence that states' adoption of dismissal protections raised hiring and firing costs. Miles (2000) and Autor (2003) show that employers in adopting states substituted temporary help agency workers for direct-hire employees, presumably in an effort to minimise litigation risks.<sup>8</sup> Kugler and Saint-Paul (2004) find using the National Longitudinal Survey of Youth that these protections (especially the good faith exception) reduced the re-employment probability of unemployed relative to employed workers, suggesting that dismissal protections exacerbated adverse selection into non-employment. Both sets of findings are significant for our work because they demonstrate that the adoption of dismissal protections raised firms' adjustment costs – a necessary condition for them to have had productivity impacts.

Our study builds on this prior work in two major respects. First, use of establishment-level data provides direct evidence on the effects of dismissal protections on firms' employment adjustments at both the extensive (plant opening/closing) and intensive (job flows) margins. Second, we directly evaluate the consequences of dismissal protections for establishment-level production choices and realised productivity.

<sup>8</sup> The implied contract exception in particular confers a comparative advantage on temporary help agencies since these firms are universally understood to offer only short-term employment. It is the implied contract exception that appears primarily responsible for the growth of temporary help agency employment (Autor, 2003).

## 2. Theoretical Considerations

In a standard competitive model of the labour market, employment protection is economically equivalent to mandated employment benefits. Benefit mandates raise the cost of employing workers, leading to an inward shift in labour demand. If, however, workers value the mandated benefit at its marginal cost of provision – that is, the mandate is efficient – then the Coase theorem applies. Labour supply shifts outward to offset the inward shift in labour demand, employment levels are unchanged and wages fall to cover exactly the cost of the benefit (Summers, 1989; Lazear, 1990). There are no productivity or employment consequences.<sup>9</sup>

Mandatory dismissal protection can impose efficiency costs in the competitive model, however. If workers value dismissal protection at less than its marginal cost of provision – or, equivalently, if some share of the termination benefit accrues to a third-party, such as an attorney – the benefit mandate drives a wedge between the private and social cost of job separations, yielding a deadweight loss. Because dismissal costs are only paid when workers and firms separate, the deadweight loss component of the dismissal cost functions as a tax on separations – an adjustment cost. Consider, for example, a case where a worker's marginal product falls below his wage and the wage cannot drop sufficiently to compensate the firm (either due to a non-negativity constraint or due to downward wage rigidities). If the worker values the dismissal benefit at its marginal cost, both the worker and the firm will agree to terminate the job. If the payment of the dismissal benefit incurs a deadweight loss, however, both the worker and the firm will find it optimal to continue the employment relationship so long as the present value of the productivity shortfall is less than the deadweight loss. Consequently, inefficient dismissal protection – that is, protection that workers value at less than cost – inhibits efficient job separations (and, indirectly, reduces efficient accessions as well).

In the competitive model, inefficient dismissal protection unambiguously reduces allocative efficiency – that is, they are welfare reducing. Their implications for the technical efficiency of production are less clear cut. If dismissal protection causes firms to retain (some) unproductive workers, this will cause a decline in labour productivity, *ceteris paribus*. Offsetting this factor, firms may screen new hires more stringently, leading to a favourable compositional shift in the productivity of the employed workforce. Moreover, because inefficient dismissal protection provides firms with an incentive to substitute from labour to other factors of production, capital deepening may also raise the marginal product of labour. Hence, the net impact on technical efficiency (as opposed to allocative efficiency) is ambiguous.

<sup>9</sup> Aghion and Hermalin (1990) and Levine (1991) present models in which dismissal protection is under-provided by the private market due to adverse selection. Bertola (2004) also presents a model in which dismissal costs are under-provided due to risk-aversion. Agell (1999) discusses why eliminating dismissal protection may not be desirable when labour markets are subject to fairness considerations and market imperfections, while Wasmer (2006) and Macleod and Nakavachara (2007) focus on human capital investment. In all these cases, dismissal protection mandates can be efficiency-enhancing since workers may value this protection above its cost of provision. In the Coasean model, this would imply that imposing the mandate would raise employment levels. See Saint-Paul (2002) and Brügemann (2007) for theories on the political economy of employment protection.

While many labour economists use this competitive model as a benchmark, much of the macroeconomic literature views employment protection through the lens of the Diamond-Mortensen-Pissarides equilibrium unemployment model (Mortensen and Pissarides, 1994; Kugler *et al.*, 2003). As in the competitive model, dismissal costs in the equilibrium unemployment model curtail efficient separations by reducing the threshold productivity at which firms are willing to dismiss workers, thus reducing productivity. In contrast to the competitive model, however, worker-firm matches in the equilibrium unemployment setting generate quasi-rents, and the allocation of rents between firms and workers is typically determined through Nash bargaining. Nash bargaining exacerbates the deadweight loss from inefficient employment protections.<sup>10</sup> In the Nash bargain, dismissal costs reduce the firms' outside options or 'threat points,' causing workers' wage demands to rise even as profits fall. Facing lower profits and higher wage demands, firms curtail job creation and increase the threshold productivity at which they are willing to hire. The induced rise in reservation productivity potentially leads to an *increase* in firm-level productivity since less productive matches are not realised.<sup>11</sup> Hence, the net productivity effect is again ambiguous.

Although the competitive and equilibrium unemployment models differ in their details, both imply that dismissal protection dampens employment adjustments but has ambiguous effects on firms' productivity. On the other hand, both models indicate that if dismissal protection does *not* reduce job flows (perhaps because it satisfies Coasean equivalence), this protection should not affect productivity. These theoretical observations motivate our empirical approach. We begin by assessing whether adoptions of exceptions to the employment-at-will doctrine reduce job flows. We next turn to an analysis of their consequences for firm productivity. Because of the many possible avenues of adjustment noted above, our empirical work examines the impacts of dismissal protection on multiple plant-level production outcomes including capital investment, capital intensity, labour productivity and total factor productivity.

### 3. Data Description

Establishment-level data are essential for characterising how firms and their associated establishments respond to the passage of dismissal protection. This project draws such data from two confidential surveys collected by the Census Bureau – the Longitudinal Business Database (LBD) and the Annual Survey of Manufacturers (ASM). Each survey is described below, and Table 1 provides descriptive statistics.

#### 3.1. Longitudinal Business Database

The LBD is a unique source for studying employment dynamics across manufacturing and non-manufacturing sectors. Sourced from IRS tax data and Census surveys, the LBD annually covers approximately 3.9 million establishments with positive

<sup>10</sup> Nash bargaining amplifies inefficiencies because it is non-Coasean; the initial allocation of property rights affects both the distribution of resources *and* the efficiency of bargained outcomes (Grout, 1984).

<sup>11</sup> Although productivity impacts are ambiguous, welfare consequences are generally negative, as in the competitive case above. If the search equilibrium is not initially constrained efficient, however, it is possible for policy interventions to improve aggregate efficiency (Pissarides, 2000, chapter 8).

Table 1  
*Descriptive Statistics for LBD and ASM, 1976–99*

Annual means of variable	Covered by Exceptions				
	Good faith	Public policy	Implied contract	Never covered	All states
	(1)	(2)	(3)	(4)	(5)
<i>(a) LBD State-SIC2 panel</i>					
Employment change	13%	11%	11%	10%	11%
% Positive change	57%	58%	58%	60%	58%
Surveyed employment	15,078,526	55,598,270	56,151,488	5,387,148	68,091,479
% Manufacturing	25%	28%	28%	21%	28%
% Mining	1%	1%	1%	0%	1%
% Construction	7%	7%	7%	8%	7%
% Wholesale trade	8%	8%	8%	9%	8%
% Retail trade	26%	26%	26%	29%	26%
% Services	32%	29%	30%	32%	30%
% in Entering establishments	8%	7%	7%	8%	7%
% in Exiting establishments	7%	6%	6%	7%	6%
% Part of Multi-unit firms	53%	56%	55%	53%	55%
Surveyed establishments	869,860	3,106,760	3,188,694	333,504	3,871,392
Establishment entry rate	14%	13%	13%	15%	13%
Establishment exit rate	12%	11%	11%	12%	11%
% Part of Multi-unit firms	21%	23%	22%	23%	22%
Maximum states	12	43	43	3	50
<i>(b) ASM manufacturing plant panel</i>					
Plant employment change	11%	11%	11%	10%	11%
% Positive change	49%	49%	49%	50%	49%
Plant employment	790	747	766	658	746
% Non-production workers	32%	26%	27%	25%	26%
% Part of Multi-unit firm	98%	98%	98%	97%	98%
Total Installed capital (m)	\$33	\$30	\$31	\$27	\$31
Total Investment (m)	\$1.9	\$1.7	\$1.7	\$1.5	\$1.7
Labour productivity (k)	\$88	\$86	\$87	\$78	\$85
Maximum plants	794	4,848	4,601	323	5,666

*Notes:* Annual means for Columns 1-3 are calculated over all observations covered by the listed exception during the sample period, including any pre-coverage and post-coverage periods. Figures employ NBER deflators as described in text and are presented in 1999 dollars.

employment, representing over 68 million employees, in most US private industries. Panel (a) of Table 1 highlights that most of the LBD's surveyed employees are in the manufacturing, retail trade and services sectors. These percentages are fairly similar for states passing dismissal protections and those not doing so.<sup>12</sup>

The microdata first facilitate the development of complete state-industry-year panels of employment by summing employment counts across individual establishments. Publicly available series normally do not provide employment counts by state-industry; even when they do so, the Census Bureau is required to suppress values that compromise the confidentiality of individual establishments. Building from the microdata

<sup>12</sup> The LBD's sample frame during the 1976 to 1999 period includes mining; construction; manufacturing; wholesale trade; retail trade; and services (except hospitals, education services, social services, and private households). Sectors not included for the full panel are agriculture, forestry and fishing; transportation and public utilities; finance, insurance and real estate; and public administration. Jarmin and Miranda (2002) describe the construction of the LBD.

overcomes these limitations and a full employment panel is developed for the 1976 to 1999 sample frame.

From this state-industry-year panel, we can estimate absolute year-over-year employment changes. The mean absolute employment change over the sample is approximately 11%. This absolute job turnover metric aggregates over employment adjustments on the intensive margin (i.e., the hiring and firing of workers by continuing establishments) and the entry/exit margin. In the LBD, establishments are assigned unique and time-invariant identifiers that further afford longitudinal estimation of these two dimensions of adjustment. The entry and exit rates for establishments are approximately 13% and 11%, respectively. As many entering and exiting establishments are very small in size, only 7% and 6% of employees are working in entering or exiting establishments, respectively.<sup>13</sup> Finally, the survey's reporting structure affords the linkage of establishments to their parent firms. Approximately 22% of establishments and 55% of employees are part of multi-unit firms.

### 3.2. *Annual Survey of Manufacturers*

While the LBD provides a comprehensive view of employment dynamics across manufacturing and non-manufacturing sectors, reported data are limited to total employment and payroll only. To evaluate the impact of reduced job turnover for capital and productivity outcomes, we turn to two detailed surveys of manufacturers undertaken by the Census Bureau. The Census of Manufacturers (CM) collects operating data on all US manufacturing plants at five-year intervals (i.e., 1972, 1977, and so on). In between the CMs, the Census Bureau conducts the Annual Survey of Manufacturers (ASM). The ASM is a probability sampled subset of the CM, with the panel redrawn two years after each CM. Plants with more than 250 employees in the previous CM are sampled with certainty.

We extract from the ASM a balanced panel of all plants continuously monitored from 1972 to 1999. This restriction focuses on intensive adjustments in large plants operating in stable business climates; by conditioning on survival, the extensive margin is suppressed. While the approximately 5,700 plants represent less than 2% of all US manufacturing establishments, they account for over a quarter of total manufacturing activity in terms of employments and shipments. Almost all of these plants are part of multi-unit firms, although not all of the plants have sister establishments within this balanced panel.

Year-over-year employment changes are again studied. While the average annual employment change is again 11%, a larger fraction of these changes are negative, reflecting the trend decline in manufacturing employment from 1976 to 1999. In addition, the more detailed employment data for manufacturers allow us to examine production and non-production workers separately; the mean non-production worker employment share is 26%.

The continuous monitoring of this ASM panel affords the calculation of detailed capital stocks and productivity metrics. Capital stocks are calculated with the perpetual

<sup>13</sup> Dunne *et al.* (1989) and Kerr and Nanda (2006) provide additional descriptive statistics on entry and exit patterns in the manufacturing and non-manufacturing sectors, respectively.

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inventory method, as explained below. The mean plant-level capital stock for the 1976 to 1999 sample is \$31m in 1999 dollars. Labour productivity is defined as deflated total value of shipments divided by total plant employment. Finally, we estimate total factor productivity (TFP) as the residual from a production function of value-added on four factors: production workers, non-production workers, machinery capital, and structures capital.

#### 4. Consequences of Employment Protection

In this Section we discuss the impact of wrongful discharge protections on firm behaviour. We begin by examining the first-order effect of employment protection on employment fluctuations, both at the intensive (within-establishment) and extensive (entry/exit) margins. If wrongful discharge protections increase adjustment costs, this should lead to a reduction in hiring and dismissals, resulting in an overall dampening of employment fluctuations. We next test the impact of employment protection on employment levels, a margin along which prior research has obtained mixed results. Finally, we turn to the important question of whether the possibly restricted ability of businesses to adjust employment due to the introduction of employment protections has productivity consequences.

##### 4.1. Effects on Employment Fluctuations

We estimate the effects of the wrongful discharge exceptions (i.e., good faith, public policy and implied contract) described in Section 1 on employment fluctuations using both the LBD and ASM. We begin by estimating the following equation using the LBD:

$$ABS_{sjt} = \lambda_s + \kappa_j + \tau_t + \beta_{GF}GF_{st-1} + \beta_{PP}PP_{st-1} + \beta_{IC}IC_{st-1} + \varepsilon_{sjt}, \quad (1)$$

where  $ABS_{sjt}$  is the absolute year-to-year employment change of a two-digit SIC sector  $j$ , in state  $s$ , at time  $t$ ,

$$ABS_{sjt} = \frac{|E_{sjt} - E_{sjt-1}|}{(E_{sjt} + E_{sjt-1})/2}.$$

$\lambda_s$ ,  $\kappa_j$  and  $\tau_t$  are vectors of state, industry and time effects, respectively.<sup>14</sup>  $GF_{st-1}$ ,  $PP_{st-1}$  and  $IC_{st-1}$  are indicators of whether the good faith, public policy and implied contract exceptions were in place in state  $s$  at time  $t - 1$ .<sup>15</sup> Thus, the coefficients  $\beta_{GF}$ ,  $\beta_{PP}$  and  $\beta_{IC}$  capture the effects of employment protection on annual net employment flows.<sup>16</sup>

<sup>14</sup>  $ABS$  is closely linked to Davis *et al.*'s (1996) job reallocation measure estimated at the sector level, which adds the average positive changes in employment in a sector to the average negative changes in employment in a sector.  $ABS$  is defined to be zero if both employments are zero.  $ABS$  is bounded between  $[0, 2]$ , thereby minimising the influence of outliers.

<sup>15</sup> The one-year lag from the survey date is due to employment counts in the LBD and ASM usually being measured as of March 1st.

<sup>16</sup> In addition to the  $ABS$  measure, we estimated models that distinguish between positive and negative adjustments. Since we were unable to reject the hypothesis that the results are symmetric on both margins, we suppress tabulation of these results.

Table 2

*Effects of Employment-at-will Doctrines on LBD Annual Employment Changes, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE
Legal exception	(1)	(2)	(3)	(4)
<i>(a) LBD Absolute annual employment changes, full sample</i>				
Good Faith	−0.005 (0.003)	−0.006 (0.004)	−0.004 (0.003)	−0.005 (0.004)
Public Policy	0.002 (0.002)	0.003 (0.003)	0.002 (0.002)	0.004 (0.003)
Implied Contract	0.000 (0.002)	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)
Obs.	51,074	51,074	51,074	51,074
<i>(b) LBD Absolute annual employment changes, mfg. only</i>				
Good Faith	−0.009 (0.005)	−0.016 (0.007)	−0.006 (0.005)	−0.013 (0.007)
Public Policy	0.006 (0.003)	0.010 (0.003)	0.006 (0.003)	0.011 (0.003)
Implied Contract	0.000 (0.003)	0.003 (0.004)	0.002 (0.003)	0.005 (0.004)
Obs.	21,418	21,418	21,418	21,418

*Notes:* Huber-White robust standard errors clustered on state reported in parentheses.

Our core battery of specifications also includes two estimations of greater stringency. First, we consider models with state-specific time trends. These require that identification come from the discontinuity surrounding the passage of the wrongful discharge exception. These specifications can provide reassurance that our coefficients are not reflecting smoothly trending omitted variables that are potentially correlated with the adoption of the exceptions. A benefit of the state-industry panel is that we can also control for industry-specific trends using the non-parametric form of two-digit SIC industry and year interactions. These latter estimations allow us to control for employment shifts due to national trends in a state's industries, again providing confidence in the identification strategy.

Panels (a) and (b) of Table 2 report estimates of the effects of the wrongful discharge exceptions on employment fluctuations for the Full Sample and for manufacturing only. Panel (a) includes all LBD sectors: manufacturing, mining, construction, wholesale trade, retail trade and services. The reported standard errors account for possible error correlations across firms within a state and within states over time. We weight the samples using the mean employment level in the state-industry-year cells during the early 1976 to 1985 period. The results for the Full Sample show a decline in employment fluctuations following the introduction of the good faith exception, though the results are not statistically significant. By contrast, the results for the public policy and implied contract exceptions show insignificant positive impacts on employment fluctuations.

When we estimate these models for manufacturing alone in Panel (b), we find a negative, and in the majority of cases, significant, effect of the good faith exception on employment fluctuations. This result is robust to the inclusion of state-specific and industry-specific trends. It suggests a reduction in employment fluctuations of 5% to

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12% after the introduction of the good faith exception (i.e., dividing the  $-0.006$  to  $-0.016$  coefficients by the average annual employment change of 13% in Table 1 for states adopting the good faith exception). The results for the implied contract exception remains insignificant. Surprisingly, we find a positive and significant impact of the public policy doctrine on employment fluctuations in the LBD data. This latter result, however, is not supported in the upcoming analysis of the more accurate, establishment-level ASM panel.

The initial LBD analysis suggests a significant effect of the good faith exception on employment fluctuations in manufacturing. To test whether this finding is consistent with a causal relationship, we evaluate the relationship between the adoption of the good faith exception and employment fluctuations using a dynamic specification:

$$\begin{aligned}
 ABS_{ijt} = & \lambda_s + \kappa_j + \tau_t + \sum_{q=-5}^2 \beta_{GFt+q} \Delta GF_{st+q} + \sum_{q=-5}^2 \beta_{PPt+q} \Delta PP_{st+q} + \sum_{q=-5}^2 \beta_{ICt+q} \Delta IC_{st+q} \\
 & + \beta_{GFt-6} GF_{st-6} + \beta_{PPt-6} PP_{st-6} + \beta_{ICt-6} IC_{st-6} + \varepsilon_{ijt}, \quad (2)
 \end{aligned}$$

where  $\Delta GF_{st+q}$ ,  $\Delta PP_{st+q}$  and  $\Delta IC_{st+q}$  indicate whether adoption occurred at year  $t + q$ . These dynamic variables capture the transitory effects of the reforms.  $GF_{st-6}$ ,  $PP_{st-6}$  and  $IC_{st-6}$  estimate long-term outcomes by indicating adoptions that occurred at year  $t - 6$  or before. These coefficients are relative to the period three years prior to the reform, and their pattern indicates whether the earlier pre-post results (1) are consistent with a causal interpretation. In particular, we would be concerned if there are large and statistically significant coefficients on the lead indicators, regardless of whether they are positive or negative. The specification also helps identify whether the largest impacts of the exceptions occur over the short run or long run.<sup>17</sup> To conserve space, we only tabulate coefficients for the good faith exception, with full results for the public policy and implied contract exceptions given in the companion working paper version of this article (Autor *et al.*, 2007).

Appendix Table 1 presents results from this dynamic specification estimated for the manufacturing sector, as well as additional specifications including state-specific and industry-specific trends. The basic specification shows negative coefficients for the good faith lags but mostly insignificant and weakly positive coefficients for the leads, thus supporting a causal interpretation of our results. That is, the introduction of the exception precedes employment changes and not *vice versa*. By contrast, the public policy and implied contract leads and lags have typically positive coefficients, as is shown in Appendix Table 1 of Autor *et al.* (2007). The pattern for the public policy doctrine is particularly noteworthy since it suggests that the unexpected positive estimate for the impact of this doctrine on employment fluctuations found in Table 2 is likely to be spurious. These patterns are robust to the inclusion of state-specific and industry-specific trends. The results using the LBD suggest that the impact of the good faith doctrine peaks approximately three years following adoption and that the long-

<sup>17</sup> The dynamic estimation also includes a second set of lead and lag variables to account for the four cases in which legal exceptions were formally abandoned. The inclusion or exclusion of these additional regressors does not materially influence the reported results.

Table 3  
*Effects of Employment-at-will Doctrines on ASM Annual and Quarterly Employment Changes, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE	Plant FE, YR FE	Col. 5 plus State trends, SIC2-YR FE
Legal Exception	(1)	(2)	(3)	(4)	(5)	(6)
<i>(a) ASM Absolute annual employment changes</i>						
Good Faith	−0.004 (0.004)	−0.005 (0.003)	−0.003 (0.004)	−0.005 (0.003)	−0.006 (0.004)	−0.002 (0.004)
Public Policy	0.000 (0.003)	0.001 (0.003)	−0.001 (0.002)	0.000 (0.003)	0.000 (0.003)	−0.001 (0.002)
Implied Contract	0.000 (0.002)	0.004 (0.002)	0.001 (0.002)	0.003 (0.002)	−0.001 (0.003)	0.001 (0.002)
Obs.	135,937	135,937	135,937	135,937	135,937	135,937
<i>(b) ASM Production worker quarterly churn</i>						
Good Faith	−0.005 (0.009)	0.005 (0.006)	−0.003 (0.008)	0.006 (0.005)	−0.004 (0.009)	0.004 (0.003)
Public Policy	0.005 (0.004)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.005 (0.004)	0.004 (0.004)
Implied Contract	−0.004 (0.005)	−0.003 (0.004)	−0.002 (0.003)	−0.003 (0.003)	−0.004 (0.005)	−0.002 (0.003)
Obs.	135,976	135,976	135,976	135,976	135,976	135,976

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

term effect is insignificant (i.e., six or more years following adoption). This pattern is comparable to Autor *et al.* (2006), who report that the near-term effects of adoption of wrongful discharge doctrines dissipate within approximately five years, perhaps because the initial market uncertainty about the potentially vast – but ultimately modest scope – of the protection offered is resolved (Edelman *et al.*, 1992).<sup>18</sup>

Table 2's results from the LBD suggest that manufacturing was particularly affected by the introduction of wrongful discharge exceptions, likely because manufacturing employment is highly seasonal and highly cyclical, making dismissal protections particularly costly.<sup>19</sup> We use plant-level data from the ASM to further examine the effects of employment protection in manufacturing. Panel (a) of Table 3 presents analogous results to those using the LBD in Table 2. Because our ASM sample uses a balanced panel of ongoing plants, we can now add plant fixed effects to the prior specification, leading to the following estimating equation:

$$ABS_{pt} = \mu_p + \tau_t + \beta_{GF} GF_{st-1} + \beta_{PP} PP_{st-1} + \beta_{IC} IC_{st-1} + \varepsilon_{pt}. \quad (3)$$

The dependent variable is the absolute year-to-year employment change in plant  $p$  from  $t - 1$  to  $t$ ;  $\mu_p$  is a plant fixed effect. As before, we include state-specific and industry-

<sup>18</sup> Only 13 states introduced good faith exceptions during the period studied. California introduced the first good faith exception in a highly visible court ruling. Though our basic and dynamic LBD results on employment changes are strongest for the full sample of states, the results are qualitatively similar but less precise when California is excluded.

<sup>19</sup> The mean year-to-year turnover in manufacturing was 12%, compared to 10% in construction, 6% in wholesale trade, 7% in retail trade, and 8% in services. Only mining had a higher annual turnover (27%). Regressions examining the mining sector also find a substantial dampening of annual employment volatility following the adoption of the good faith exception.

specific trends. The estimated standard errors again allow for error correlations across plants within states and within states over time.<sup>20</sup>

Consistent with the LBD, the results using the ASM suggest that the good faith exception reduces employment fluctuations. We do not find evidence, however, in the ASM sample that the implied contract or public policy doctrines impact employment fluctuations. We estimate in Table 3 that the good faith exception reduces employment fluctuations by 1.5% to 4.5%, which is about half the size of the estimate using the LBD data. While this finding is only marginally statistically significant, supporting evidence from dynamic specifications below suggest that the effect is likely to be causal.

The difference between the LBD and ASM results is explained in part by the fact that in the ASM we can control for additional unobservable factors affecting a plant's employment fluctuations. Contrasting Columns (4) and (6), with and without plant fixed effects, we can see that excluding plant effects using our ASM sample implies a reduction of 5% in employment fluctuations as opposed to 2% with plant effects. As is shown in the next Sections, the remaining differences between the estimates in the LBD and the ASM samples are likely due to the fact that the LBD includes entering and exiting business while the ASM sample is composed of a balanced sample of ongoing plants. The ASM analysis therefore excludes any effect of wrongful discharge protections on employment fluctuations occurring through entry and exit.

As with the LBD, we also estimate a dynamic specification using ASM data. Panel (a) of Appendix Table 2 presents these estimates. Similar to the patterns found with the LBD, leads of the good faith exception are found to have weakly positive and insignificant effects on employment fluctuations while lags of the good faith exception have negative effects on employment changes. The maximum dampening is again attained three years following adoption. As with the LBD estimates, the long-term impacts are insignificant and, in the case of the ASM, weakly positive.<sup>21</sup>

Since employment protection may also affect seasonal employment fluctuations (Wolfers, 2005), we also study a *quarterly* employment churn measure to complement the year-over-year changes. In particular, we estimate (3) using as a dependent variable the following measure of quarterly churn for production workers:<sup>22</sup>

$$PWChurn_{pt} = \frac{PW_{pt}^{\max} - PW_{pt}^{\min}}{(PW_{pt}^{\max} + PW_{pt}^{\min})/2},$$

where  $PW_{pt}^{\max}$  and  $PW_{pt}^{\min}$  are the maximum and the minimum quarterly production-worker employment in plant  $p$  in year  $t$ , respectively. As before we allow for state-specific and industry-specific trends and cluster the standard errors on state.

<sup>20</sup> We have also estimated analogous models using an unbalanced panel of ASM plants (i.e., not limited to those continually operating). Findings from these models, which are qualitatively similar, are available from the authors on request.

<sup>21</sup> As for the LBD results, the ASM findings are qualitatively similar but somewhat less precise when we exclude California from our sample. As a complement to the panel estimations, similar results are found with lagged dependent variable specifications that test for mean reversion.

<sup>22</sup> The ASM does not collect quarterly employment for non-production workers. The plant-level ASM does not allow us to estimate employment effects separately by demographic group, as is feasible with data from household surveys as in Kahn (2007).

Panel (b) of Table 3 shows results for these specifications. Estimates without state trends show negative effects of the good faith exception on seasonal adjustments of production workers, but the results are not significant and the effects become positive when controlling for state trends. Looking deeper, however, the results from the underlying dynamic specifications reported in Panel (b) of Appendix Table 2 consistently show weakly positive coefficients on the leads and negative coefficients on the lags. Moreover, the dampening is again most significant three years after the adoption. Thus, the dynamic specifications appear most consistent with a significant causal effect of the good faith exception on seasonal employment fluctuations over the short-run to medium-run.

#### 4.2. *Effects on Entry and Exit*

The difference in the magnitudes of the estimated effects of wrongful discharge exceptions on employment fluctuations in the LBD and the ASM samples suggests that part of the reduction in employment fluctuations observed following adoption of the good faith exception is explained by changes in firm entry and exit (i.e., the extensive employment margin). To evaluate the importance of external adjustment, we use the LBD to estimate regressions similar to (1), where the dependent variable is the log of the average count of plants over five-year intervals among continuing, entering and exiting businesses. We use five-year averages to minimise the possibility of capturing spurious entry and exit due to 'ghosting' and reporting bumps observed surrounding Census years. The wrongful discharge indicators take the value of one if the exceptions had been adopted as of the midpoint of the five-year intervals.<sup>23</sup>

Panels (a)–(d) of Table 4 report results of these regressions for total, continuing, entering and exiting plants, respectively. Panel (a) shows little change in the total count of plants in response to the introduction of any of the exceptions. However, Panels (b)–(d) show that in the case of the good faith exception, this reflects countervailing forces among continuing and other plants. Panel (b) shows an increase in plant survival after the introduction of good faith exceptions, though this effect is only marginally significant. Panel (c) shows that entry is substantially reduced in manufacturing after the introduction of good faith exceptions, though exit is unaffected. These results, controlling for state-specific and industry-specific trends, suggest a reduction of 7.7 log points in the number of entering plants, where log points refer to 100 times the coefficient in the log-linear specification (thus roughly corresponding to percentage point changes).<sup>24</sup> This translates into a reduction of about 9,000 establishments. By contrast, the public policy and implied contract exceptions do not appear to affect entry.

<sup>23</sup> Annual regressions of entry and exit yield quantitatively similar results, though the magnitudes are smaller. Studying entry and exit at five-year intervals avoids spurious peaks of entry and exit rates surrounding Census years, when additional manpower is devoted to updating the business registry. This updating has a noticeable effect on establishment counts but not on summed employment levels used for year-to-year employment changes. Entry and exit are defined as the first and last year an establishment is observed in the LBD, respectively, with the end years of the sample excluded. Establishments alive for a single year are recorded as both entering and exiting. This procedure ignores potential exit and re-entry by establishments, but more importantly avoids spurious entry and exit from 'ghosting' establishments with poor longitudinal linkages.

<sup>24</sup> This result is consistent with Kugler and Pica (forthcoming), who find that increased dismissal costs in Italy after the 1990 labour market reform reduced entry of small firms.

Table 4  
*Effects of Employment-at-will Doctrines on LBD Plant Counts, 1978–97*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE
Legal exception	(1)	(2)	(3)	(4)
<i>(a) LBD Mfg. log count of all plants</i>				
Good Faith	0.027 (0.023)	0.026 (0.013)	0.003 (0.032)	0.020 (0.026)
Public Policy	0.061 (0.021)	0.008 (0.006)	0.068 (0.026)	0.006 (0.023)
Implied Contract	-0.012 (0.019)	-0.017 (0.007)	-0.019 (0.025)	-0.017 (0.016)
Obs.	3,911	3,911	3,911	3,911
<i>(b) LBD Mfg. log count of continuing plants</i>				
Good Faith	0.047 (0.027)	0.040 (0.015)	0.021 (0.036)	0.035 (0.027)
Public Policy	0.068 (0.024)	0.008 (0.007)	0.076 (0.029)	0.007 (0.024)
Implied Contract	-0.013 (0.022)	-0.015 (0.008)	-0.021 (0.027)	-0.015 (0.017)
Obs.	3,891	3,891	3,891	3,891
<i>(c) LBD Mfg. log count of entering plants</i>				
Good Faith	-0.117 (0.031)	-0.068 (0.028)	-0.131 (0.032)	-0.077 (0.034)
Public Policy	0.016 (0.028)	-0.011 (0.028)	0.015 (0.030)	-0.019 (0.033)
Implied Contract	-0.021 (0.024)	-0.030 (0.031)	-0.016 (0.028)	-0.030 (0.034)
Obs.	3,846	3,846	3,846	3,846
<i>(d) LBD Mfg. log count of exiting plants</i>				
Good Faith	0.011 (0.026)	0.005 (0.034)	-0.012 (0.029)	-0.002 (0.043)
Public Policy	0.063 (0.018)	0.048 (0.022)	0.068 (0.023)	0.042 (0.032)
Implied Contract	-0.006 (0.020)	-0.022 (0.022)	-0.009 (0.023)	-0.021 (0.025)
Obs.	3,862	3,862	3,862	3,862

Notes: Five-year blocks. Huber-White robust standard errors clustered on state-year reported in parentheses.

In combination with the findings in Tables 2 and 3, these results suggest that the dampening effect of the good faith exception on employment fluctuations operates through two channels: a reduction in net employment flows in ongoing plants and a reduction in the entry of new plants. The reduced rate of establishment creation helps reconcile the smaller decline in employment fluctuations evident in the ASM panel compared to the LBD.<sup>25</sup>

#### 4.3. *Effects on Employment Levels*

Here we explore the effects of wrongful discharge exceptions on employment levels. As discussed, the effect of these dismissal protections on net employment is theoretically ambiguous (at least in the short run) since both dismissals and hiring are affected.

<sup>25</sup> See Koeniger and Prat (2007) for analysis of product market regulation and the extensive margin.

Table 5  
*Effects of Employment-at-will Doctrines on ASM Employment Levels, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE	Plant FE, YR FE	Col. 5 plus State trends, SIC2-YR FE
Legal exception	(1)	(2)	(3)	(4)	(5)	(6)
<i>(a) ASM Log total employment</i>						
Good Faith	0.025 (0.033)	0.079 (0.036)	0.015 (0.030)	0.068 (0.032)	0.033 (0.031)	0.020 (0.025)
Public Policy	0.015 (0.016)	-0.002 (0.013)	0.014 (0.014)	-0.001 (0.012)	0.016 (0.016)	0.010 (0.013)
Implied Contract	-0.012 (0.018)	-0.011 (0.012)	-0.004 (0.015)	-0.005 (0.011)	-0.012 (0.018)	-0.009 (0.015)
Obs.	135,976	135,976	135,976	135,976	135,976	135,976
<i>(b) ASM Log production worker employment</i>						
Good Faith	-0.002 (0.034)	0.083 (0.039)	-0.008 (0.030)	0.070 (0.034)	0.003 (0.032)	-0.002 (0.025)
Public Policy	0.019 (0.017)	0.000 (0.013)	0.017 (0.014)	0.000 (0.012)	0.021 (0.017)	0.014 (0.013)
Implied Contract	-0.010 (0.020)	-0.011 (0.013)	0.001 (0.016)	-0.003 (0.012)	-0.009 (0.020)	-0.004 (0.016)
Obs.	135,932	135,932	135,932	135,932	135,932	135,932
<i>(c) ASM Log non-production worker employment</i>						
Good Faith	0.052 (0.035)	0.079 (0.026)	0.040 (0.033)	0.071 (0.025)	0.065 (0.037)	0.048 (0.035)
Public Policy	0.012 (0.018)	-0.009 (0.013)	0.014 (0.016)	-0.005 (0.013)	0.009 (0.018)	0.008 (0.015)
Implied Contract	-0.014 (0.017)	-0.009 (0.011)	-0.008 (0.016)	-0.005 (0.011)	-0.018 (0.018)	-0.012 (0.015)
Obs.	135,232	135,232	135,232	135,232	135,232	135,232

*Notes:* Huber-White robust standard errors clustered on state reported in parentheses.

We start by estimating similar regressions to (3) using the ASM data, but where the dependent variable is the log of employment in plant  $p$  at time  $t$ . Table 5 presents results of these regressions for total employment as well as for production and non-production employment separately. Panel (a) shows that total employment increases with the introduction of the good faith and public policy exceptions, though the public policy results are insignificant. The implied contract exception has a negative though insignificant effect on employment, which is consistent in sign and magnitude – though not statistical significance – with the findings in Autor *et al.* (2004, 2006).

When employment is disaggregated into production and non-production workers, we find that the increase in total employment following the introduction of the good faith exception is driven primarily by the increase in employment of non-production workers. For example, the final columns of Panels (b) and (c) suggest that production employment does not react to the introduction of the good faith exception while non-production employment in the typical plant increases by 4.8 log points following the introduction of this exception.<sup>26</sup> This differential rise in non-production demand may be explained by capital–skill complementarity (Griliches, 1969; Berman *et al.*, 1994), as

<sup>26</sup> These results are robust to various specifications and to the exclusion of California and Arizona, even though Arizona had unusually high employment growth during the 1980s and 1990s.

Section 4 will show, the adoption of the good faith exception may have spurred capital-deepening in firms.

As before we also estimate dynamic specifications to test whether our findings are consistent with a causal interpretation. In these specifications, found in Appendix Table 2 of our working paper (Autor *et al.*, 2007), the estimated impact of the good faith exception on employment levels commences a year prior to adoption and becomes puzzlingly large in subsequent years when state-specific trends are included, exceeding 10 log points six years ahead. This pattern is very unlikely to reflect a causal relationship and suggests the presence of confounding shocks. A potential explanation is that California and Arizona, the two largest states that adopted a good faith exception, experienced unusually strong employment growth in the late 1980s, likely for reasons unrelated to this particular legal doctrine.<sup>27</sup> The results for the public policy exception have inconsistent signs across specifications and show no evidence of a trend break after adoption of the doctrine. By contrast, results for the implied contract exception show consistently negative effects for both leads and lags, though the lead effects are smaller.

Table 6 shows results from regressions similar to (1) using LBD data, but where the dependent variable is the log of average manufacturing employment in state  $s$  and industry  $j$  over five-year intervals and where the wrongful discharge indicators take the value of one if the exceptions had been adopted as of the midpoint of the five-year intervals. Panel (a) presents results for all plants, while Panels (b)–(d) present results for continuing, entering and exiting plants, respectively.<sup>28</sup>

Consistent with the results from the ASM, which includes only continuing plants, we find that total employment in the LBD sample increased by about 7.8 log points following the adoption the good faith exception. Examining employment separately for continuing, entering and exiting plants in Panels (b)–(d) shows that this growth is driven by continuing plants. Panel (b) shows a significant increase in employment of 8.3 log points in continuing plants, while Panels (c) and (d) show a marginal decline in employment created by plant entry and an increase in employment lost due to plant exit, although these two effects are not statistically significant. Note also the close comparability of the estimated effects of the good faith exception on employment levels in the ASM sample (Table 5, (a)) and on employment levels in ongoing plants in the LBD (Table 6, (b)). This pattern is expected since the ASM sample is composed exclusively of ongoing plants. In summary, the net growth of employment that we observe after adoption of the good faith exception is accounted for by reduced job creation in entering plants and increased job destruction in exiting plans – both of which led to reduced employment – accompanied by more than offsetting employment growth in ongoing plants.

As with the ASM, dynamic specifications (found in Appendix Table 3 of our companion working paper) show positive coefficients on the good faith exception's leads

<sup>27</sup> In fact, excluding California from the estimates largely eliminates the estimated positive employment effects of the good faith exception. However, California is arguably the strongest test-case for evaluating the labour market impact of this exception since the *Cleary* decision is *the* landmark case among good faith rulings. We are accordingly reluctant to remove California from the sample. Excluding Arizona reduces but does not eliminate the estimated positive employment effect.

<sup>28</sup> Annual employment regressions yield quantitatively similar results, though the magnitudes of the coefficients are smaller. We use employment at five-year intervals here to keep consistency with the results on the counts of entering and exiting plants presented in the previous Section.

Table 6  
*Effects of Employment-at-will Doctrines on LBD Employment Levels, 1978–97*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE
Legal exception	(1)	(2)	(3)	(4)
<i>(a) LBD Mfg. log empl. in all plants</i>				
Good Faith	0.061 (0.044)	0.092 (0.028)	0.045 (0.053)	0.078 (0.044)
Public Policy	0.066 (0.025)	0.015 (0.016)	0.064 (0.031)	0.011 (0.032)
Implied Contract	-0.027 (0.028)	-0.009 (0.018)	-0.032 (0.033)	-0.012 (0.027)
Obs.	3,911	3,911	3,911	3,911
<i>(b) LBD Mfg. log empl. in continuing plants</i>				
Good Faith	0.067 (0.045)	0.096 (0.029)	0.051 (0.054)	0.083 (0.044)
Public Policy	0.067 (0.026)	0.008 (0.016)	0.065 (0.032)	0.005 (0.032)
Implied Contract	-0.030 (0.028)	-0.015 (0.018)	-0.034 (0.033)	-0.017 (0.028)
Obs.	3,891	3,891	3,891	3,891
<i>(c) LBD Mfg. log empl. in entering plants</i>				
Good Faith	-0.004 (0.048)	0.014 (0.056)	-0.023 (0.053)	-0.001 (0.068)
Public Policy	0.035 (0.046)	0.127 (0.047)	0.029 (0.047)	0.106 (0.052)
Implied Contract	0.021 (0.045)	0.123 (0.058)	0.020 (0.046)	0.113 (0.056)
Obs.	3,846	3,846	3,846	3,846
<i>(d) LBD Mfg. log empl. in exiting plants</i>				
Good Faith	0.073 (0.048)	0.075 (0.093)	0.048 (0.056)	0.066 (0.112)
Public Policy	0.080 (0.038)	0.140 (0.050)	0.070 (0.040)	0.111 (0.056)
Implied Contract	0.019 (0.040)	0.133 (0.044)	0.016 (0.044)	0.124 (0.045)
Obs.	3,862	3,862	3,862	3,862

*Notes:* Five-year blocks. Huber-White robust standard errors clustered on state-year reported in parentheses.

and implausibly large positive coefficients on the lags, making questionable a causal interpretation of the effects on employment. The results for the public policy and implied contract doctrines are comparable to the prior estimates.<sup>29</sup>

#### 4.4. *Effects on Productivity*

The finding that the good faith exception reduces job flows is consistent with the expectation that this discharge protection raises firms' adjustments costs. Here we explore the consequences of this rise in adjustment costs on other margins of non-labour adjustment. One such margin is capital substitution; if discharge protections

<sup>29</sup> Table 6 also shows economically large, although inconsistent, effects of the public policy exception on employment levels. Similar to earlier studies, this pattern raises puzzles about the interpretation between the public policy exception and employment.

raise the effective price of labour by making it more expensive to hire and fire, firms may substitute towards other inputs. Second, given the restrictions on firms' ability to adjust, we also may expect total factor productivity to be affected – though as noted in Section (2), compositional shifts in worker hiring following the adoption of dismissal protections may generate countervailing effects on labour productivity.

We begin by examining whether productivity was affected by employment protections due to changes in input composition. In particular, we ask whether the introduction of employment protections affected capital investment and, subsequently, capital–labour ratios. Panels (a) and (b) of Table 7 report results of specifications similar to (1) and (3) without and with state-specific and industry-specific trends but where the dependent variables are the log of total capital investment and the log of the capital–labour ratio.

Capital stocks are measured at the beginning-of-year and constructed using the perpetual inventory method. Capital stocks are separately calculated for machinery and structures and then aggregated for total capital metrics. The capital stock of plant  $p$  in industry  $j$  at time  $t$  is:

$$K_{pt} = (1 - \delta_{jt-1})K_{pt-1} + \frac{I_{pt-1}^N}{P_{jt-1}^N} + \frac{I_{pt-1}^U}{P_{jt-3}^N},$$

where initial capital stocks in 1972 are obtained by deflating book values of capital by BEA two-digit SIC deflators for installed capital. New equipment investments,  $I_{pt-1}^N$ , are deflated with NBER four-digit SIC new-capital deflators,  $P_{jt-1}^N$ . Used equipment purchases,  $I_{pt-1}^U$ , employ the NBER four-digit SIC deflators lagged three periods. The annual depreciation rates,  $\delta_{jt-1}$ , are obtained from the BEA by two-digit SIC industries.

Table 7

*Effects of Employment-at-will Doctrines on ASM Capital Investment, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE	Plant FE, YR FE	Col. 5 plus State trends, SIC2-YR FE
	(1)	(2)	(3)	(4)	(5)	(6)
Legal exception						
(a) ASM Log total capital investment						
Good Faith	0.087 (0.037)	-0.146 (0.057)	0.059 (0.034)	0.122 (0.050)	0.092 (0.035)	0.065 (0.031)
Public Policy	0.019 (0.025)	0.001 (0.027)	0.023 (0.025)	0.005 (0.024)	0.022 (0.025)	0.024 (0.025)
Implied Contract	0.012 (0.020)	-0.002 (0.024)	0.011 (0.020)	0.003 (0.021)	0.009 (0.021)	0.005 (0.022)
Obs.	133,608	133,608	133,608	133,608	133,608	133,608
(b) ASM Log total capital–labour ratio						
Good Faith	0.056 (0.027)	-0.022 (0.024)	0.034 (0.021)	-0.021 (0.024)	0.045 (0.026)	0.046 (0.012)
Public Policy	-0.028 (0.019)	0.000 (0.013)	-0.025 (0.014)	-0.003 (0.011)	-0.027 (0.019)	-0.020 (0.012)
Implied Contract	0.024 (0.021)	0.016 (0.011)	0.011 (0.015)	0.008 (0.010)	0.020 (0.021)	0.011 (0.014)
Obs.	119,181	119,181	119,181	119,181	119,181	119,181

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

Panel (a) of Table 7 shows a positive and significant effect of the introduction of the good faith exception on total investment (machinery and structures) of 6.5 log points (Column 6) but show no effects from the introduction of the public policy and implied contract exceptions. Dynamic specifications, found in Appendix Table 4 of the companion working paper, indicate that capital investment peaks several years after adoption of the good faith exception and then declines somewhat thereafter (a pattern similar to the results for employment fluctuations). However, leads of the good faith adoption variable in the dynamic specifications are notably negative (though statistically insignificant), suggesting that part of the post-adoption rise in capital investment may reflect an investment rebound from an earlier downturn.

Not surprisingly given the increase in employment levels, Panel (b) of Table 7 shows mixed – albeit generally positive – effects of the good faith exception on capital-labour ratios. For example, estimated effects are negative when controlling for state-specific trends but become positive when controlling for plant effects. Dynamic specifications, given in Appendix Table 5 of the working paper, find negative coefficients on both leads and lags, raising the question of whether the introduction of the good faith exception followed rather than preceded increases in the capital-labour ratio.

To explore effects on productivity, Panel (a) of Table 8 presents results of specifications like (1) and (3), but where the dependent variables is a TFP measure estimated using a production function residual methodology. For the residuals methodology, we

Table 8  
*Effects of Employment-at-will Doctrines on ASM Labour Productivity and Total Factor Productivity, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE	Plant FE, YR FE	Col. 5 plus State trends, SIC2-YR FE
Legal xception	(1)	(2)	(3)	(4)	(5)	(6)
<i>(a) ASM Total factor productivity</i>						
Good Faith	-0.019 (0.014)	-0.023 (0.009)	-0.017 (0.014)	-0.022 (0.009)	-0.020 (0.015)	-0.014 (0.008)
Public Policy	0.006 (0.008)	0.004 (0.007)	0.005 (0.008)	0.004 (0.007)	0.004 (0.009)	0.002 (0.008)
Implied Contract	-0.005 (0.008)	-0.003 (0.008)	-0.005 (0.008)	-0.003 (0.008)	-0.004 (0.008)	-0.006 (0.007)
Obs.	110,881	110,881	110,881	110,881	110,881	110,881
<i>(b) ASM Log labour productivity</i>						
Good Faith	0.050 (0.018)	-0.004 (0.008)	0.051 (0.015)	0.002 (0.008)	0.039 (0.017)	0.044 (0.011)
Public Policy	-0.004 (0.010)	0.004 (0.005)	-0.008 (0.009)	0.005 (0.006)	-0.003 (0.011)	-0.008 (0.009)
Implied Contract	0.001 (0.011)	0.005 (0.007)	0.001 (0.010)	0.006 (0.007)	-0.002 (0.011)	-0.002 (0.009)
Obs.	135,972	135,972	135,972	135,972	135,972	135,972

*Notes:* Huber-White robust standard errors clustered on state reported in parentheses. TFP is the establishment-level residual from a regression of value-added on four factors of production (production employment, non-production employment, machinery capital and structures capital) at the industry-year level.

first estimate the following production function in logs for each two-digit SIC industry and year using ordinary least squares:

$$\log(Y_{pt}) = \alpha + \zeta_{jt} \log(L_{pt}) + \gamma_{jt} \log(H_{pt}) + \theta_{jt}^M \log(K_{pt}^M) + \theta_{jt}^S \log(K_{pt}^S) + \xi_{pt},$$

where  $Y_{pt}$  is value added (i.e., total value of shipments net of materials/fuels costs and inventory adjustments) in plant  $p$  at time  $t$  deflated using the NBER four-digit SIC shipments deflators,  $L_{pt}$  is the count of production or unskilled workers, and  $H_{pt}$  is the count of non-production or skilled workers.  $K_{pt}^M$  and  $K_{pt}^S$  are the separated machinery and structures capital stocks, respectively. The residuals from the regression above provide our TFP measure:

$$TFP_{pt} = \log(Y_{pt}) - \hat{\zeta}_{jt} \log(L_{pt}) - \hat{\gamma}_{jt} \log(H_{pt}) - \hat{\theta}_{jt}^M \log(K_{pt}^M) - \hat{\theta}_{jt}^S \log(K_{pt}^S) - \alpha.$$

The results in Table 8 show a uniformly negative and generally significant effect of the introduction of the good faith exception on TFP, though the effect is slightly attenuated when we control for plant effects. By contrast, the public policy exception appears to have a positive effect and the implied contract exception appears to have a negative effect, though neither is significant in any specification.<sup>30</sup> However, results from dynamic specifications, found in Appendix Table 3, show mostly negative coefficients for both leads and lags of the good faith exception, though the coefficients on the lags are substantially larger. The dynamic specification thus raises some question about a causal interpretation of the good faith effects on productivity, though the available evidence is mostly consistent with a reduction in TFP in the four years following adoption of the good faith exception.

Finally, Panel (b) of Table 8 explores whether the increase in capital investment following the introduction of the good faith exception found in Table 7 affected labour productivity. We estimate that labour productivity rose substantially (by 1 to 4 log points) following adoption of the good faith exception. This measured rise in labour productivity follows from the fact that both capital investment and non-production worker employment (Tables 5 and 7) rose after adoption of the good faith exception. Since our labour productivity measure does not adjust for the quality of labour inputs, the rise in raw labour productivity is likely to reflect a mixture of capital deepening and compositional shifts in labour quality. Thus, this finding is not at odds with the conclusion that the good faith exception reduced TFP. Results from dynamic specifications for labour productivity that control for plant effects (Appendix Table 7 of the working paper) show negative coefficients on the leads and positive though

<sup>30</sup> We also examined a cost-shares methodology to analyse TFP. Cost shares were estimated for three-digit SIC industries from the NBER productivity database (Bartelsman and Gray, 1996). Production worker, non-production worker, and materials and fuels cost shares are calculated relative to TVS; the cost share of capital is a residual such that the cost shares sum to one. The results of the TFP measure obtained using a cost-shares methodology are generally declining but more mixed. However, the cost-shares methodology presents several disadvantages:

- (1) the coefficients on the shares are out-of-sample estimates obtained using NBER data;
- (2) we cannot disaggregate between equipment and structures since the capital share is obtained as a residual; and
- (3) the cost-shares methodology assumes constant returns-to-scale in the production function and perfectly competitive input markets.

insignificant coefficients on the lags, suggesting that the good faith exception preceded the increase in labour productivity.

## 5. Conclusions

This article makes two contributions. The first is to exploit microdata to examine the effect of dismissal protection on establishment-level outcomes in a representative sample of employers. The second is to consider simultaneously the effects of this protection on job flows — where there are unambiguous theoretical implications — and on several other important (and mostly unstudied) margins of firm behaviour, including capital investment, labour productivity and total factor productivity, where the predictions of theory are less clear cut. We believe that the power of the analysis derives from the evidence that the adoption of one particular dismissal protection, the good faith exception to employment-at-will, reduced employment fluctuations in adopting states. These effects were largest in the first three years following adoption and diminished thereafter. This finding indicates that adjustment costs rose in the short run, a necessary condition for there to be an impact on economic efficiency.

The finding on employment fluctuations motivates us to analyse how this short-run rise in adjustment costs impacted firms' choices of capital and labour inputs, and ultimately, their productivity. The most surprising result of our analysis is that the increase in adjustment costs appears to have spurred capital and skill deepening — that is, firms raised capital investment and increased non-production worker employment. These changes in input choices led to a rise in measured (non-quality-adjusted) labour productivity and a decline in total factor productivity. This last finding is potentially quite important because, if correct, it provides confirmation that exogenous increases in adjustment costs reduce efficiency.

Our findings also present two unresolved puzzles. First, the adoption of the good faith exception appears to follow (likely by coincidence) a major investment downturn. This pattern reduces our confidence in the causal interpretation of the rise in capital investment following adoption of the good faith exception. The second puzzle is that the estimated positive effect of the good faith exception on employment levels is larger than appears plausible (albeit often imprecisely estimated). In light of these puzzles, we view our findings as suggestive but inconclusive. Though our data support the hypothesis that adoption of the good faith exception raises adjustment costs, the anomalous results for employment levels suggests a cautious interpretation of the findings until further evidence accumulates.

Our results have interesting parallels with those of a recent study by Acemoglu and Finkelstein (2005) of firm-level responses to changes in labour costs in the US hospital industry. Responding to a change in Medicare reimbursement policy in the 1980s that effectively increased the cost of labour relative to capital, Acemoglu and Finkelstein document that hospitals raised both their capital-labour ratios and the skill composition of their workforces. Acemoglu and Finkelstein suggest that this result may be explained by either capital-skill complementarity or technology-skill complementarity (assuming that new capital investments embed recent technologies), as in our discussion above. While the Acemoglu and Finkelstein findings are drawn from a distinctly different economic context than our study (i.e., a heavily regulated sector versus a

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relatively competitive sector) and exploit a different source of policy variation (i.e., employment subsidies rather than dismissal costs), the parallels with our findings for the effect of dismissal protection on the US manufacturing sector are nonetheless intriguing and deserving of further consideration.

## Appendix

Table 1

*Dynamic Effects of Employment-at-will Doctrines on LBD Manufacturing Absolute Annual Employment Changes, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE
Legal exception	(1)	(2)	(3)	(4)
$\Delta GF^{t+2}$	0.009 (0.010)	0.008 (0.011)	0.008 (0.009)	0.007 (0.010)
$\Delta GF^{t+1}$	0.017 (0.010)	0.016 (0.011)	0.017 (0.009)	0.016 (0.010)
$\Delta GF^t$	0.003 (0.009)	0.003 (0.010)	0.002 (0.009)	0.002 (0.010)
$\Delta GF^{t-1}$	-0.007 (0.009)	-0.009 (0.010)	-0.005 (0.008)	-0.006 (0.010)
$\Delta GF^{t-2}$	-0.004 (0.010)	-0.005 (0.011)	-0.002 (0.009)	-0.003 (0.010)
$\Delta GF^{t-3}$	-0.026 (0.011)	-0.027 (0.014)	-0.021 (0.011)	-0.023 (0.012)
$\Delta GF^{t-4}$	-0.006 (0.011)	-0.007 (0.013)	-0.005 (0.011)	-0.007 (0.012)
$\Delta GF^{t-5}$	-0.011 (0.008)	-0.012 (0.009)	-0.006 (0.008)	-0.008 (0.008)
$GF \text{ Lag } t-6$	-0.002 (0.008)	-0.006 (0.010)	0.000 (0.007)	-0.006 (0.009)
Obs.	21,418	21,418	21,418	21,418

*Notes:* Huber-White robust standard errors clustered on state reported in parentheses. Coefficients for the leads and lags of the implied contract and public policy exceptions are reported in the working paper.

## Appendix

Table 2  
*Dynamic Effects of Employment-at-will Doctrines on ASM Annual and Quarterly Employment Changes, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE	Plant FE, YR FE	Col. 5 plus State trends, SIC2-YR FE
Legal exception	(1)	(2)	(3)	(4)	(5)	(6)
<i>(a) ASM Absolute annual employment changes</i>						
$\Delta GF^{t+2}$	0.011 (0.011)	0.014 (0.010)	0.008 (0.011)	0.013 (0.010)	0.009 (0.010)	0.010 (0.011)
$\Delta GF^{t+1}$	0.006 (0.011)	0.010 (0.011)	0.005 (0.011)	0.010 (0.010)	0.004 (0.011)	0.007 (0.010)
$\Delta GF$	0.004 (0.006)	0.009 (0.007)	0.001 (0.005)	0.006 (0.006)	0.001 (0.006)	0.003 (0.005)
$\Delta GF^{-1}$	0.004 (0.006)	0.010 (0.007)	0.002 (0.006)	0.009 (0.007)	0.001 (0.006)	0.004 (0.005)
$\Delta GF^{-2}$	-0.001 (0.005)	0.005 (0.007)	-0.003 (0.005)	0.004 (0.006)	-0.004 (0.005)	0.000 (0.005)
$\Delta GF^{-3}$	-0.017 (0.006)	-0.010 (0.007)	-0.016 (0.007)	-0.008 (0.008)	-0.021 (0.006)	-0.013 (0.006)
$\Delta GF^{-4}$	-0.013 (0.007)	-0.005 (0.007)	-0.012 (0.007)	-0.004 (0.006)	-0.016 (0.007)	-0.009 (0.005)
$\Delta GF^{-5}$	-0.007 (0.007)	0.003 (0.006)	-0.005 (0.007)	0.004 (0.005)	-0.010 (0.007)	-0.002 (0.006)
$GF$ Lag $t-6$	0.001 (0.006)	0.015 (0.008)	0.002 (0.006)	0.015 (0.006)	-0.002 (0.006)	0.005 (0.005)
<i>(b) ASM Production worker quarterly churn</i>						
$\Delta GF^{t+2}$	-0.003 (0.011)	0.008 (0.007)	-0.005 (0.010)	0.006 (0.007)	-0.001 (0.011)	0.003 (0.007)
$\Delta GF^{t+1}$	0.009 (0.015)	0.024 (0.017)	0.006 (0.014)	0.020 (0.017)	0.011 (0.015)	0.015 (0.014)
$\Delta GF$	-0.026 (0.014)	-0.011 (0.013)	-0.027 (0.013)	-0.013 (0.012)	-0.025 (0.014)	-0.019 (0.008)
$\Delta GF^{-1}$	-0.017 (0.015)	0.000 (0.011)	-0.018 (0.013)	-0.002 (0.010)	-0.015 (0.015)	-0.009 (0.007)
$\Delta GF^{-2}$	-0.015 (0.014)	0.005 (0.011)	-0.011 (0.014)	0.006 (0.010)	-0.013 (0.014)	0.000 (0.008)
$\Delta GF^{-3}$	-0.029 (0.015)	-0.008 (0.011)	-0.025 (0.013)	-0.007 (0.010)	-0.027 (0.016)	-0.014 (0.007)
$\Delta GF^{-4}$	0.014 (0.017)	0.036 (0.011)	0.020 (0.016)	0.039 (0.013)	0.016 (0.018)	0.032 (0.010)
$\Delta GF^{-5}$	-0.002 (0.029)	0.021 (0.019)	0.003 (0.027)	0.022 (0.017)	0.000 (0.030)	0.015 (0.021)
$GF$ Lag $t-6$	-0.011 (0.014)	0.013 (0.013)	-0.009 (0.013)	0.011 (0.013)	-0.008 (0.014)	0.002 (0.007)
Obs.	135,937	135,937	135,937	135,937	135,937	135,937

Notes: Huber-White robust standard errors clustered on state reported in parentheses. Coefficients for the leads and lags of the implied contract and public policy exceptions are reported in the working paper.

## Appendix

Table 3  
*Dynamic Effects of Employment-at-will Doctrines on ASM Total Factor Productivity, 1976–99*

	State FE, SIC2 FE, YR FE	Col. 1 plus State trends	Col. 1 plus SIC2-YR FE	Col. 1 plus State trends, SIC2-YR FE	Plant FE, YR FE	Col. 5 plus State trends, SIC2-YR FE
Legal Exception	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta GF^{t+2}$	-0.006 (0.020)	-0.010 (0.016)	-0.005 (0.019)	-0.010 (0.015)	-0.008 (0.019)	-0.008 (0.011)
$\Delta GF^{t+1}$	-0.007 (0.017)	-0.010 (0.022)	-0.003 (0.016)	-0.008 (0.021)	-0.010 (0.019)	-0.008 (0.019)
$\Delta GF$	-0.006 (0.022)	-0.011 (0.026)	-0.008 (0.020)	-0.014 (0.025)	-0.007 (0.022)	-0.009 (0.022)
$\Delta GF^{t-1}$	-0.026 (0.020)	-0.032 (0.021)	-0.023 (0.020)	-0.031 (0.021)	-0.027 (0.022)	-0.027 (0.019)
$\Delta GF^{t-2}$	-0.016 (0.021)	-0.022 (0.020)	-0.012 (0.022)	-0.019 (0.020)	-0.019 (0.023)	-0.015 (0.019)
$\Delta GF^{t-3}$	-0.032 (0.018)	-0.040 (0.019)	-0.031 (0.019)	-0.039 (0.019)	-0.039 (0.020)	-0.037 (0.018)
$\Delta GF^{t-4}$	-0.036 (0.029)	-0.046 (0.027)	-0.035 (0.029)	-0.046 (0.026)	-0.042 (0.030)	-0.039 (0.023)
$\Delta GF^{t-5}$	-0.011 (0.031)	-0.022 (0.025)	-0.013 (0.031)	-0.025 (0.024)	-0.020 (0.033)	-0.019 (0.022)
GF Lag $t-6$	-0.016 (0.024)	-0.041 (0.022)	-0.014 (0.024)	-0.040 (0.021)	-0.014 (0.025)	-0.012 (0.017)
Obs.	110,881	110,881	110,881	110,881	110,881	110,881

Notes: Huber-White robust standard errors clustered on state reported in parentheses. Coefficients for the leads and lags of the implied contract and public policy exceptions are reported in the working paper. TFP is the establishment-level residual from a regression of value-added on four factors of production (production employment, non-production employment, machinery and structures capital) at the industry-year level.

MIT and NBER,  
Harvard Business School,  
University of Houston, NBER, CEPR and IZA

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## **Does Employment Protection Reduce the Demand for Unskilled Labor?**

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# Does Employment Protection Reduce the Demand for Unskilled Labor?

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Discussion Paper No. 1290  
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## ABSTRACT

### Does Employment Protection Reduce the Demand for Unskilled Labor?\*

Perhaps it does. We propose a model in which workers with little education or in the tails of the age distribution – the inexperienced and the old – have more chance of job failure (mismatch). Recruits' average education should then increase and the standard deviation of starting age decrease when strict employment protection raises hiring and firing costs. We test the model using annual distributions of recruits' characteristics from a 1975-95 panel of plants in Belgium, the Netherlands, Italy, the UK and the US. The model's predictions are supported using the Blanchard-Wolfers index of employment protection as well as our alternative index.

JEL Classification: J21, J83

Keywords: employment protection, labor demand, unskilled workers, firm panel data

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## 1. Introduction

This paper presents a model of the impact of employment protection legislation on the demand for unskilled labor, which we then test using data from a panel of firms. The model relies on lack of information on the part of firms about worker characteristics. This lack of information, combined with a posited greater likelihood of “failure” on the job of unskilled workers, makes firms choosy about hiring unskilled workers when employment protection laws raise dismissal costs. Acemoglu and Angrist (2001) first put forward this type of model to analyze the impact of disability discrimination legislation on the demand for disabled workers. The model provides a rationale for why employment protection *matters more* for less skilled workers<sup>1</sup>. The paper is therefore primarily concerned with the distribution of employment opportunities rather than overall employment levels.

Our concern with distributional issues follows the changing emphasis in the literature. The literature on labor demand began by taking a homogeneous labor assumption (starting with Nickell, 1986, then developed for example by Bentolila and Saint-Paul, 1994, and more recently by Blanchard and Wolfers, 2000). Such an assumption rules out looking for the differential impact of employment protection laws across skill groups. However, evidence has begun to mount that employment protection laws impact adversely on young workers (Scarpetta, 1996) and the long-term unemployed (OECD, 1999; Nickell and Layard, 1999, 3063), even if the majority workforce are little affected. A series of papers by Kahn (2000), Jimeno and Rodriguez-Palenzuela (2002), and Bertola et al (2004) analyzing 20-30 year panels of OECD country data find that young workers and older workers, particularly males, fare less well in high unionization and employment protection environments. Moreover, Modesto (2004) has provided a formal treatment of how youth and old-age unemployment may increase with employment protection legislation, particularly if wages are inflexible – or even increase due to increased insider power of incumbent workers. Our paper offers an empirical contribution to this debate, using firm-level data.

Our model emphasizes the inflexibility caused by employment protection law rather than that resulting from union bargaining (emphasised in Kahn, 2000, and Bertola et al, 2004). According to our management informants, union density within the firms had generally been stable over time; hence this factor can be taken as a fixed effect. In the empirical work, we control for union density at the national level, and for movements in average manufacturing wages (to pick up the pressure of national collective agreements). Whether our emphasis is appropriate can be tested on an empirical basis. In fact, as will be seen, our predictions for the employment protection variable are generally borne out.

The firms in our dataset have subsidiaries both in highly regulated countries such as Italy and Belgium, and less regulated countries such as the UK and US. Figure 1 contrasts the labor environments in two of these countries, Italy and the UK. There are striking differences in job opportunities for the unskilled worker categories such as the under 25s and the over 60s. As can be seen, the 20-24 unemployment rate in Italy is around 30%. This figure is three times that in the UK, despite Italy’s large training and subsidized work programs (bottom row). Correspondingly, the 20-24 employment/population rate in Italy is currently only about 40% and falling, while that in the UK is around 70%. Similarly, at the other end of the age

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<sup>1</sup> In a similar vein, Koeniger et al (2004), put forward a model in which employment protection reduces the firm’s outside option, so permitting unions to negotiate higher wages. Higher employment protection costs for unskilled than skilled workers should then mean that strict employment protection helps unions to reduce the skilled/unskilled wage differential – which they find. Our model provides a rationale for higher employment protection costs for unskilled workers.

spectrum, among over 60s, Italy offers few jobs, with an employment/population ratio of only 20%, compared to the UK's 35% (and a US figure of 45%). Admittedly, Italian over-60s might be content not to work – their low unemployment rate indicates little search for work, and Italy has large state-funded early retirement programs (OECD, 1996, 208). But the marked lack of jobs for older workers still needs explanation. The labor market in Italy evidently works well for prime-age groups, but not for others. This type of relatively uneven performance is the motivation for our paper.

Our use of firm-level data to test for employment protection effects is a form of “insider econometrics”, to use Ichniowski and Shaw's (2003) term. We use fieldwork interviews to generate a detailed understanding of recruitment in four multinationals with subsidiaries in the US and several European countries (see Daniel and Siebert (2003) and Morton and Siebert (2001) for similar cross-country company comparisons). This fieldwork is combined with detailed econometric hypothesis testing using the firm-level datasets we assemble. In particular, by tracking these firms over approximately a 20-year period we gain both time and country variation, which allows a fixed effects econometric framework to hold unobservables constant. The more usual aggregate country comparisons have problems of consistently defining employment and unemployment (for a survey, see Addison and Teixeira, 2003). Here, our data on recruits' characteristics are perhaps more consistent across countries, since age and education are easier to define and measure, and company personnel records form a common statistical source.

A study such as ours has to face the difficulties of measuring the force of employment protection legislation (on which, see Bertola et al, 2000). Further, we desire a time-varying measure. A well-known recent measure is that constructed by Blanchard and Wolfers (2000), based on the OECD's (1999) scoring of the strictness of employment protection legislation in member countries. We begin with this measure, as do Bertola et al (2004) and Koeniger et al (2004). However, sensitivity tests need to be conducted. For these tests, we have elected to use our own measure, which has been constructed independently of Blanchard and Wolfers, and uses somewhat different assumptions<sup>2</sup>.

To preview our results, we find that strict employment protection – both on the Blanchard-Wolfers measure and on ours – is associated both with higher average education and with less dispersion in the starting age of recruits. We interpret these results to mean that firms become choosier about hiring from the less educated as well as the young and old age groups, who are more of a risk than prime-age workers, when employment protection raises dismissal costs. The latter result might underlie the UK's comparatively healthy age dispersion of jobs shown in Table 1.

Our plan is as follows. In the next section, we present the model of labor demand, and discuss the econometric specification. In the third section, we discuss our data. In the fourth section we present the regression estimates. The final section offers a summary and conclusions.

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<sup>2</sup> There is also a time-varying measure of the strictness of employment protection legislation based on employer views (Di Tella and McCulloch, 2004), but this series is short, 1984-1990. Alternatively, there is a series on product market regulation (Nicoletti and Scarpetta, 2003) – which is related to labor regulation but, of course, is not the same.

## 2. The Model

Theory. We analyze the demand for unskilled and skilled production labor (excluding management grades). We proxy ‘skill’ by two characteristics: the starting age of recruits,  $A$ , and the education of recruits,  $E$ . These are the characteristics for which data is consistently available from personnel records in our study plants. We do not have data on the firms’ capital stock, and it is simplest to assume that capital stock differences are predetermined, and absorbed into the firm fixed effect.<sup>3</sup>

Let us begin with a revenue function,  $R$ , which we define as price,  $p$ , multiplied by efficiency units of labor,  $\ell$ . Hence total revenue is  $R = p \ell$ . We assume that efficiency units of labor are linearly related to the number of workers,  $L$ , multiplied by a worker efficiency function  $g(A, E)$ , as follows:

$$\ell = Lg(A, E) \tag{1}$$

with  $g_A \gg 0$ ,  $g_{AA} < 0$ ,  $g_E > 0$ ,  $g_{EE} < 0$ , and  $g_{AE} > 0$  (to allow substitution between  $A$  and  $E$ ).

Let us explain our assumptions for the efficiency function, taking first the starting age ( $A$ ) argument. We make the efficiency of labor an inverted-U function of recruits’ starting age. Our reasoning is that young recruits (under 25) have less experience, and hence can be expected to be less skilful, given education. Older recruits (over 55) also have disadvantages, perhaps out-of-date skills or negative selection, in that an older worker looking for a job may have proved unsatisfactory in previous work. It is thus possible to have “too much experience”. This assumption is motivated by the fall-off in employment/population rates for older workers shown in Table 1 – but, in any case, it is generally accepted that most firms do not hire older workers (for discussion, see Heywood et al, 1999). The worker efficiency function, measured in product price ( $p$ ) terms, is given in Figure 1, with  $g_A$  starting  $> 0$ , and becoming  $< 0$ , and with  $g_{AA} < 0$ . Admittedly, careful hiring and training procedures within the company can reduce the curvature of the  $g$  function, at a cost. Also, in some cases, for example in firms which emphasize training, the curvature will perhaps be more pronounced because older workers are less trainable. All we need for our argument is some degree of curvature, so that there is a starting age range which the firm prefers as in Figure 1.

As for the role of education in the efficiency function, the efficiency of labor obviously increases with education, though at a decreasing rate, as shown in Figure 2. Again, as with starting age, the impact of education on worker efficiency will depend on the firm’s hiring and training expenditures, which we set to one side for the moment.

Consider next the element of labor force adjustment: quits, dismissals, layoffs (redundancies), and hires. To simplify, we assume the firm is in a steady state with  $L_t = L_{t-1}$ , so there are no layoffs, and the hiring rate,  $h$ , just balances the quit rate,  $\delta$ , plus the dismissal rate,  $\theta$ , i.e.:

$$h = \delta + \theta \tag{2}$$

Dismissals are central to our model. All workers face some probability of failing, and hence of dismissal. Failure can be thought of as stemming from mismatch between the worker and the job. However, since more is known about skilled workers – who are better

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<sup>3</sup> Admittedly, an increase in capital usage over time, in response to employment protection, could also account for recruitment of more skilled workers. Our empirical findings for the employment protection variable would then simply have to be interpreted as reduced forms.

educated and prime-age – their probability of failure is lower. Hence, dismissal rates should be lower for skilled than unskilled workers. Accordingly, we make the dismissal rate a function of  $A$  and  $E$ , i.e.:  $\theta = \theta(A, E)$ . We assume  $\theta$  follows a U-shape, being least during the prime age range, so  $\theta_A > 0$  and  $\theta_{AA} < 0$ . On the other hand  $\theta_E < 0$  because the more educated have a lower failure probability.

Dismissals bring firing costs,  $F$ , and expected firing costs are  $\theta F$ . We will assume  $F$  is the same throughout the production worker group, whether skilled or unskilled. ( $F$  costs would, of course, be higher for management grades but these are not included in our study.) Since unskilled workers are more likely to be dismissed, their expected firing costs will therefore be greater than those of skilled workers, and employment protection legislation will increase such costs more for unskilled workers.

Hiring costs,  $H$ , are also relevant. Hiring and firing costs tend to move together, because firing costs bring ‘shadow’ hiring costs (Bentolila and Bertola, 1990, 391). Thus, as it becomes more difficult to fire workers, more must be invested in hiring costs – choosing the appropriate worker. This effect is likely to be greater for unskilled workers, who are untried workers without a track record, once employment protection legislation makes it difficult to substitute an unsuitable worker with a suitable one (Saint-Paul and Kugler, 2000, 8). In other words, strict employment protection raises the possibility that a job can become permanently filled by a sub-standard worker. This possibility imposes an opportunity cost on the firm: the lost value of the option of filling the vacancy with an able worker. This type of expected opportunity cost must be higher for untried candidates without track records or qualifications.

In practice, therefore, we can think of employment protection legislation as increasing the expected sum of hiring and firing costs,  $\theta V = \theta(H+F)$ . The dashed lines in Figures 1 and 2 show worker efficiency net of expected hiring and firing costs. Employment protection legislation will increase the divergence between the two lines by increasing  $V$ .

Finally, wages will also be a function of  $A$  and  $E$ , i.e.  $w = w(A, E)$ . The wage function need not be the same as the worker efficiency function, though the two will be related. Obviously, wages increase with education, so  $w_E > 0$ . However, equity considerations, or trade union pressures, are likely to prevent much variation of wages with recruits’ starting age, hence for simplicity, we assume  $w_A = 0$ . For simplicity, we have made wages independent of  $V$  – though as Modesto (2004) and Koeniger et al (2004) point out, higher  $V$  could be associated with higher  $w$  since protection of incumbent workers raises their bargaining power. We will return to this subject below.

The firm aims to choose  $L$ ,  $A$ , and  $E$  to maximize the present value of profits,  $N$ , defined as the value of output minus wage, hiring and firing costs. We write the objective function as follows:

$$N = \sum_{t=0}^{\infty} \beta^t [pL_t g(A_t, E_t) - w(A_t, E_t)L_t - F\theta(A_{t-1}, E_{t-1})L_{t-1} - H(\delta + \theta(A_{t-1}, E_{t-1}))L_{t-1}] \quad (3)$$

where  $\beta = (1 + r)^{-1}$  is the discount factor with  $r =$  discount rate, and  $p =$  product price. We assume  $L_0 = 0$ . The third term in square brackets gives total firing costs which depend on the number of workers dismissed last period,  $\theta(A_{t-1}, E_{t-1})L_{t-1}$  times  $F$ . The fourth term gives hiring

costs, which depend on the quit and dismissal rates (substituting from equation (2) above) times  $H$ .

We derive the first order conditions for equation (3) following Acemoglu and Angrist (2001, 922), with firms immediately adjusting to steady state employment levels, so  $L_t = L$ ,  $A_t = A$ , and  $E_t = E$  every period. We also assume that it takes a year for any  $H$  or  $F$  costs to arise. We can then simplify (3):

$$N = pLg(A,E) - w(A,E)L + \frac{\beta}{1-\beta} [pLg(A,E) - w(A,E)L - F\theta(A,E)L - H(\delta + \theta(A,E))L] \quad (4)$$

since  $\sum_{t=1}^{\infty} \beta^t = \beta/(1-\beta)$ . Differentiating (4) with respect to  $L$  gives:

$\partial N/\partial L = (pg(A,E) - w(A,E))/(1-\beta) - [F\theta(A,E) + H(\delta + \theta(A,E))]\beta/(1-\beta) = 0$ , so the employment level chosen satisfies the condition:

$$pg(A,E) = w(A,E) + \beta[F\theta(A,E) + H(\delta + \theta(A,E))] \quad (5)$$

As can be seen,  $L$  drops out of this condition, because of the linear form we have given the revenue function. The conditions for  $A$  and  $E$ , given below, are therefore in per-worker terms, with  $L$  determined outside the model.

For the age choice, we have:

$$\partial N/\partial A = L(pg_A - w_A) + \frac{\beta}{1-\beta} L(pg_A - w_A - \theta_A V) = 0, \text{ where } V = F + H.$$

Hence,  $pg_A = w_A + \beta\theta_A V$ . (6)

In other words, the marginal revenue product of labor by starting age must equal the “full” marginal cost of labor by age, including expected hiring and firing costs. In terms of Figure 1, where we have chosen a simple flat wage-age line, the choice of starting age,  $A^*$ , is given by the maximum of dotted  $pg(A, \bar{E}) - \beta\theta V$  line.

There is a similar condition which the optimum education choice,  $E^*$ , must meet:

$$pg_E = w_E + \beta\theta_E V. \quad (7)$$

Figure 2 illustrates the position.

It is also necessary to consider the possibility of substitution between education and starting age, as shown in Figure 3. The positively sloped section of the isoquant indicates the region where starting age is too high, reducing worker efficiency. The firm will always aim to operate to the left of this point, the “ridge line” – though in practice the line will not be well defined, since the worker age-efficiency function in Figure 1 will have a broad top. With no employment protection, cost minimization requires the factor combination indicated by point  $X$ .

Now let us consider the impact of employment protection – higher  $V$  costs – on selection of worker characteristics. From (6) we see that  $V$  can increase or decrease the marginal cost of older workers, depending upon whether  $\theta_A$  is  $< 0$  or  $> 0$  (see Appendix 1). But since  $\theta_A$  is likely to be small, we would not expect employment protection legislation to much affect the average starting age that management selects – though there may be some fall since education substitutes for age, and education is likely to increase, see below. However, strict employment protection legislation will reduce the dispersion of starting ages. This effect can be seen most simply from Figure 1. Raising  $V$  increases the curvature of the

dotted pg  $(A, \bar{E}) - \beta\theta V$  line. With a low  $V$ , the line is not very curved, so the firm will be indifferent about  $A$ , because the penalty associated with worker failure due to choice of the wrong starting age,  $\theta_A$ , will be low. Now suppose  $V$  increases. When this happens, it will become more important for the firm to ‘get it right’, that is, to choose specifically the prime age group for which  $\theta V$  is lowest. Thus, high  $V$  should reduce the dispersion of  $A$ .

The position is different for education, in equation (7). Here, we see that an increase in  $V$  lowers the marginal cost of a more educated worker, because  $\theta_E$  is negative (Appendix 1). Stricter employment protection legislation should therefore unambiguously tilt management decisions in favor of more educated recruits. Consequently we predict an increase in recruits’ average education as  $V$  increases. Moreover, as Figure 3 shows, an increase in  $V$  is likely to make the full cost of education cheaper relative to starting age, leading to substitution of education for starting age, and a movement from  $X$  to  $Y$ . At the same time, unlike the case for starting age, there is no reason to expect increases in  $V$  to reduce the dispersion of recruits’ education. Dispersion depends on the penalty associated with making the wrong education choice, which in turn depends on the curvature of the  $g$ ,  $\theta$  and  $w$  functions. However, the curvature of these functions does not depend upon  $V$ .

Our predictions for the impact of employment protection legislation on our two characteristics,  $A$  and  $E$ , thus form an interesting contrast. Strict employment protection legislation (high  $V$ ) should leave the average  $A$  of recruits undisturbed, but lower the dispersion of  $A$ . Exactly the converse should be true of  $E$ .

Admittedly, in deriving these results we have adopted certain simplifications. In particular we have ignored the possible countervailing impact of high  $V$  in raising worker efficiency – in particular, the possibility of an  $H$  argument in the  $g(A, E, H)$  function. In other words, greater hiring expenditures,  $H$ , could so stimulate (via better choice) the productivity of uneducated workers as to offset the costs associated with their higher probability of failure. However, it is implausible that such a full offset should occur. If it did, why did not management choose higher  $H$  in the first place, without being forced by employment protection legislation? In any case, we subject the matter to test below.

Specification. We form the observations for the average and dispersion of recruits’ starting age and education as follows. The analysis relates to male recruits whose contracts become permanent/open-ended within a year at the plant, since our best continuous data series relate to this group. For each of the eleven plants in each year (the plants are described in more detail below), we calculate the mean and the standard deviation of recruits’ starting age and education. The data points thus represent average behavior for each plant in each year.

This method reduces the data on some 2,400 recruitment events to approximately 140 plant-time data points, depending upon missing values. We use arithmetic weights in our estimation procedures, with weights based on the number underlying each plant’s distribution in that year, to allow for the fact that sometimes the number hired in a year is small.

Our statistical model in its general form is:

$$Q_{it} = \sum_{i=1}^{10} a_i + \sum_{i=1}^{10} b_i t + \sum_{i=1}^{10} c_i EPL_{it-1} + \sum_{i=1}^{10} d_i X_{it-1} + e_{it} \quad (8)$$

Where  $Q_{it}$  = the average or standard deviation of recruits' education or age in the  $i$ -th plant in the  $t$ -th year,  $i = 1, 2, \dots, 10$ ,  $t$  = time trend;  $a_i$  = constant term for the  $i$ -th plant;  $EPL_{it} =$

employment protection index in the  $i$ -th plant's country and  $t$ -th year;  $X_{it}$  = a vector of other controls;  $e_{it}$  = the error term. This model is completely unrestricted, with different coefficients for each plant. We then use F-tests to test whether it is permissible to restrict some or all of the coefficients to equality. This F-test procedure can be used to test whether, for example, the coefficients of the UK plants as a group can be restricted to equality – or whether some other grouping is permissible, for example, of sister-plants.

A restricted form of equation (8) is

$$Q_{it} = \sum_{i=1}^{10} a_i + bt + cEPL_{it-1} + dX_{it-1} + e_{it} \quad (9)$$

This is the basic fixed effects form, with only the constant fixed effect term,  $a_i$ , differing among plants, all other coefficients being the same. F-tests generally show that we can accept the restrictions implicit in (9).

In equation (9), the fixed effects,  $a_i$ , are meant to account for omitted variables specific to the firms, but which are constant over time. For example, plants in richer countries such as the US should have access to a supply of better-educated workers, which will obviously affect hiring decisions. By contrast, the time trend variable,  $t$ , is intended to capture effects specific to each time period, and the same across firms. An example of such effects is the reduction in unskilled labor demand such as might result from international trade competition and/or skilled-labor-using technical progress, to which all our plants have presumably been subject.

A further point is the simultaneity of starting age and education. Education and starting age will tend to be substitutes, at least when younger workers are hired. (The standard deviations of starting age and education are simpler – we can take these variables to be independent of each other, and also of the average values of starting age and education.) In fact, as we shall see, the system seems to be recursive<sup>4</sup>. First, the firm chooses recruits' education independently of starting age. Then, second, the firm chooses starting age dependent on education, and the two turn out to be good substitutes. To address this issue, we use simultaneous equations techniques to estimate the average age and average education equations.

#### Measuring employment protection.

As we have already noted, it is difficult to capture a many-dimensional force such as employment protection in a single time-varying variable (Bertola et al, 2000). Firing costs are influenced by many rules governing unfair dismissal, layoffs for economic reasons, severance payments, minimum notice periods, administrative authorization for dismissals, and prior discussion with representatives of unions or labor market administrations. In addition, for the US in particular, there is judge-made law raising the costs of dismissal (Autor, 2003), even though there are weak statutory provisions.

Nevertheless, some progress has been made. Specifically, Blanchard and Wolfers (2000) have constructed cardinal measures of the strictness of employment protection legislation for several countries; including the ones we are interested in here. Their measure is based on the OECD's country rankings of strictness of employment protection in the 1980s

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<sup>4</sup> A recursive model may be consistently estimated using equation-by-equation ordinary least squares (Greene, 2003, 397), but not if the covariance matrix of the equation disturbances is non-diagonal, as appears to be the case for some of our specifications.

and 1990s (OECD, 1999). They then use the index developed by Lazear (1990), who quantified firing costs as the amount of severance and notice period measured in monthly wages owed to a dismissed worker after 10 years of service, to stretch the series back to the 1970s.

The resulting index for our time period is shown in Figure 4. As can be seen, it ignores possible increasing US case-law strictness of protection. It also ignores the UK's decrease in strictness under Thatcher's Conservative administration. However, on the good side, the index aims at a cardinal measure of dismissal costs (it does not simply rank countries), it covers the countries and the time periods we need, and it is independent of our own data calculations. Therefore, we use this index (as have Bertola et al (2004) and Koeniger et al (2004)) as a foundation.

We will also subject the results to sensitivity tests, and in particular demonstrate results using our alternative index of employment protection. Our index is based on somewhat different assumptions to the Blanchard-Wolfers index. It is also based on the OECD (1999) method, but for our US states, it incorporates both changes in legislation, and in relevant court practices. For the US, exceptions from the employment-at-will doctrine introduced in the majority of US states throughout the past two decades may increase employment protection – not via legislation but rather the threat of potentially costly litigation – which we have calibrated using the Rand study on termination litigation in California (Dertouzos et al., 1988).<sup>5</sup>

The resulting index is shown in Figure 5. The marked difference between the two indices in the treatment of the US can be seen. Our index gives strictness of employment protection at the state level, and also shows an increase of employment protection based on case law, while the Blanchard-Wolfers index does not. There are other detail differences as well. Thus, allowing for country fixed effects, our index only explains 0.46 of the Blanchard and Wolfers index, so the two indices are reasonably different.

The controls. Let us now turn to the control variables,  $X$ . In the first place, our plants produce four different products, and we may expect these to have different requirements for high skilled relative to low skilled workers. The plant fixed effect term helps to control for this factor. In addition, our plants can be formed into groups producing the same product (as subsidiaries of the same multinational), which allows further control.

A wage variable is also needed. Although in the development of our model we abstracted from wage effects, wages may rise if employment protection shelters incumbent workers, and so unions push up their wages (e.g., see Modesto, 2004). Since it is unskilled workers who are at risk, a measure of wage compression would be best, but this variable is not available over time. Hence, we simply include the average hourly manufacturing wage. Increases in this variable should have employment protection-like effects, causing firms to

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<sup>5</sup> Our index is constructed based on the OECD (1999) index for individual dismissal of workers with regular contracts, applying OECD weights. It includes scores for procedural inconveniences (procedures and delay to start notice) notice and severance pay for no-fault individual dismissal and difficulty of dismissal (definition of unfair dismissal, trial period, compensation and reinstatement). It is then combined with an index of the strictness of regulation of temporary employment, again based on OECD (1999), and smoothed over time.

become more choosy, and so increasing education requirements, and reducing the standard deviation of starting age.

Similarly, strong unions are likely to play a role in promoting and enforcing employment protection and other labor regulation, as well as in pushing up wages generally, all of which will tilt labor demand in favor of skilled workers. Again, this effect should be seen in a decrease in the starting age standard deviation, and an increase in the education average. As noted above, union density at the plant level is not available over time, so we make do with national-level figures.

We also include the tax wedge for the country (total taxes divided by GDP), on the argument that when taxes increase labor cost, this may reduce the relative demand for unskilled workers. This argument requires wage inflexibility; otherwise tax increases will be shifted back toward the worker, with little effect on labor demand.

A further variable is unemployment. For example, it might be that in bad times, the relative demand for unskilled workers decreases, since firms tend to hoard skilled labor then (Reder, 1955; Devereux, 2000). Conversely, in good times, skilled labour takes time to train, so firms must take unskilled workers, and the relative demand for unskilled workers increases. However, for our firms there might also be counteracting cyclical shifts in unskilled labour supply<sup>6</sup>. Our firms are mainly in non-durable manufacturing which has less cyclical employment variation than durable (McLaughlin and Bils, 2001). Thus, in slack times many unskilled workers will be searching for a job in non-durables (they are laid off from durables), causing a relative fall in unskilled wages and maintaining unskilled recruitment in non-durables. To allow for such effects, we incorporate as controls both the plant's employment deviations from trend, and also the national unemployment rate.

### 3. The Data

The sample includes data from four major manufacturing multinationals, most with plants in the US, the UK, and a country in continental Europe. The companies were chosen because they had subsidiaries in both regulated and unregulated countries, were large enough to regularly hire workers, and had 15-20 years past personnel record data. The industries involved are ice-cream manufacturing (Italy, the UK, and Missouri for the US), distilling (Italy, the UK, and California for the US), food processing (Netherlands, the UK, and Maryland for the US) producing mainly margarine, and pharmaceuticals (Belgium and the UK) producing penicillin products (for details, see Daniel and Siebert, 2003).

Basic employment and labor costs data for the resulting sample are given in Table 2. As can be seen from the table, labor costs per production worker tend to be lowest in the UK plants. The pharmaceuticals pair shows the biggest difference; with labor costs in the Belgian plant being more than twice UK costs, due to higher Belgian labor taxes and extended collective agreements. Nevertheless, unit labor costs are similar in the two plants (\$165 to \$175 per \$000 sales) indicating that the Belgian plant is securing a level of labor productivity which is twice as high as that of its UK counterpart. We would expect such differences to feed through to the hiring process, with the Belgian plant concentrating more on prime-age, educated workers than its UK counterpart.

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<sup>6</sup> For an early discussion of how supply shifts may affect relative wages and employment, see Perlman (1958).

Table 2 also shows unit labor costs appear to differ quite widely for the distillers' plants (from \$0.049 to \$0.099 per liter), and food processing plants (\$49 to \$74 per ton), which may undermine the competitive assumption (the more expensive plants should have been eliminated over time). However, it is difficult to calculate the labor productivity factor underlying unit labor costs. Moreover, the exchange rates used are problematic. Therefore, we believe that these differences should not be taken as strong evidence against the competitive assumption.

Information on mean values of the labor demand variables is given next, in Table 3. The first row shows that the data period is about 20 years, 1975-95, in most cases, though the ice-cream plant in Italy yielded only 12 years of observations, 1985-97. Hence, we have achieved a serviceable time series. Admittedly, the following rows show that the average number of hires per year is quite low in some plants, so the means and standard deviations will be unreliable<sup>7</sup>. To help circumvent this problem, as noted above, we use the underlying number of observations as arithmetic weights.

As for the starting age variable, the mean values are in the late twenties for most plants. Thus, school-leavers are generally not hired<sup>8</sup>. The high starting age values show the emphasis on previous experience amongst this group of large plants. Nevertheless, the standard deviation of starting age is smaller in plants in Italy, the Netherlands and Belgium, where employment protection legislation is stricter, as expected.

The education variable rows show the US plants to have highest average education, at around 12 years, almost 2 years higher than the Italian plants. At first glance, this pattern runs counter to our hypothesis that strict employment protection should result in more emphasis on education. However, country laws on the school-leaving age, which is low in Italy, could affect the average – as well as differences in country wealth. These factors should be picked up in the fixed effect (in addition, there have been changes in school-leaving laws, for which we include a school-leaving age dummy). Table 3 also shows the standard deviation of education of new hires, which varies from 1 to 2.5 years. There is no particular pattern in the cross section, comparing countries, nor do we expect any. We will now explore these relationships more systematically.

#### 4. Results

The main results: The main results are given in Table 4. For each dependent variable, we report results using the Blanchard-Wolfers index as well as our index. Since it is necessary to pick up plant-specific unobservables, as noted above, we include fixed effects in all specifications. F-tests show that we can assume the same coefficients for all plants, apart from the fixed effects. Although we experimented with various groupings based on plant ownership, these were not significant.

Estimation of the standard deviation equations is by ordinary least squares using underlying observations as arithmetic weights. However, because we expect starting age and

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<sup>7</sup> For consistency over time, we concentrate on permanent males, defining “permanent” to include workers whether hired on a temporary basis or not, who became subsequently employed on an open-ended basis within a year. Where such hires fell below 2 in any year, we recorded a missing observation.

<sup>8</sup> However, an exception is the Italian distilling plant, which has starting age averaging only 23.7. Special factors seem to be operative in this plant, which recruits extensively among relatives of current employees. Such extra knowledge of applicants could allow age and education criteria to be lowered. Again, we rely on the fixed effects term in (9) to control for these special factors.

education to be determined jointly, the average age equation and the average education equation are estimated as simultaneous equations by three stage least squares, again including underlying observations as arithmetic weights.<sup>9</sup> In fact, as shown by the Durbin-Wu-Hausman test, average age is endogenous in the education equation (column 5) while average education is exogenous in the age equation (column 1) using the Blanchard-Wolfers index. It thus appears that we have a recursive system, with the personnel office making a decision first on an applicant's education, which is then traded off against starting age.

On the other hand, using our own index (columns 2 and 6), both education and age appear to be exogenous, which is puzzling since we expect simultaneity. However, at least this result means that we can use ordinary least squares, which provides a cross-check on the results using three stage least squares. (As a further cross-check, we also give in Appendix 2 reduced form equations for average starting age and education. ) The important point, as we will see, is that average education responds significantly positively to employment protection, whatever the specification.

Findings for employment protection are given in the top two rows. For the average starting age variable using the Blanchard-Wolfers index (column 1), the coefficient on employment protection, -1.60, is negative, but insignificant. If we use our own index (column 2), the coefficient on employment protection is also negative and insignificant, -0.50. These findings are in accordance with our model, which does not predict a strong link between employment protection and recruits' average age. At the same time, we see that education is strongly substitutable for starting age, which is plausible. This result is most marked using the Blanchard-Wolfers index: a one -year increase in recruits' education is associated with a 3.25-year decrease in starting age. Personnel offices evidently trade off education against starting age.

Turning to the standard deviation of starting age, we see the predicted contrast. Employment protection legislation significantly reduces the standard deviation of starting age in both specifications. This reduction is most marked using the Blanchard-Wolfers index (column 3), with a coefficient of -9.12. This reaction is in line with our model's predictions. The elasticity, taken at the means, is  $-0.99$  ( $= -9.12 \times 1.0/9.2$ ). Thus, moving Italy's employment protection level from 4 down to the average of 1, a change of  $-120\%$  ( $= (1-4)/\frac{1}{2}(1+4)$ ), would imply an increase of almost 120% in the standard deviation of starting age. Such a change would widen Italy's age standard deviation to about 11 years – approximately UK levels (Table 3). Using our own index (column 4), employment protection still significantly reduces the standard deviation of starting age, though to a lesser extent. Here the elasticity is  $-0.53$  ( $= -3.73 \times 1.3/9.2$ ), which implies moving Italy's employment protection level down to the average, would widen Italy's age standard deviation to about 8 years.

Turning next to average education, there is the predicted opposite pattern in both specifications. Using the Blanchard-Wolfers index (column 5), average education responds significantly to the employment protection index, with a coefficient of 2.35. The elasticity is 0.21 ( $= 2.35 \times 1.0/11.4$ ). This elasticity is smaller than that for the standard deviation of starting age, but this is appropriate since education levels cannot vary much. Thus, moving Italy's employment protection level once again by  $-120\%$  would imply a reduction of 25% in

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<sup>9</sup> The instrument we used for education was the school-leaving age variable, which can reasonably be excluded from the age equation. The instrument we used for starting age was the average age of the company's worker stock which, for its part, can reasonably be excluded from the education equation.

the Italian firms' education levels, which is quite enough (given Italy's already low education levels). Using our index (column 6), the elasticity is, 0.17 ( $=1.47 \times 1.3 / 11.4$ ), implying a reduction of about 20% in the Italian firms' education level if Italy's employment protection level moves down to the average. The positive link between employment protection and average education remains in the reduced form specification (Appendix 2).

Finally, the last two columns show that the standard deviation of education does not respond significantly to employment protection using either measure. This result is also consistent with our model, which makes no predictions for the standard deviation of education.

The pattern of results for the remaining variables also gives confidence in the model, though the results are somewhat stronger using the Blanchard-Wolfers index. Thus, when using this index, the time trend variable (column 3) shows that the standard deviation of starting age has been trending downward, at  $-0.34$  years per year. At the same time, the average education of recruits (column 5) has been trending significantly upward, at 0.08 years per year. (The education trend is not simply a consequence of the school-leaving age increase that occurred in some countries during the period, since we have the school-leaving age control, which is significant.) These results are sensible. They indicate that management has been becoming choosier over the years, raising education, and more tightly defining starting age, which could reflect global competition and/or skill-using technical progress raising skill requirements.

The main other significant controls are for business conditions, that is, the unemployment and deviations from employment trend variables. Both variables point to a rise in recruiting standards when business is good. Thus, we see that lower unemployment is linked to an increase in average education. Similarly, a positive employment deviation from trend is linked to a reduction in the standard deviation of starting age. The simple argument, as we noted above, is for good business conditions (low unemployment) to favor lower recruitment standards, as firms run out of hoarded skilled labour. However, as we also noted above, supply shifts could explain our contrary findings, since few unskilled workers may be looking for jobs in non-durable manufacturing when unemployment is low, given the likely strong expansion in (better-paying) durable manufacturing at such times. Scarcity of unskilled workers could thus explain the apparent rise in recruiting standards in our sector when times are good.

The union density and the tax wedge variables produce mixed results. We argued above that both should have employment protection-like effects. Hence, we would expect negative coefficients on these variables in the standard deviation of starting age equation, and positive in the average education equation. Using the Blanchard-Wolfers index, union density significantly reduces the standard deviation of starting age, as expected, but it is insignificant in the average education equation. Using our index, the coefficient on union density is insignificant in both equations. However, our union density data are at the country level, not the plant level, since a time series of union density at the plant level is not available. Most of the plants had closed shops even in the 1990s (over 90% union density – see Table 2), so union density is likely to have been pretty constant over time, making our country series inappropriate. As for the tax wedge, this variable is significantly positively linked with average education as expected. However, it is insignificant in the age standard deviation equation, in both specifications. The effects of union density and the tax wedge are not clear cut, therefore, though some results go in the expected direction.

Finally, the manufacturing pay variable is trying to be significant in the expected directions. In other words, there are signs that personnel offices become more choosy when manufacturing pay levels are high, so recruits need to be more educated, and at the same time the standard deviation of starting age tends to fall.

Sensitivity tests: First, we exclude the three US plants, and look only at plants in the European subset of countries using both indices. This test aims to show whether these employment protection results are robust to a big change of sample. In addition, the test circumvents the possible problems of the Blanchard-Wolfers US employment protection index, which omits judge-made employment protection (see above).

Summary results are given in Table 5, Panel A<sup>10</sup>. We report the coefficients of both the employment protection indices and the time trend, the time trend being interesting because it should show a common country tendency towards a shrinking market for unskilled labor. Taking first Blanchard-Wolfers employment protection measure in the upper panel, the first row repeats Table 4's results for reference. The second row gives the results for the Europe-only sample. We see the same pattern: higher employment protection reduces the standard deviation of starting age, and increases average education, leaving the other two dependent variables unaffected. Hence our results are not much affected by the change in sample. Turning to our own measure, the pattern does not hold for the standard deviation of starting age equation for the Europe only sample. Hence, changing the sample size gives more confidence in the Blanchard-Wolfers measure.

Now turn to the time coefficients in the second row. The main feature here is that both employment protection indices produce a significant negative time trend for the standard deviation of starting age, and a significant positive time trend for average education for the overall sample. These findings indicate that management has been becoming choosier over the years, which could reflect global competition raising skill requirements, as noted above. However, using either index, there is no significant time trend in the Europe-only sample. Increasingly stringent hiring standards appear only to affect the US plants over this time period, according to this specification. This result could be due to the fact that US plants have had more room to raise their standards as global competition bites – standards in continental European plants already being quite high.

Our second test groups observations into 5-year averages, as shown in Panel B. The advantage of such grouping is that the number of observations underlying the dependent variables (means or standard deviations) is increased, so weighting is unnecessary. Also, reducing the number of datapoints per plant to 3 or 4 over time might more truly reflect the amount of information we have on employment protection, given that the indexes are static for long periods at a time. As can be seen, there is still a negative link between employment protection and the standard deviation of starting age, though the elasticity is reduced to about  $-0.2$ . Also, there is still a positive link between employment protection and education, this time with an increased elasticity of 0.64 to 0.85. However, in this formulation there is now a positive link between employment protection and the standard deviation of education, which is not expected by our theory. Nevertheless, the main results survive.

Our final test probes the employment protection indices. Specifically, we test for the strength of the association between both measures of employment protection and average

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<sup>10</sup> Full details are available from the authors on request.

worker tenure in the plants. Our argument here is simply that high tenure in a plant should indicate high employment protection in that plant. The tenure variable is constructed using the average tenure of the workforce in a given year. Admittedly, average plant tenure changes only slowly in response to changes in the legal environment. Nevertheless, we think the exercise can still provide a check on the indices.

The results are given in Table 6, which shows a strong association between employment protection and plant tenure using the Blanchard-Wolfers index. The association is somewhat weaker using our alternative index. The coefficient on employment protection using the Blanchard-Wolfers index is 9.64 and highly significant, implying an elasticity, taken at the means, of 1.09 ( $=9.64 \times 1.3/11.5$ ). While labor turnover is not the focus of our inquiry, both equations behave quite well, with the expected negative link between plant employment deviations and tenure (positive deviations mean more hiring, and should lead to a lowering of average tenure), and positive time trend. However, the equation using our measure throws up a negative relation between union density and tenure, which is hard to explain. These results therefore give particular confidence in the Blanchard-Wolfers employment protection index.

## 5. Conclusions

This paper develops and tests a model in which employment protection costs can influence the type of labor characteristics demanded by employers. The model postulates that workers with little education, or in the tails of the age distribution, have more chance of failure (mismatch), and thus of imposing hiring and firing costs on the firm. Consequently, such workers are less likely to be recruited when strict employment protection raises hiring and firing costs. In particular, the model predicts that recruits' *average* education should increase and the *standard deviation* of starting age should decrease when employment protection becomes stricter. As Table 4 shows, our model's predictions are borne out using two alternative measures of employment protection, with the results being somewhat stronger using the Blanchard-Wolfers index. Strict employment protection indeed reduces the variability in starting age, and raises education requirements, independent of the employment protection measure used. Hence, there are strong indications that employment protection affects the steady-state distribution of recruits' characteristics – raising education requirements, and reducing starting age dispersion.

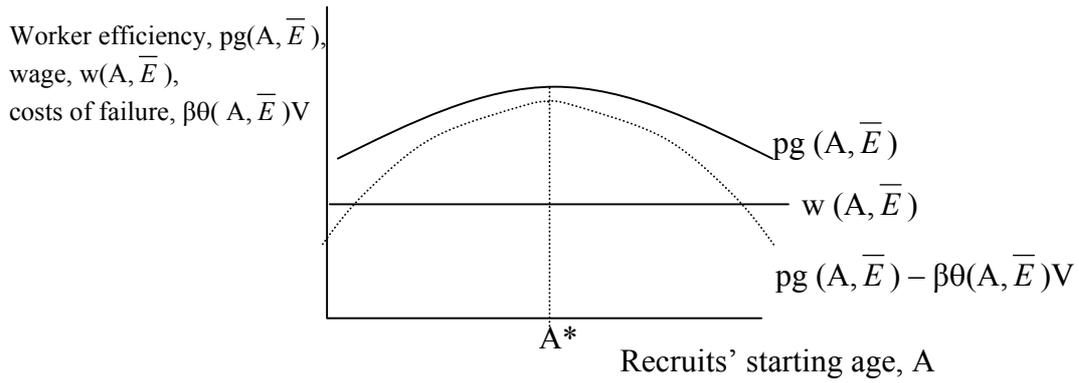
The adverse distributional impact of employment protection legislation, implied by our results, has become increasingly apparent from recent OECD country studies which disaggregate by age, as noted in the introduction. We offer a further disaggregation by education, and a different firm-based methodology to arrive at the same conclusion. Our study shows that employment protection is generally bought at a cost to the inexperienced, the old, and the uneducated – the have-nots.

Caveats and directions for further research must be noted. In the first place, our results depend upon the measurement of employment protection. We have shown that the employment protection indicators we use generally behave sensibly when explaining patterns of workforce tenure in our sample. That is, average worker tenure increases strongly in plants/time periods with strict employment protection (Table 6). The results also survive when we radically alter the sample by dropping all the US observations using the Blanchard-Wolfers index (but only partly using our index – see Table 5). Further work is necessary on measurement of employment protection. In particular, our post-1975 period has little variation in employment protection, since the system is essentially mature. A more powerful

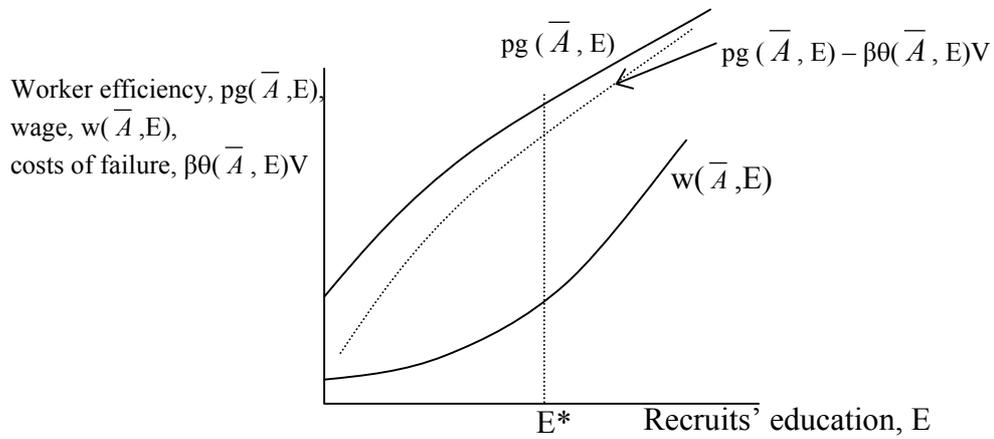
analysis would be possible with data extending back into the 1960s, when the continental European countries were setting up their employment protection measures – though it would be an unusual firm which kept personnel record data extending back so far.

A second point arises about the generalizability of our results. Our data are reasonably consistent across countries because they come from subsidiaries of four multinationals, which impose a reporting uniformity. Also, all the subsidiaries are in a similar industrial sector, nondurables manufacturing, and we consider the hiring only of males into contracts which are open-ended (or become so within a year). These restrictions reduce extraneous noise. However, small firms, the service sector (including government), and the market for temporary workers are all excluded from consideration. There is work to be done to fill this gap. In particular, it is important to understand how the increasing use of temporary contracts allows some firms to contract around employment protection and experiment with unskilled groups. The large company, industrial sector, to which our results apply, is only a small part of the whole.

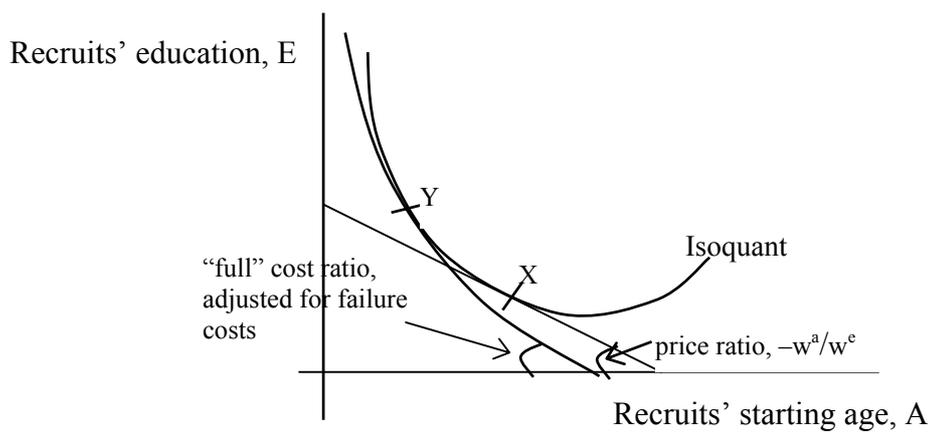
Nevertheless, our results show how employment protection legislation can influence recruiting decisions at the level of the company. Company time series studies bring their own difficulties in terms of missing information. However, the company is where the employment decisions are made. Rather than relying on country aggregates such as employment-population or unemployment rates, which are the subject of many factors, we are therefore able to provide specific tests of important employment decisions.



**Figure 1: Production worker efficiency and starting age (given education)**



**Figure 2: Production worker efficiency and education (given starting age)**



**Figure 3: Substitution between Education and Starting Age**

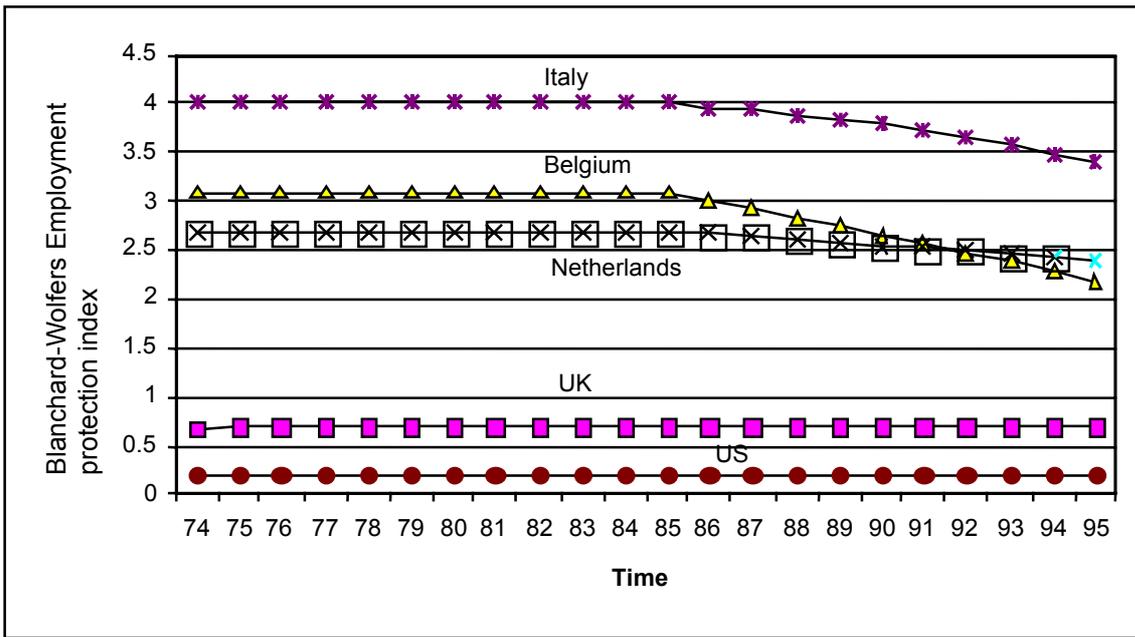


Figure 4: Blanchard-Wolfers Employment Protection Index

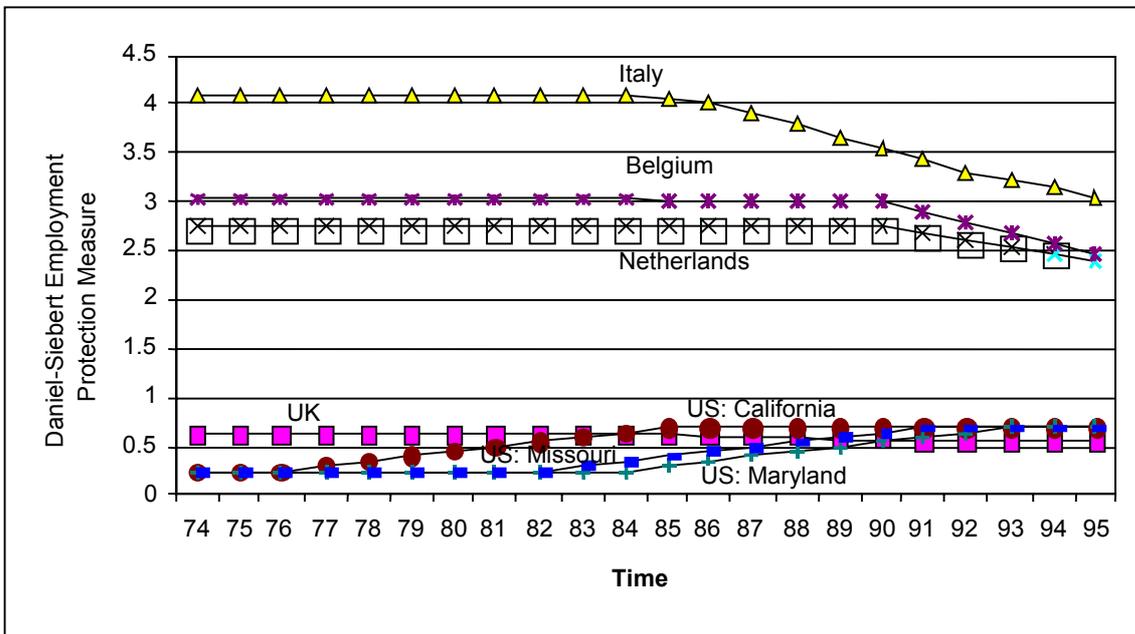


Figure 5: Daniel-Siebert Employment Protection Index

**Table 1: Labor Market Aggregates in Italy and the UK**

		Italy		UK	
		1985-90	1995-00	1985-90	1995-00
20-24 age group:	Unemployment	30	29	13	11
	Employment/population	47	40	72	69
25-54 age group:	Unemployment	7	9	8	5
	Employment/population	64	63	76	79
59-64 age group:	Unemployment	2	4	9	6
	Employment/population	22	18	34	35
Adult and youth training + subsidized employment, participants as % of laborforce		n.a.	7.3	n.a.	2.1

**Source:** OECD, 2001, tables on Standard Labor Market Indicators, and Public Expenditures on Labor Market Programs.

**Notes:** Unemployment, and employment/population are percentages, averaged for the periods 1985-90, or 1995-2000. All figures are for male and females taken together.

**Table 2: Labor in the Study Plants, Mid 1990s**

	Ice-cream			Distillers			Food Processing			Pharma- ceuticals	
	IT	UK	US	IT	UK	US	NL	UK	US	BL	UK
Employment, study plant <sup>a</sup>	824	828	298	146	314	121	359	385	199	305	861
% part-time	0	0	0	0	0	0	0	0	0	25	4
% temp.	18	24	24	15	14	4	2	12	12	9	3
% union	34	80	0	50	95	100	40	100	100	90	90
Average tenure (yrs)	--	12.1	4.8	15.8	9.0	9.3	10.5	11.8	10.8	7.9	10.2
Pay (\$000s) <sup>b</sup>	25.1	27.9	23.9	21.5	26.0	32.9	34.9	33.8	27.9	44.2	26.8
Labor Cost <sup>b</sup> per prod. worker (\$000s)	35.0	32.1	36.4	44.1	29.5	47.3	53.1	39.0	40.9	67.9	29.7
Unit Labor Cost (\$) <sup>b</sup>	0.220	0.221	0.224	0.07	0.04	0.09	74	49	58	165	175
	per litre	per litre	per litre	per litre	per litre	per litre	per ton	per ton	per ton	per \$ 000 sales	per \$ 000 sales

**Notes:** BL = Belgium, IT = Italy, NL = Netherlands, UK = United Kingdom, US = United States.

a Employment figures include production workers only.

b Figures are converted to US dollars using purchasing power parity.

**Table 3: Characteristics of Recruits, Mean Values, whole period**

	Ice-cream			Distillers			Food Processing			Pharma- ceuticals	
	IT <sup>a</sup>	UK	US <sup>b</sup>	IT	UK	US	NL	UK	US	BL	UK
Time period	85-97	75-96	80-97	75-95 <sup>a</sup>	75-94 <sup>a</sup>	75-92a	75-90	75-94	75-97	75-92	75-94
Average hires per year:											
Total	45	61	41	13	74	25	11	28	26	16	43
Permanent males	25	11	8	6	24	5	7	16	7	4	26
Starting age of new hires (years):											
Average	30.4	28.1	27.1	23.7	30.2	33.6	25.3	27.7	34.8	34.8	31.9
Standard deviation	5.2	10.0	7.9	5.1	10.0	9.1	5.9	9.1	9.8	7.1	11.2
Education of new hires (years):											
Average	10.6	11.9	12.1	9.8	11.4	12.1	10.8	11.2	12.4	10.9	11.0
Standard deviation	2.2	1.6	1.4	1.5	1.9	2.4	1.0	1.4	1.4	2.1	1.2

**Notes:** a Dates given are for the starting age series; 1975-1996 is the period for the education series for all Distillers plants.

**Table 4: Determinants of Demand for Education and Age Characteristics**

Variable (Mean)	Average Starting Age (30.1)		Standard Deviation of Starting Age (9.2)		Average Education (11.4)		Standard Deviation of Education (1.6)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Blanchard- Wolfers employment protection measure $t_{-1}$ (1.0)	-1.60 (-0.26)		-9.12*** (-2.94)		2.35*** (3.13)		-1.40 (-1.43)	
Daniel-Siebert employment protection measure $t_{-1}$ (1.3)		-0.50 (-0.14)		-3.73* (-1.75)		1.47** (2.08)		-0.10 (-1.57)
Union density $t_{-1}$ (38.6)	0.09 (0.46)	0.07 (0.44)	-0.21** (-1.96)	-0.13 (-1.29)	0.01 (0.28)	0.01 (0.16)	0.01 (0.28)	0.01 (0.32)
Tax wedge $t_{-1}$ (33.1)	0.18 (0.66)	0.06 (0.25)	-0.11 (-0.85)	-0.06 (-0.48)	0.11*** (2.80)	0.10** (2.24)	0.03 (0.65)	0.03 (0.63)
Employment deviation (0.6)	0.05 (0.64)	0.03 (0.41)	-0.12** (-2.24)	-0.12** (-2.29)	0.01 (0.61)	0.01 (0.78)	-0.01 (-0.96)	-0.02 (-1.13)
Unemploy - ment $t_{-1}$ (8.0)	-0.44** (-1.93)	-0.35* (-1.92)	-0.07 (-0.61)	-0.13 (-1.13)	-0.08** (-1.99)	-0.07** (-1.96)	0.00 (0.13)	0.00 (0.05)
MFG pay (1.5)	-6.26 (-1.42)	-7.96 (-1.58)	-2.45 (-1.00)	-4.27 (-1.35)	0.35 (0.44)	1.57 (1.43)	-0.76 (-0.98)	-1.57 (-1.61)
Age of the worker stock (42.0)	1.50*** (3.82)	-2.04* (-1.82)						
School leaving age $t_{-4}$ (15.8)					0.44*** (3.31)	0.30* (1.79)	0.04 (0.24)	0.13 (0.83)
Education (11.4)	-3.25** (-2.05)	-1.39*** (-3.56)						
Age (30.1)					-0.06 (-1.13)	-0.05*** (-2.88)		
Time trend	0.36 (1.50)	0.23 (1.51)	-0.34*** (-3.31)	-0.22** (-2.36)	0.08** (2.16)	0.06* (1.77)	0.02 (0.46)	0.02 (0.77)
Plant fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.48	0.56	0.54	0.52	0.59	0.59	0.36	0.37
Durbin-Wu Hausman test for endogeneity	Ed. exog - Prob > F = 0.20	Ed. exog. - Prob > F = 0.47	N/A		Age endog. - Prob > F = 0.01	Age exog. - Prob > F = 0.50	N/A	
Observations	148	148	153	153	148	148	147	147

**Notes:** Estimates are by ordinary least squares, apart from column (1) and (5), for which age and education have been estimated simultaneously, using three stage least squares. The sample is males on open-ended contracts, including those who became subsequently employed on an open-ended basis within a year. t-values are given in parentheses, and \*, \*\* and \*\*\* denote significance of the t-tests at the 10%, 5% and 1% levels.

**Table 5: Determinants of Labor Demand – Sensitivity Test Results****A Sample Comparisons**

		Sample	Average Starting Age	Standard Dev. of Starting Age	Average Education	Standard Dev. of Education
Blanchard-Wolfers employment protection measure	Employment protection coefficients [elasticities]	US + Europe	0	-9.12*** [-0.99]	3.03*** [0.27]	0
		Europe only	0	-9.56** [-1.84]	2.84** [0.41]	0
	Time coefficients:	US + Europe	0	-0.34***	0.08**	0
		Europe only	0	0	0	0
Daniel-Siebert employment protection measure	Employment protection coefficients [elasticities]	US + Europe	0	-3.73* [-0.53]	1.59** [0.18]	0
		Europe only	0	0	2.08* [0.28]	0
	Time coefficients:	US + Europe	0	-0.22**	0.06*	0
		Europe only	0	0	0	0

**Notes:** Elasticities calculated at the means are shown in square brackets. Plant fixed effects included in all equations. Other variables and estimation methods are the same as in Table 4.

**B Specification test: 5-year averages**

		Average Starting Age	Standard Dev. of Starting Age	Average Education	Standard Dev. of Education
Blanchard-Wolfers employment protection measure	Employment protection coefficients	0	-1.26*** [-0.21]	7.15** [-0.85]	1.44** [1.20]
	Time coefficients:	3.78**	0	1.46***	1.08***
Daniel-Siebert employment protection measure	Employment protection coefficients	0	-1.22*** [-0.20]	5.26*** [0.64]	0.95** [0.79]
	Time coefficients:	0	0	1.10**	0.82***

**Notes:** Elasticities calculated at the means are shown in square brackets Estimation is by unweighted OLS for all equations since variables are averaged over 5-year periods, which increases the number of observation underlying the dependent variables making weights unnecessary. To increase degrees of freedom, only significant fixed effects are retained.

**Table 6: The Link between Plant Tenure and the Employment Protection Indices**

Variable (Mean)	Average tenure (11.5)	
Blanchard-Wolfers employment protection measure $t_{-1}$ (1.3)	9.64 <sup>***</sup> (7.13)	
Daniel-Siebert employment protection measure $t_{-1}$ (1.4)		7.37 <sup>***</sup> (8.70)
Union density $t_{-1}$ (36.9)	0.04 (0.84)	-0.13 <sup>***</sup> (-2.91)
Tax wedge $t_{-1}$ (33.0)	-0.07 (-1.27)	0.08 (1.21)
Employment deviation $t_{-1}$ (-0.0)	-0.09 <sup>***</sup> (-2.63)	-0.07 <sup>**</sup> (-2.31)
Unemployment $t_{-1}$ (8.4)	0.04 (0.66)	0.09 (1.51)
Time trend	0.42 <sup>***</sup> (7.68)	0.23 <sup>***</sup> (5.29)
Plant fixed effects	Yes	Yes
R <sup>2</sup>	0.85	0.86
Observations	164	164

**Notes:** t-values are given in parentheses. \*, \*\* and \*\*\* denote significance of the t-tests at the 10%, 5% and 1% levels.

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## Appendix 1: Comparative statics results

Differentiating equations (6) and (7) totally we derive:

$$(pg_{AA} - w_{AA} - \beta V \theta_{AA})dA + (pg_{AE} - w_{AE} - \beta V \theta_{AE})dE = \beta \theta_A dV$$

$$(pg_{EA} - w_{EA} - \beta V \theta_{EA})dA + (pg_{EE} - w_{EE} - \beta V \theta_{EE})dE = \beta \theta_E dV$$

Solving for  $dA/dV$  using Cramer's rule gives:

$$\frac{dA}{dV} = \frac{\begin{vmatrix} \beta \theta_A & pg_{AE} - w_{AE} - \beta V \theta_{AE} \\ \beta \theta_E & pg_{EE} - w_{EE} - \beta V \theta_{EE} \end{vmatrix}}{\begin{vmatrix} pg_{AA} - w_{AA} - \beta V \theta_{AA} & pg_{AE} - w_{AE} - \beta V \theta_{AE} \\ pg_{EA} - w_{EA} - \beta V \theta_{EA} & pg_{EE} - w_{EE} - \beta V \theta_{EE} \end{vmatrix}}$$

Second order conditions require the determinant of the denominator,  $\Delta$ , to be positive for a maximum. On the education side, we require  $w_E > 0$  and  $w_{EE} > 0$  (wages increase at an increasing rate as shown in Figure 2). We have no priors about  $\theta_{EE}$ , and so assume  $\theta_{EE} = 0$ . We also assume  $g_E > 0$  and  $g_{EE} < 0$  (diminishing returns to education). On the starting age side we assume  $g_A > 0$ ,  $g_{AA} < 0$  (an inverted U for worker efficiency by age as shown in Figure 1),  $\theta_A > \text{or} < 0$ , and  $\theta_{AA} > 0$  (failure probability is U-shaped with age, though the reaction could be near-zero for workers in the prime age group). We have no priors regarding  $w_A$  and  $w_{AA}$ , and so assume  $w_A = w_{AA} = 0$ . Finally, we assume all cross-products zero, except for  $g_{AE} > 0$ .

We then see that  $dA/dV$  is  $>$  or  $<$  0 since:

$$\frac{dA}{dV} = \frac{\begin{vmatrix} \beta \theta_A & pg_{AE} \\ \beta \theta_E & pg_{EE} - w_{EE} \end{vmatrix}}{\begin{vmatrix} pg_{AA} - \beta V \theta_{AA} & pg_{AE} \\ pg_{EA} & pg_{EE} - w_{EE} \end{vmatrix}}$$

$= ((pg_{EE} - w_{EE}) \beta \theta_A - \beta \theta_E pg_{AE})/\Delta$  which is  $>$  or  $<$  0 since the first term is positive or negative, depending on  $\theta_A$ , and the second is negative.

However,  $dE/dV$  is likely to be  $>$  0, since by a similar procedure we find:

$$\frac{dE}{dV} = \frac{\begin{vmatrix} pg_{AA} - \beta V \theta_{AA} & \beta \theta_A \\ pg_{EA} & \beta \theta_E \end{vmatrix}}{\begin{vmatrix} pg_{AA} - \beta V \theta_{AA} & pg_{AE} \\ pg_{EA} & pg_{EE} - w_{EE} \end{vmatrix}}$$

$= ((pg_{AA} - \beta V \theta_{AA}) \beta \theta_E - \beta \theta_A pg_{AE})/\Delta$ . Here the second term depends on  $\theta_A$ , and so again can be positive or negative. However, the first term is positive, and grows larger with  $V$ . Where  $V$  is sizeable, therefore, we can be confident that  $dE/dV > 0$ .

## Appendix 2: Reduced Form Equations for Average Age and Education

Variable (Mean)	Average Starting Age (30.1)		Average Education (11.4)	
	(1)	(2)	(3)	(4)
Blanchard- Wolfers employment protection measure $t_{-1}$ (1.0)	-8.87* (-1.67)		3.03*** (2.74)	
Daniel-Siebert employment protection measure $t_{-1}$ (1.3)		-2.73 (-0.076)		1.59** (2.18)
Union density $t_{-1}$ (38.6)	-0.09 (0.45)	-0.00 (-0.01)	0.01 (0.16)	-0.00 (-0.03)
Tax wedge $t_{-1}$ (33.1)	-0.42* (-1.88)	-0.35 (-1.52)	0.12** (2.48)	0.11** (2.23)
Employment deviation (0.6)	-0.01 (-0.07)	-0.01 (-0.09)	0.01 (0.46)	0.01 (0.69)
Unemploy - ment $t_{-1}$ (8.0)	-0.07 (-0.343)	-0.14 (-0.72)	-0.07* (-1.86)	-0.06 (-1.52)
MFG pay (1.5)	-11.08*** (-2.68)	-11.99** (-2.24)	0.84 (0.96)	2.05* (1.84)
School leaving age $t_{-4}$ (15.8)			0.55*** (2.97)	0.36** (2.08)
Time trend	-0.06 (-0.34)	0.05 (0.33)	0.07* (1.95)	0.05 (1.41)
Plant <sup>fixed</sup> effects	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.49	0.48	0.57	0.56
Observations	155	155	148	148

Notes: Estimation by weighted OLS.

# Does Strict Employment Protection Legislation Deter FDI?

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### **Abstract**

While popular sentiment suggests that strict employment protection legislation will tend to weaken the attractiveness of a country as a location for FDI, theoretical predictions on this issue are mixed. In this study, we report empirical evidence on this issue, using panel data for a sample of OECD countries. Overall, our findings support the view that increases in the strictness of regulations governing employment contracts may have a deterrent effect on FDI. However, we find evidence for a non-linear effect, such that very high levels of employment protection may actually help to make an economy a more attractive location for FDI.

JEL codes: F21, J58

## 1. Introduction

What are the factors that help to make a country a more – or less – attractive location for foreign direct investment (FDI)? The substantial increase in global flows of FDI that has occurred in recent years has prompted a renewed interest in this question both from academics and policy-makers. In response, a vast literature, featuring both theoretical and empirical contributions, has emerged; the main findings of which, are surveyed admirably in a recent book by Moosa (2002).

A view that seems to have gained popularity amongst policy-makers - in Anglo-Saxon economies, at least - is that greater labour market flexibility helps to make a country a more attractive location for FDI.<sup>1</sup> A corollary of this is that a strict regime of employment protection legislation, which is often held to inhibit labour market flexibility, will tend to diminish a country's attractiveness as a location for FDI. Recent theoretical analysis has lent some support to this view. In two recent theoretical contributions, Haaland and Wooton (2001, 2002) observe that in an environment of uncertainty multinational enterprises will want to take account of future exit costs when deciding on the location of a new investment. Employment protection legislation – e.g. in the form of statutory redundancy payments – will tend to add to the scale of future exit costs. Countries with relatively strict employment protection legislation will therefore tend to be less attractive locations for FDI, other things equal, than countries with relatively weak employment protection regimes.

Theoretical analysis does not present unambiguous predictions concerning the effect of employment protection legislation, however. Dewit et al (2003) show that if firms act strategically there may be circumstances in which it would be advantageous to locate in a country with a strict employment protection regime. The explanation is

that strict employment protection raises the costs of adjustment for firms that change the scale of their production. Therefore, if a firm wishes to commit to maintaining a particular output level it may be in its interests to locate in a country with a strict employment protection regime.

To date, there appears to have been only one empirical study that has attempted to address the issue of the influence of employment protection legislation on FDI. The study by Cooke (1997) presents a cross-section econometric analysis of the determinants of the location decisions by U.S. multinational enterprises in a number of industries. Based on a classification of the strictness of the employment protection regime in different countries due to Emerson (1988), Cooke finds that, other things equal, investment by U.S. multinationals is significantly lower in the six countries (France, Greece, Italy, the Netherlands, Portugal, and Spain) that have the tightest restrictions on the ability of firms to lay off redundant workers.

Cooke's study is limited in that he focuses on the investment decisions of multinational companies of a single country (albeit that U.S. firms are important contributors to global flows of FDI), using data for a single point in time (the early 1990s), and in that the dummy variable he uses represents a relatively crude measure of the effects of employment protection. In the light of these limitations, there is scope for a more extensive examination of the relationship between the strictness of employment protection legislation and the direction of international flows of FDI.

The present paper aims to test the hypothesis that strict employment protection legislation helps to deter FDI. The study therefore contributes to the growing literature that examines the effect of employment protection legislation (EPL) on economic performance. Most of the existing literature has focused on the labour

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<sup>1</sup> This view has been expressed by the United Kingdom government, for example. See HM

market effects of EPL. In particular, studies have examined the impact of EPL on the rate and structure of unemployment (see for example: Bertola, 1990; Gregg and Manning, 1997; and Nickell, 1997), the pattern of worker and job flows (Schettkat, 1997; Boeri, 1999), and the structure of employment (OECD, 1999; Bertola et al, 2002; Robson, 2003). On the whole, the evidence from these studies is rather mixed. While stricter EPL appears to influence both the duration and demographic composition of employment and unemployment, there is little evidence to suggest that it has a significant impact on either the average rate of unemployment or the employment-population ratio. In spite of this rather mixed evidence on the effects of EPL, the view appears to have taken hold in policy-making circles that strict employment protection legislation is detrimental to economic performance, and is a significant factor in explaining the recent sluggish performance of many European economies relative to that of the United States (see for example OECD, 1994).

In order to examine the effects of employment protection legislation on FDI we make use of an indicator of the strictness of EPL constructed by Blanchard and Wolfers (2000). This indicator, which is developed from previous work carried out by the OECD (OECD, 1999) and Lazear (1990), covers a number of OECD countries and is available for a sequence of five -year periods from 1960-4 through to the mid-1990s. We make use of a subset of the data, corresponding to the figures that we have available for FDI. We estimate panel data regressions of aggregate inflows of FDI on employment protection and a set of additional explanatory variables that have been found in previous studies to have a significant effect on FDI flows.

Overall, our results are supportive of the notion that strict employment protection legislation may help to reduce the attractiveness of a country as a location

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Government (1996).

for FDI. In particular, our results suggest that FDI is particularly attracted to countries with very weak EPL. At higher levels of EPL, however, the effect of further restrictions on hiring and firing becomes relatively weak and may indeed become positive.

The outline of the remainder of the paper is as follows. In section 2, we discuss the data and the specification of our basic empirical model. Section 3 reports the results, while section 4 provides concluding comments.

## 2. Data and Empirical Specification

The measure of the strictness of employment protection legislation we use for this study is the indicator constructed by Blanchard and Wolfers (2000) for their investigation of the role of shocks and institutions in the determination of OECD unemployment. The Blanchard and Wolfers measure is a summary indicator of the overall strictness of EPL that builds on previous work carried out by the OECD (OECD, 1999) and Lazear (1990). The indicator is scaled to lie between a minimum value of 0 (corresponding to very weak employment protection) and a maximum of 6 (corresponding to very strict protection). The data is available for a number of OECD countries, in the form of five-year average values over the period from 1960 through to the mid-1990s, though in this study we use data only from 1965-9 onwards, corresponding to the availability of data on FDI flows.<sup>2</sup>

The Blanchard-Wolfers measure embraces a wide range of restrictions on the use of labour, including regulations governing the use of fixed term contracts and the activities of temporary work agencies. In contrast, the model put forward by Haaland and Wooton (2001, 2002) suggests that the influence of employment protection on FDI is likely to come through its effect on the scale of exit costs. These are most likely to be related to regulations relating to the cost of dismissals, in particular collective dismissals - for example, regulations governing the size of severance payments and periods of advanced notice of dismissal. These are the focus of the measures constructed by Lazear (1990) (which are used by Blanchard and Wolfers in the construction of their indicator). However, the Lazear measures are only available up to 1984, which limits their usefulness for an analysis of the determinants of FDI. Of the several measures of the strictness of EPL that have appeared in the literature,

the Blanchard-Wolfers indicator offers the most extensive coverage and despite its limitations is therefore the one that we use in our analysis.<sup>3</sup>

Table 1 shows selected values of the Blanchard-Wolfers indicator of the strictness of EPL for the countries in our data sample. The data indicate that the overall strictness of EPL tends to be highest in the southern European countries – Greece, Italy and Spain – and weakest in the USA, Canada and the United Kingdom. A number of countries – Belgium, Denmark and Sweden among them – appear to have introduced measures to relax the strictness of EPL in their economies during the 1990s. The main exception to this trend was in France, where the 1990s saw further tightening of the employment protection regime through the imposition of tighter restrictions on the maximum cumulative duration of fixed term contracts and tighter limits on the scope of the activities of temporary work agencies.<sup>4</sup>

We have two sets of data on FDI; one measured at the aggregate level, the other disaggregated by sector. At the aggregate level, we use the data on inflows of FDI published in the IMF *International Financial Statistics Yearbook*. The data, which are expressed in national currencies, are converted into U.S. dollars using current exchange rates and deflated by the U.S. GDP deflator. The sectoral data is taken from the OECD's *International Direct Investment Statistics Yearbook* (OECD, 1999b). The sectors for which data is available are listed in the Data Appendix.

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<sup>2</sup> Note that the final observation for each country included in the data series is a three-year average for the period 1995-7. See the Appendix to Blanchard and Wolfers (2000) for details of the construction of the data series. The Appendix is available at <http://econ-www.mit.edu/faculty/blanchar/papers.htm> .

<sup>3</sup> Other studies that have attempted to construct comparative measures of the strictness of EPL across different countries include Emerson (1988), Bertola (1990), Grubb and Wells (1993) and OECD (1999a).

<sup>4</sup> Further discussion of recent developments in employment protection legislation in OECD countries is contained in OECD (1999a).

Figure 1 provides a cross-plot of observations on the natural log of real aggregate FDI flows and the Blanchard-Wolfers indicator of the strictness of EPL.<sup>5</sup> The cross-plot provides preliminary evidence in support of a negative relationship between the two series, although the relationship is subject to significant dispersion. Closer inspection suggests the possibility that there may be non-linearities in the relationship between EPL and FDI. In particular, the relationship appears to exhibit something of an s-shaped pattern, such that there appears to be a relatively strong effect of EPL on FDI for countries with either very weak or very strong employment protection but a relatively weak effect for countries in between in these extremes.<sup>6</sup> We investigate this issue more fully in our more formal empirical analysis below.

In order to test the hypothesis of a negative relationship between the strictness of employment protection legislation and inflows of FDI more thoroughly, we need to control for the presence of other potential influences on FDI. We therefore include as additional explanatory variables in our regressions a list of variables that have been found in other studies to have a significant effect on the attractiveness of a country as a location for FDI. These are: the level and growth of real GDP, the productivity adjusted real wage, openness to trade, the real exchange rate (more specifically, we include a measure of real exchange rate depreciation), corporate taxes as a percentage of GDP, and the host country unemployment rate. The level of real GDP is included as a measure of the market size of the host country and is expected to have a positive effect on inflows of FDI (see Moore, 1993; Bajo-Rubio and Sosvilla-Rivero, 1994; Wang and Swain, 1995; Billington, 1999; and Cleeve and Ndhlovu, 2001, amongst others, for evidence in support of this), as is the rate of growth of real GDP. The

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<sup>5</sup> Note that this cross-plot includes observations for a number of countries – Iceland, Korea, Luxembourg, Mexico, Portugal and Turkey – that are excluded from the sample used in our regression analysis as we do not have complete data for these countries on the full set of explanatory variables used in our analysis.

evidence on the effects of the other variables is mixed, with some studies finding positive effects; others negative effects; and others still, no significant effect.<sup>7</sup>

The variables listed above, plus a time trend to capture the general increase in FDI flows over time, form the set of control variables we use in our regression analysis to investigate the issue of whether strict employment protection legislation serves to deter FDI.

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<sup>6</sup> We are grateful to Jonathan Wildman for this observation.

<sup>7</sup> Recent studies on the effects of real wage costs include Moore (1993), Pain (1993), Bajo-Rubio and Sosvilla-Rivero (1994), Wang and Swain (1995), Love and Lage-Hidalgo (2000), Billington (1999) and Wheeler and Mody (1992). Evidence on the effects of trade openness may be found in Kravis and Lipsey (1982), Edwards (1990) and Yang et al (2000). For evidence on exchange rate effects see Caves (1988), Froot and Stein (1991), Blonigen (1997), Görg and Wakelin (2001) and Yang et al (2000). Grubert and Mutti (1991), Wheeler and Mody (1992), Hines and Rice (1994), Swenson (1994), Jackson and Markowski (1995), Loree and Guisinger (1995), Mudambi (1995), Porcano and Price (1996), Cassou (1997), Kemsley (1998), Billington (1999) are among a host of studies that have examined the effect of corporate tax rates on multinational enterprise location decisions. Finally, the effects of the host country unemployment rate in the have been studied by Billington (1999) and Cassou (1997).

### 3. Empirical Analysis

Table 2 reports the results of our initial panel data regression analysis. Three sets of results are shown. Columns (1) and (2) show the results from regressions using data on aggregate FDI flows. For these regressions, we have an unbalanced panel of 108 observations as data on FDI and/or one or more explanatory variables are missing for some time periods. The countries for which data are used are listed in the Data Appendix.

The estimates in column (1) are obtained using Feasible GLS estimation, with allowance for heteroskedasticity and autocorrelation in the equation disturbances<sup>8</sup>. They show a strong negative effect of EPL on inflows of foreign direct investment, with significant effects also for the level and growth of real GDP, real exchange rate depreciation, and the host country unemployment rate. Insignificant effects are found for the corporate tax burden, openness and the productivity-adjusted real wage.

The positive sign for the coefficient of the log of real GDP supports the common finding that market size is an important influence on the attractiveness of a country as a location for FDI, while the positive coefficient for real GDP growth suggests that FDI is attracted to growing markets. The positive sign for the coefficient on the host country unemployment rate suggests that the availability of labour may be an important factor in the location decisions of multinational enterprises. Alternatively, it may be the case that the governments of countries with relatively high rates of unemployment are willing to offer higher subsidies in order to attract multinational enterprise investment. Finally, the negative coefficient for the depreciation of the real exchange rate is consistent with the notion that FDI may be a substitute for trade. In addition, it is possible that the currency depreciation variable

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<sup>8</sup> All results are obtained using version 7.0 of Stata.

may be picking up the effects of exchange rate volatility on the incentives for FDI (Campa, 1993).

The second column of Table 2 shows the results from a random effects specification that allows for the presence of unobserved country-specific effects on FDI inflows. These unobserved effects include the effects of persistent characteristics, such as geographical proximity to markets, language spoken, etc., that may make countries more or less attractive locations for FDI. The results show that although rather weaker, the negative effect of EPL remains statistically significant at the 10% level (5% on a one-tailed test).<sup>9</sup>

In column (3), we report the results of estimating our equation using sectorally disaggregated data on FDI flows<sup>10</sup>. The regression equation includes sectoral dummies and the coefficient standard errors are adjusted to allow for the ‘clustering’ of observations due to the fact that the explanatory variables are measured at the aggregate level (Moulton, 1986). The magnitude of the coefficient for EPL is much smaller than in the equations estimated using aggregate data, but once again it is statistically well determined.<sup>11</sup> Overall then, the evidence we have presented so far provides support for the notion that a strict regime of employment protection legislation may serve to deter FDI.

#### *Are There Non-linearities in the Relationship Between EPL and FDI?*

In Section 2, we raised the possibility, based on an examination of the data in Figure 1, that there may be non-linearities in the relationship between EPL and FDI.

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<sup>9</sup> We have also estimated fixed effects specifications. In these, the effect of employment protection legislation remains reasonably strong, particularly when the equation is estimated by Feasible GLS. However, the results of a Hausman specification test show that the results of the Random effects specification are narrowly preferred (the significance level for the test of the null hypothesis of random effects is 0.085). Moreover, it is worth noting that some of our explanatory variables exhibit relatively little time series variation. In such circumstances, fixed effects methods can lead to imprecise estimates and random effects estimation may therefore be preferable (Wooldridge, 2002).

To investigate this, we experimented with estimating a variety of non-linear functional forms, including quadratic, cubic and piecewise linear specifications. Of these, the quadratic specification appears to work best, both in terms of goodness of fit and in terms of providing a model with intuitively interpretable coefficients. The results are reported in Table 3.

The quadratic term in the employment protection index is insignificant in the random effects specification but strongly significant in the equation estimated by Feasible GLS and in the equation estimated using sectorally disaggregated data. The coefficient estimates suggest that starting from a position of very weak employment protection legislation there is a strong deterrent effect on inward FDI as the strictness of employment protection legislation is increased. However, this deterrent effect tails off quite rapidly and in fact seems to disappear at intermediate levels of employment protection, corresponding to a value of the employment protection index of just below three. Beyond this, the effect of stricter employment protection legislation appears, if anything, to be positive.

The apparent non-linearity in the relationship between employment protection legislation and inward FDI suggests that for multinational enterprises seeking mobile investment opportunities employment protection legislation may be perceived as imposing a potential fixed cost on their operations, which they are keen to avoid. FDI is therefore particularly attracted to countries with very weak employment protection legislation. This is supported by the results of an alternative specification in which we include a dummy variable for countries with values of the employment protection index below 1.5 (results available from the authors on request). Alternatively, the finding of a quadratic relationship could be consistent with the work of Dewit et al

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<sup>10</sup> Details of the sectors included are given in the Data appendix.

(2003), who show that while in general increases in the strictness of employment protection legislation may be expected to have a deterrent effect on inward FDI, strategic motives may in some circumstances lead firms to locate in countries with relatively strict regimes of employment protection legislation.

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<sup>11</sup> The coefficient for the log of real GDP is likewise reduced in magnitude.

## 4. Conclusions

In this study, we have set out to examine the hypothesis that a strict employment protection regime reduces the attractiveness of a country as a location for FDI. This view, which seems to have gained popularity with policy makers and other commentators, has received theoretical support in two recent papers by Haaland and Wooton (2001, 2002). Further work by Dewit et al (2003), however, shows that if firms act strategically there may be some circumstances in which firms may find it in their best interests to locate in countries with relatively strict employment protection.

In examining the relationship between the strictness of employment protection and FDI, we have made use of a summary indicator of the strictness of employment protection legislation in a number of OECD countries, constructed by Blanchard and Wolfers (2000). We have estimated panel data regressions using five-year average values of aggregate and sectorally disaggregated data for the period from the 1970s through to the mid-1990s. The results from this analysis are largely supportive of the hypothesis that a strict regime of employment protection serves to deter inward investment by multinational enterprises. They may therefore be seen as reinforcing and supplementing the earlier empirical findings of Cooke (1997).

The effect of employment protection legislation is found to be quantitatively as well as statistically significant. There is some variation in the estimated effect of EPL depending on the data used and the specification chosen. However, using the semi-log specification in Table 2, our most conservative estimate (from column (3)) suggests that other things equal a one unit decrease in the value of the indicator of the strictness of EPL (equivalent, for example, to the difference in the value of the indicator between Italy and the Netherlands in 1995-7) is associated with an increase

in the real value of inflows of FDI of six percent; comparable to the effect of a one percent increase in the log of real GDP.

These results may therefore be seen as lending support to the position of those governments and commentators who have advocated the merits of flexible labour markets as a means of attracting internationally mobile FDI. However, the evidence we have found for a quadratic relationship between employment protection and FDI suggests that matters may not be this straightforward. The latter suggests that while countries with relatively few restrictions on hiring and firing may gain benefits in terms of attracting inflows of FDI from a further relaxation of legislation in this area, countries with relatively strict regimes of employment protection may gain from a further tightening of regulations. Such a policy prescription runs counter to much previous thinking on this issue and while it may in principle be defended on theoretical grounds as well as being supported by the empirical evidence, we would not necessarily want to press this claim too strenuously. The quadratic specification on which it is based should perhaps be seen as an approximation to a more complex non-linear relationship. Where we are confident, however, is in stating the finding that the deterrent effect of stricter employment protection legislation on FDI becomes weaker as the severity of restrictions on hiring and firing is increased.

All in all, our results are consistent with the notion that strict employment protection legislation may - up to a point at least - reduce the attractiveness of a country to FDI. As such, they support the proposition that a relaxation of the strictness of employment protection regulations may be a potentially powerful policy instrument for governments seeking to make their economies more attractive locations for multinational enterprise investment. However, insofar as the result may be believed, the finding that a very strict employment protection regime may actually help to make

an economy a more attractive location for FDI may serve to allay fears that competition between governments keen to attract internationally mobile investment may lead them into a 'race to the bottom' in labour standards relating to employment protection.

**Table 1. Selected Values of the Blanchard-Wolfers Index of the Strictness of Employment Protection Legislation**

<i>Country</i>	<i>1965-9</i>	<i>1985-9</i>	<i>1995-7</i>
Australia	1	1	1
Belgium	2.21	3.1	2.2
Canada	0.6	0.6	0.6
Denmark	1.8	2.2	1.3
Finland	2.4	2.4	2.1
France	1.02	2.6	3.1
Germany	1.44	3.3	2.7
Greece	3.7	3.7	3.7
Ireland	0.25	1	1.1
Italy	4	4	3.4
Japan	2.8	2.8	2.8
Netherlands	2.7	2.7	2.4
New Zealand	1.6	1.6	1.6
Norway	3.1	3.1	2.7
Spain	4	3.8	3.1
Sweden	0	3.6	2.4
Switzerland	1.1	1.1	1.1
United Kingdom	0.33	0.7	0.7
USA	0.2	0.2	0.2

Source: Appendix to Blanchard and Wolfers (2000), available at <http://web.mit.edu/blanchar/www/articles.html>

**Table 2. Determinants of FDI Inflows**

The Dependent variable is the log of real inflows of FDI in U.S. dollars.

Estimation Method	(1) Feasible GLS	(2) Random Effects GLS	(3) OLS
log [real GDP]	0.6788*** (0.0961)	0.4295** (0.1815)	0.0627*** (0.0171)
Real GDP growth	0.1859*** (0.0333)	0.1408*** (0.0508)	0.0111 (0.0175)
Employment protection	-0.3501*** (0.084)	-0.2556* (0.1501)	-0.0613*** (0.0153)
log [productivity- adjusted real wage]	-0.0140 (0.0820)	0.2132 (0.1573)	-0.0076 (0.0120)
Unemployment rate	6.3257*** (2.2875)	3.7681 (3.2682)	0.0273 (0.3896)
Real exchange rate depreciation	-0.0073** (0.0029)	-0.0205** (0.0222)	0.0029 (0.0037)
Openness	0.0072 (0.0046)	-0.0016 (0.0077)	0.0003 (0.0010)
Corporate taxes/GDP	-0.0431 (0.0561)	-0.0557 (0.0990)	-0.0306 (0.0701)
Trend	0.1982*** (0.0595)	0.3773*** (0.0852)	0.0315** (0.0125)
Constant	-2.2128 (1.2590)	-1.8074 (2.3751)	7.7672*** (0.2376)
Number of observations	108	108	455
R <sup>2</sup>		0.5276	0.4717
Log likelihood	-82.3319		

Coefficient standard errors in parentheses. In column (3) the standard errors are robust to the effects of clustering of the observations by country.

\*, \*\*, \*\*\* denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

Sectoral dummies are included in the equation reported in column (3).

See the Data Appendix for a list of the countries (and sectors) included in the estimation sample.

**Table 3. Testing for Non-linear Effects of EPL**

The Dependent variable is the log of real inflows of FDI in U.S. dollars

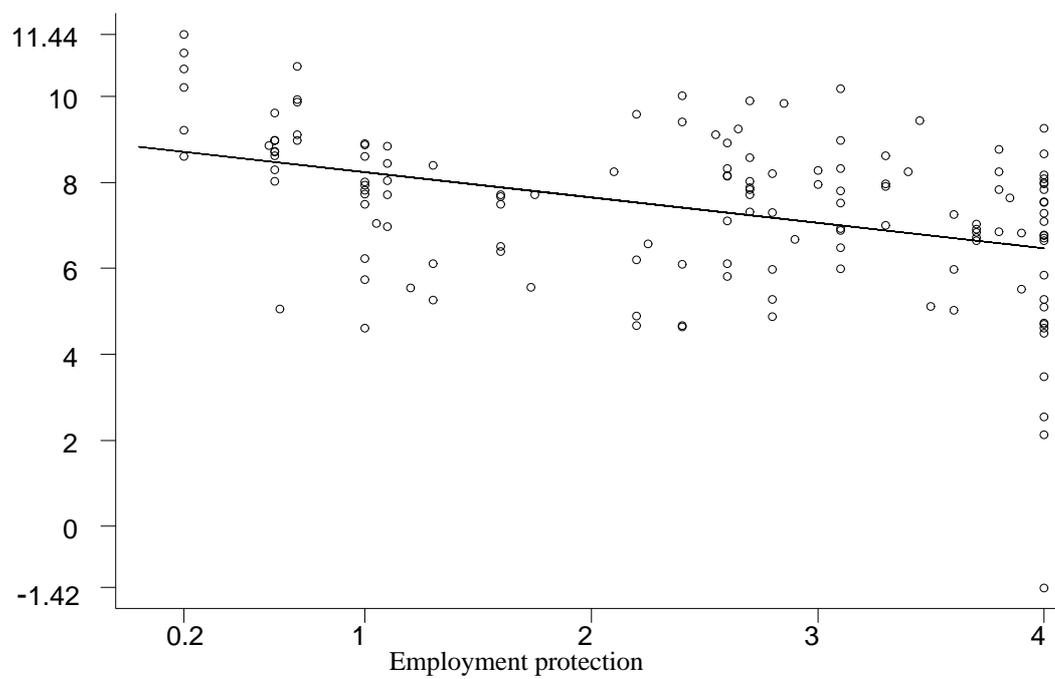
Estimation Method	(1) Feasible GLS	(2) Random Effects GLS	(3) OLS
log [real GDP]	0.5395*** (0.1107)	0.3983** (0.1828)	0.0471*** (0.0152)
Real GDP growth	0.1788*** (0.0326)	0.1367*** (0.0506)	0.0104 (0.0154)
Employment protection	-1.4598*** (0.4603)	-1.1820* (0.6983)	-0.2128*** (0.0120)
EPL squared	0.2496** (0.1032)	0.2063 (0.1518)	0.0386*** (0.0120)
log [productivity- adjusted real wage]	0.0349 (0.0808)	0.2265 (0.1574)	0.0040 (0.0087)
Unemployment rate	6.6337*** (2.2123)	4.0089 (3.2625)	-0.1038 (0.3005)
Real exchange rate depreciation	-0.03909*** (0.0142)	-0.0254 (0.0223)	0.0040 (0.0041)
Openness	0.0101** (0.0050)	0.0011 (0.0079)	0.0007 (0.0009)
Corporate taxes/GDP	-0.0318 (0.0575)	-0.0324 (1.0000)	-0.0265 (0.0157)
Trend	0.2408*** (0.0649)	0.3926*** (0.0855)	0.0413*** (0.0118)
Constant	-0.5506 (1.3703)	-1.0841 (2.4309)	7.9145*** (0.2208)
Number of observations	108	108	455
R <sup>2</sup>		0.5693	0.4923
Log likelihood	-79.42879		

Coefficient standard errors in parentheses. In column (3) the standard errors are robust to the effects of clustering of the observations by country.

\*, \*\*, \*\*\* denote statistical significance at the 10%, 5% and 1% significance levels, respectively.

Sectoral dummies are included in the equations reported in column (3).

See the Data Appendix for a list of the countries (and sectors) included in the estimation sample.

**Figure 1. FDI Flows and the Strictness of Employment Protection Legislation**

## Data Appendix

The countries included in the data sample used for the panel data regressions are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, New Zealand, Spain, Sweden, Switzerland, the UK, and the USA. Figure 1 features in addition data from Iceland, Korea, Luxembourg, Mexico, Portugal, and Turkey. These countries are excluded from the data sample used for the panel estimations because data for corporate taxes and/or wages are missing.

### FDI Inflows

For the aggregate data analysis, figures for inflows of foreign direct investment in national currencies dollars are compiled from the *International Financial Statistics Yearbook* of the IMF. These are converted into U.S. dollars using current exchange rates and then deflated using the U.S. GDP deflator.

For the sectoral analysis, we have data for the following sectors: mining and quarrying; agriculture and fishing; food production; textiles and wood production; petroleum, chemicals, rubber and plastic; metallic and mechanical products; machinery, RTV, computers and communications; vehicles and transport equipment; construction; trade and repairs; hotels and restaurants; land, sea and air transport; and financial intermediation. The data are taken from the OECD's *International Direct Investment Statistics Yearbook*.

### Employment Protection

As stated in the text, we use the summary indicator of the strictness of employment protection legislation compiled by Blanchard and Wolfers (2000). Details of the methods used to construct values of the indicator may be found in the Appendix to Blanchard and Wolfers' paper, located at <http://econ-www.mit.edu/faculty/blanchar/papers.htm>

### Real GDP and Real GDP Growth

Nominal GDP figures in national currencies are obtained from the *International Financial Statistics Yearbook*. These are converted to U.S. dollars using current exchange rates. Real values are then obtained by dividing by the U.S. GDP price deflator. The growth series is calculated as the percentage change from the previous year's real GDP figure.

### Productivity-adjusted Real Wage

The figures are obtained from the data set used by Blanchard and Wolfers (2000). See the Appendix to their paper for details of the method used to calculate the figures.

### Unemployment Rate

Standardised unemployment rates are obtained from the Blanchard-Wolfers database.

### Real Depreciation

The percentage change in the real exchange rate from the previous year (a positive value means a depreciation). Real exchange rates are calculated by multiplying the nominal exchange rate by the ratio of the U.S. GDP deflator to the GDP deflator of

the home country. The source for all series is the *International Financial Statistics Yearbook*.

Openness

This is defined as the sum of exports plus imports as a percentage of GDP. The component series are obtained from the *International Financial Statistics Yearbook*.

Corporate Taxes/GDP

Income from corporate taxes as a percentage of GDP. The data are published in various editions of *Revenue Statistics of OECD Countries*. We are grateful to John Ashworth for supplying us with the data.

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Globalisation and Labour Markets



Research Paper 2009/21

*Does the impact of employment protection legislation on FDI differ by skill-intensity of sectors? An empirical investigation*

By

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# **Does the impact of employment protection legislation on FDI differ by skill-intensity of sectors? An empirical investigation**

by

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## **Abstract**

In line with previous literature this paper finds that strict employment protection legislation has a negative impact on the volume of inward Foreign Direct Investment. Rigid labor markets result in high adjustment and exit costs which deter foreign investments. We also find that the deterrent effect of inflexible labor markets is larger for industries with relatively high shares of low-skilled workers employed. Our findings are consistent with the view that governments can support structural change by tightening labor market regulations which especially deters inflows of FDI into low-skill industries. To avoid a drop in high-skill FDI host countries should simultaneously improve other location factors especially relevant for the latter.

**JEL classification:** J41, J8, F23

**Keywords:** Foreign Direct Investment; Labour Market; OECD; Panel Econometrics

## **Outline**

1. *Introduction*
2. *Review of related empirical literature*
3. *Empirical model and methodology, variables and data issues*
4. *Results*
5. *Conclusions*

## Non-Technical Summary

A flexible labor market with low levels of employment protection is commonly perceived to provide an environment conducive to investment, employment and structural change. Many countries have therefore increased the flexibility of their labour markets during the past decades. An important element in the flexibilization of the labor markets is the degree of employment protection legislation. Employment protection encompasses regulations, either legislated or written in labor contracts that limit the employer's ability to hire or fire workers without delay or cost

Frequently, a positive relationship between labor market flexibility, a low degree of employment protection legislation, and Foreign Direct Investment (FDI) attraction has been proposed. This positive relationship is based on the view that strict employment protection legislation imposes exit costs for firms which - *ceteris paribus* - hamper inward FDI due to a reduction of an investment's profitability.

It is conceivable that higher exit costs due to strict employment protection legislation might be of particular relevance for FDI in industries which are highly mobile and less committed to a particular host location. Such industries, often termed "footloose industries", are especially sensitive to changing comparative advantage or changes in production cost. High exit costs prevent these industries from adjusting to such changes. These industries continuously seek for low labor cost locations and employ a rather large share of low skilled workers. Thus, it is likely that the negative impact of strict employment protection regulations on FDI *inter alia* depends on an industry's skill intensity.

The current study investigates the relationship between employment protection legislation and FDI in a panel of major host countries for inward FDI at the industry level. We add to the existing literature by testing the conditional hypothesis that the impact of strict employment protection legislation on FDI differs across industries due to differences in the skill composition of the workforce. Our prior expectation is that tight employment protection legislation will affect FDI more negatively in mobile industries with a higher share of low-skilled employment due to the greater importance of exit costs.

The sample used in this panel econometric study includes ten manufacturing sectors in 11 host countries for FDI for the period 1995-2005 and controls for a large number of determinants of FDI. In line with previous literature this paper finds that employment protection legislation, especially regulations towards regular employment, has a negative impact on the volume of inward Foreign Direct Investment. Yet, we also find that the deterrent effect of inflexible labor markets is predominately given for industries with relatively high shares of low skilled workers employed. This result is consistent with the view that high exit costs due to strict employment protection legislation matters particularly for mobile industries like the textile, food and wood industries which continuously seek for low labor cost locations.

## I. INTRODUCTION

Jurisdictions try to attract Foreign Direct Investment (FDI) by offering favorable location factors distinguishing them from competitor countries. A vast empirical literature exploring the determinants of FDI has emerged (e.g. Fontagné and Mayer 2005 for an overview). The results generally imply that both, market- and cost-factors matter for FDI attraction. Within the group of cost-factors labor-related costs are important. Costs of this type not only comprise directly measurable factors like wage costs (i.e. compensation to employees and social security contributions) but also more indirect costs stemming from the inflexibility of labor markets. Inflexibility of the labor markets creates costs for Multinational Enterprises (MNEs), since it might prevent profit maximizing adjustment of the labor force in the short-run.

Yet, although most FDI studies take wage costs into account, empirical studies exploring the relationship between labor market inflexibility and FDI have emerged only recently (see section 2 for an overview). This empirical literature is in favor of a negative effect of inflexible labor markets on FDI decisions of MNEs. Put differently, a positive relationship between labor market flexibility and FDI attraction is frequently proposed. This positive relationship is based on the view that rigid labor markets impose adjustment and exit cost which - *ceteris paribus* - hamper inward FDI due to a reduction in an investment's profitability (see Haaland et al. 2003; Nicoletti et al. 2003).<sup>1</sup>

The mechanisms in which exit costs in form of labor market rigidities affect the location and scale of FDI have been formally modeled by Haaland et al. (2003) based on the assumption of an uncertain environment. Moreover, the studies of Görg (2005) and Dewitt et al. (2009) explore the presence of amplifying effects of a country's riskiness and investment costs on the FDI impact of rigid labor markets.

However, it is conceivable that the negative impact of high adjustment and exit costs due to rigid labor markets on FDI is amplified by a host location's low-skill intensity: High adjustment and exit costs in form of rigid labor markets prevent firms from reacting to changes in comparative advantage and location factors. As the supply of low-skilled labor is

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<sup>1</sup> It has to be stressed that another argument -theoretically established and empirically tested by Dewitt et al. (2009) - relates to domestic anchorage, i.e. the decision whether to engage in FDI. According to this argument, a high domestic level of employment protection tends to discourage outward FDI (anchoring effect of employment protection legislation). This is, however, not the argument here. We are rather concerned with "pull effects" of lax employment protection legislation due to low adjustment and exit costs.

abundant compared to that of high-skilled labor<sup>2</sup> it is likely that FDI into low-skill intensive industries is more sensitive to such changes in comparative advantage or location factors. Therefore high adjustment and exit costs might be of greater relevance for MNEs undertaking FDI in low-skill industries leading to a larger negative impact of rigid labor markets on FDI into low-skill intensive industries.<sup>3</sup> On the contrary, high-skilled labor is relatively scarce and thus higher search costs imply a lower sensitivity of FDI into high-skill industries to alterations in the locational quality.

Although the inflexibility of the labor market can arise from various labor market institutions we focus in this paper on a country's employment protection legislation which is the central part of the legal stipulations towards the labor market.<sup>4</sup> Employment protection encompasses regulations, either legislated or written in labor contracts that limit the employer's ability to hire or fire workers without delay or cost (Pissarides 2001; OECD 2004).

Labor standards and employment protection legislation in particular are largely in the realm of nation states. Thus, employment protection legislation is an instrument which allows jurisdictions to compete for FDI. Moreover, countries typically differ in their preferences for labor standards. Table 1a shows the level of employment protection legislation in selected OECD / EU countries<sup>5</sup>, based on the overall summary index (version 1) developed by the OECD (see OECD 1999 and 2004). This index captures regulations towards both, regular and temporary employment. The index ranges from zero (very low labor market protection) to 6 (very high labor market protection).

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<sup>2</sup> Low skilled (untrained) labor is frequently described as a type of a location's "natural asset" – in contrast to more scarce "created assets" like skilled (trained) labor (see e.g. Dunning and Narula 1995).

<sup>3</sup> While in principle, low-skilled labor is employed within certain segments of every industry, it is also possible to differentiate between industries (see Peneder 2007 for a widely used industry classification) and rank them by their skill intensity. Typical examples of low-skill intensive industries are the food, textiles and the wood industries.

<sup>4</sup> Besides employment protection legislation the trade union density and coverage, the level of wage bargaining and the taxation of labor income are frequently used to characterize the flexibility of labor markets.

<sup>5</sup> The choice of countries and years is dictated by data quality and quantity (see section 3 for additional details).

Table 1a: Stringency of overall employment protection legislation in selected countries

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AUT	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	1.93	1.93	1.93
CZE	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
FIN	2.17	2.09	2.09	2.09	2.09	2.09	2.02	2.02	2.02	2.02	2.02
FRA	2.98	2.98	2.98	2.98	2.98	2.98	3.05	3.05	3.05	3.05	3.05
GER	3.09	3.09	2.46	2.46	2.46	2.46	2.46	2.35	2.35	2.21	2.21
HUN	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.52	1.52	1.52
NLD	2.73	2.73	2.73	2.73	2.12	2.12	2.12	2.12	2.12	2.12	2.12
SVK	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.34	1.34	1.34
SVN	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.50	2.50	2.50
GBR	0.60	0.60	0.60	0.60	0.60	0.68	0.68	0.75	0.75	0.75	0.75
USA	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21

The USA and GBR have the lowest labor market standards in force throughout the sample period. The strictest regulations are stipulated in FRA, GER and SVN. Table 1a shows that 6 countries (AUT, FIN, GER, NLD, SVK, SVN) have substantially eased their employment protection legislation over time. Three countries (FRA, HUN and GBR) have increased and in two countries (CZE and USA) the index stays constant. Among the latter two groups are those countries which already had comparable lax employment protection legislation in force in 1995 (i.e. HUN, GBR, USA).

Table 1b: Stringency of employment protection legislation for regular employment

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AUT	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.37	2.37	2.37
CZE	3.31	3.31	3.31	3.31	3.31	3.31	3.31	3.31	3.31	3.31	3.31
FIN	2.47	2.31	2.31	2.31	2.31	2.31	2.17	2.17	2.17	2.17	2.17
FRA	2.34	2.34	2.34	2.34	2.34	2.34	2.47	2.47	2.47	2.47	2.47
GER	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68	2.68
HUN	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92
NLD	3.08	3.08	3.08	3.08	3.05	3.05	3.05	3.05	3.05	3.05	3.05
SVK	2.47	2.47	2.47	2.47	2.47	2.47	2.47	2.47	2.31	2.31	2.31
SVN	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	2.70	2.70	2.70
GBR	0.95	0.95	0.95	0.95	0.95	1.12	1.12	1.12	1.12	1.12	1.12
USA	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17

Tables 1b and 1c depict the developments of the sub-indices capturing regulations towards regular and temporary employment. Three countries (NLD, SVK and SVN) have eased legislation for both types of employment. Interestingly, NLD and SVK have especially eased regulations towards temporary employment and SVN those towards regular employment. Two countries have tightened their regulation towards temporary employment over time (HUN and GBR) and the index for regular employment has soared in FRA and GBR. Furthermore, the tables show that GER has eased regulations towards temporary employment with unchanged regulations for regular employment and vice versa for AUT and FIN.

Table 1c: Stringency of employment protection legislation for temporary employment

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AUT	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
CZE	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
FIN	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88
FRA	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63
GER	3.50	3.50	2.25	2.25	2.25	2.25	2.25	2.03	2.03	1.75	1.75
HUN	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	1.13	1.13	1.13
NLD	2.38	2.38	2.38	2.38	1.19	1.19	1.19	1.19	1.19	1.19	1.19
SVK	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	0.38	0.38	0.38
SVN	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.30	2.30	2.30
GBR	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.38	0.38	0.38	0.38
USA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

Taken together, Tables 1a-c signal that a wide variety of levels of employment protection from which potential foreign investors may choose exists. Moreover heterogeneous developments over time are given.

Against this background the current study investigates the relationship between rigid labor markets in form of strict employment protection legislation and FDI in a panel of major host countries for inward FDI-stock at the industry level. We add to the existing literature by testing the conditional hypothesis that the negative impact of strict employment protection legislation on FDI differs across industries due to differences in the skill composition of the workforce. Our prior expectation is that the adverse effect of rigid labor markets on FDI is larger in industries with a higher share of low-skilled employment due to the greater importance of adjustment and exit costs.

In line with previous literature we find that employment protection legislation, especially stipulations towards regular employment, has a negative impact on FDI. However, we also find evidence that the deterrent effect of inflexible labor markets is larger for industries with relatively high shares of low-skilled workers employed.

The paper is structured as follows: Related empirical literature is summarized in section II. Section III. describes the empirical methodology applied and the data used. Section IV. presents the results and section V. concludes.

## II. REVIEW OF RELATED EMPIRICAL LITERATURE

This section briefly summarizes main features of related studies. Haaland et al. (2003) use firm level data on subsidiaries of Western MNEs located in the manufacturing sector in three Central and East European countries (CEECs) for the period 1994 to 1997 to test the validity of their theoretical exit cost model. They find that labor market flexibility, measured by the excess job reallocation rate has a significant negative impact on the FDI decisions of MNEs.

Javorcik and Spatareanu (2005) study the importance of labor market characteristics using firm level data covering the period 1998 to 2001. Their sample includes firms from Western and Eastern European host countries of FDI. As proxies for labor market flexibility they use data from the Global Competitiveness Report as well as data compiled by Djankov et al. (2001). Overall, Javorcik and Spatareanu (2005) find that the higher the flexibility of the labor market in the host country the more MNEs invest in the country.

Görg (2005) studies to what extent labor market regulations matter for the location of US outward FDI-stocks in manufacturing in 33 host countries over the period 1986 to 1996. The analysis is based on data from the Global Competitiveness Report to proxy labor market flexibility. Görg (2005) concludes that tight labor market regulation has a negative impact on FDI location decisions. Moreover, Görg (2005) explores whether the riskiness of a country amplifies the negative effect of tight labor market regulations as argued by Haaland et al. (2003). Yet, he does not find any amplifying effect.

Benassy-Quéré et al (2007a) apply a gravity model framework to analyze the impact of institutions in a broad sense on FDI. They relate bilateral FDI-stocks to various institutional variables for a broad range of countries, mainly developing countries. Among the variables analyzed, three measures for the degree of labor market regulation are included. These proxies are taken from the Fraser Institute database and the Institutional Profile database of the French Ministry of Finance. For two of these three variables Benassy-Quéré et al (2007a) find a significant negative impact on FDI. However, the coefficient of the third variable, which proxies the regulation of the labor market, enters insignificantly in their empirical model. Overall, however, they conclude that labor market rigidity has an adverse effect on FDI.

Benassy-Quéré et al (2007b) analyze sector-level data on US outward FDI-stocks for the period 1994 to 2002 in 18 Western and Eastern European countries. They also use data from the Fraser Institute as proxies for labor market flexibility and find only weak evidence for a

significant impact of labor market flexibility on FDI. Their proxy for labor market flexibility is significant only in a few cases and in these cases it enters with a positive coefficient.

Radulescu and Robson (2008) explain FDI-flows and also find support for the hypothesis that the strictness of employment protection legislation has a negative effect on FDI. They base their analysis on a sample of 19 OECD countries for the period 1975-1997. Their proxy for stringency of employment protection legislation is based on the Blanchard and Wolfers (2000) index.

Gross and Ryan (2008) find that employment protection matters in the foreign location choice of Japanese investors. There is a clear negative impact from strict legislation of regular employment on FDI-related employment size while the impact of the legislation on temporary employment is much weaker. They use the OECD index in their analysis.

Another study also applying the OECD index is Leibrecht and Scharler (2009). These authors use a panel of bilateral FDI-flows to seven CEECs over the period 1995-2004 and find that tight employment protection legislation does not exert a statistically significant impact on FDI once a proxy for unit labor costs is included in their empirical model. They conclude that the labor markets in the CEECs are not rigid enough to impose sizable exit costs. They argue that the low level of employment protection is also due to the still weak enforcement of labor laws in CEECs.

Finally, Dewitt et al. (2009) provide estimates for the impact of differences in employment protection legislation between home and host countries of FDI. Based on an analysis of bilateral outward FDI-stocks of OECD countries for the period from 1986 to 1995 they find a negative impact of an increasing employment protection legislation differential between home and host country. They apply the same measure for labor market flexibility as Görg (2005) as well as the OECD index for employment protection stringency. Dewitt et al. (2009) also explore whether the negative impact of an increasing employment protection legislation differential is amplified by an increase in the level of investment costs (cost of capital index). However, they do not find such an amplifying effect.

### III. EMPIRICAL MODEL AND METHODOLOGY, VARIABLES AND DATA ISSUES

#### 1. Empirical Model and Methodology

The current study is based on inward FDI-stocks in industrial sectors. The empirical model relates the logarithm of the inward FDI-stock of country  $i$  and industry  $j$  in year  $t$  to a set of location factors:

$$\ln\text{FDI}_{ijt} = b_1 + b_2X_{it} + b_3Z_{ijt} + b_4I_{ijt} + c_t + a_{ij} + e_{ijt} \quad (1)$$

The matrix  $X_{it}$  contains FDI-relevant location factors which vary over countries and over time and  $Z_{ijt}$  includes variables varying over time and over country-industry pairs. The former reflect the economic environment which is the same across all industries, while the latter group of variables reflects specific industry conditions. The former matrix includes different proxies for a host country's level of employment protection legislation (henceforth  $\text{EPL}_{it}$ ). The latter matrix contains a variable (henceforth  $\text{HLS}_{ijt}$ ) signaling the low-skill intensity of a particular industrial sector-country pair. Note, the variables contained in matrices  $X_{it}$  and  $Z_{ijt}$  are specified in logs (to reduce the impact of outliers) and enter in a one-year lagged form (to consider that contemporary FDI reacts to certain information on location factors with a time lag (see Bevan and Estrin 2004) and to account to some degree for endogeneity (see Wooldridge 2002)<sup>6</sup>).

$c_t$  denotes a matrix of  $(T - 1)$  time dummies and  $a_{ij}$  are  $(n - 1)$  country-industry-pair-specific fixed effects capturing the impact of time-invariant country, industry and country-industry factors.  $e_{ijt}$  is the remainder error term.

To test the hypothesis that the effect of strict employment protection legislation on FDI differs across industries due to differences in the skill composition of the workforce we include an interaction term between  $\text{EPL}_{it}$  and  $\text{HLS}_{ijt}$  in the empirical model. The vector  $I_{ijt}$  captures this interaction effect.

The use of interaction terms is justified whenever conditional hypotheses are tested (e.g. Brambor et al. 2006). Including an interaction effect in our empirical model allows us to

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<sup>6</sup> Note, to explore the importance of the endogeneity issue we also apply an Arellano-Bond-type-GMM estimator as a robustness check (cf. Table 6).

directly explore the impact of  $EPL_{it}$  on  $FDI_{ijt}$  at various levels of  $HLS_{ijt}$ .<sup>7</sup> In particular, based on Equation 1 the effect of  $EPL_{it}$  on  $FDI_{ijt}$  is derived as follows:

$$\delta \ln FDI_{ijt} / \delta \ln Epl_{it} = b_2 + b_4 \ln HLS_{ijt} \quad (2)$$

Equation 2 contains several important aspects for the interpretation of interaction models. First, it is evident that coefficients in interaction models (here  $b_2$  and  $b_3$ ) no longer show the marginal effect of the variables entering the interaction effects. Specifically, coefficient  $b_2$  captures the effect of a change in  $EPL_{it}$  if  $\ln HLS_{ijt} = 0$ . That is, this coefficient shows the impact of  $EPL_{it}$  if only higher skilled workers are engaged in the production process. Thereby, one should bear in mind that  $\ln HLS_{ijt} = 0$  if  $HLS_{ijt} = 1\%$ . Yet, the minimum value of  $HLS_{ijt}$  in our sample is about 4.3% and the mean value is about 22%. Thus, the value of coefficient  $b_2$  is per se not meaningful. Rather, one needs to evaluate the marginal effect of  $EPL_{it}$  on FDI at different values of  $HLS_{ijt}$  multiplied by coefficient  $b_4$ . Coefficient  $b_4$  signals how the marginal impact of  $EPL_{it}$  on  $FDI_{ijt}$  changes if more low-skilled workers are employed.

A second aspect concerns the statistical significance of coefficients in interaction models. Specifically, it is likely that  $EPL_{it}$  has a statistically significant impact on FDI at meaningful levels of  $HLS_{ijt}$  even if  $b_2$ ,  $b_4$  or both coefficients are not statistically different from zero (see Brambor et al. 2006 for details). To cope with this possibility we also present graphs showing not only the marginal effect of  $EPL_{it}$  on FDI at various levels of  $HLS_{ijt}$  but also its statistical significance (also see Wooldridge 2003, p. 194f on this issue).

To reduce the possibility of an omitted variable bias and to explore the robustness of our results to inclusion and exclusion of variables we apply a “general-to-specific-approach” starting with the most general model (including all location factors considered), the full model, and testing down until only statistically significant variables remain. Note, that we generally conduct one-sided tests with the alternative hypothesis based on the expected sign of the coefficient (cf. Table 2). The significance of coefficients with an *a priori* ambiguous sign is based on two-sided tests. Standard errors are calculated using a non-parametric

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<sup>7</sup> To model conditional hypotheses via interaction effects receives increasing attention in the empirical literature. For instance, Dewitt et al. (2009) and Görg (2005) also use interactions effect in their analysis.

bootstrap approach over clusters (country-industry-pairs) and are thus fully robust with respect to heteroscedasticity and serial correlation.

## 2. Variables and Data issues

### i. Dependent variable: $\ln\text{FDI}_{ijt}$

We use the inward FDI-stocks of 10 manufacturing sectors in millions of current Euro as dependent variable. The data is taken from Eurostat's New Cronos database and the wiiw Database on Foreign Direct Investment (for CEECs).

### ii. Variables of main interest

#### a. Interaction between $\ln\text{EPL}_{it}$ and $\ln\text{HLS}_{ijt}$ : $I_{ijt}$

The interaction term is defined as the product of  $\ln\text{EPL}_{it}$  times  $\ln\text{HLS}_{ijt}$ . Given our prior expectations that tight employment protection legislation will affect FDI more negatively in low-skill intensive industries the coefficient of  $I_{ijt}$  should be negatively signed.

#### b. Employment protection legislation: $\text{EPL}_{it}$

We proxy the stringency of  $\text{EPL}_{it}$  with the indices developed and discussed in OECD (1999 and 2004). For Slovenia the data are obtained from Leibrecht and Scharler (2009; Table 2). Three different  $\text{EPL}_{it}$  indices are used: an overall summary index (henceforth  $\text{Eplov}_{it}$ ), a sub-index for protection of regular workers ( $\text{Eplreg}_{it}$ ) and a sub-index for regulations towards temporary employment ( $\text{Epltemp}_{it}$ ).

The methodology for calculating the three  $\text{EPL}_{it}$  indicators is detailed in OECD (2004) so we do not elaborate on this issue here. Yet, it is important to stress that we use version 1 of the  $\text{EPL}_{it}$  index. The OECD has also developed a version 2 index which captures regulations towards collective dismissals. However, due to lack of data we do not use the version 2 index in our analysis. Specifically, annual time series data for the version 1 index is available from 1985-2008 whereas version 2 indices are available for most countries from 1998 onwards

only. The version 1 index for  $Epl_{it}$  is calculated as unweighted average of the two sub-indices, which are themselves based on a weighted average of different variables.<sup>8</sup>

Advantages of the OECD index over other proxies for the stringency of employment protection legislation are that it is available in panel data form; that it is derived on an internationally comparable basis and that sub-indices, isolating the importance of different dimensions of labor market rigidity, are available.

Given that a higher level of  $EPL_{it}$  (that is tighter employment protection regulations) implies higher adjustment and exit costs it should be negatively related with FDI independently of an industry's skill intensity (i.e a negative direct effect of  $EPL_{it}$  is expected).

c. Share of low-skilled workers employed:  $HLS_{ijt}$

The share of low-skilled hours in total hours worked,  $HLS_{ijt}$ , is used as a proxy for the low-skill intensity of an industry. Skill variables are frequently used independently of any  $EPL_{it}$  to disentangle the underlying motive for FDI; i.e. whether it is vertically or horizontally motivated (e.g. Markusen and Maskus 2002; Davies 2008). In the first case the coefficient of  $\ln HLS_{ijt}$  should be positive. In this case MNEs exploit differences in factor endowments. In the second case, the sign should be negative, as firms duplicate plants (e.g. Barba Navaretti and Venables 2004, Chap. 2). Thus, in principle the sign of the  $\ln HLS_{ijt}$  coefficient is indeterminate *a priori*. However, the majority of empirical studies finds that FDI is more horizontally than vertically motivated, especially in case of OECD countries (e.g. Davies 2008; Bloningen et al. 2003). Thus, we expect the coefficient of  $\ln HLS_{ijt}$  to carry a negative sign. Data is taken from the EUKLEMS database.

**iii. Control variables**

The choice of control variables included in matrices  $X_{it}$  and  $Z_{ijt}$  is done with a focus on FDI theories (see Faeth 2009 for an overview). However, FDI theories provide only a rough guide for the choice of control variables. Therefore we base our selection of these variables mainly on related empirical studies (e.g. Markusen and Maskus 2002; Görg 2005; Benassy- Quéré et al. 2007a, b).

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<sup>8</sup> Note that for Slovenia the available  $Epl_{it}$  follows the version 2 index. However, as the version 1 index is the simple unweighted average of  $Epl_{reg,it}$  and  $Epl_{temp,it}$  an unweighted average of these two variables is used as  $Epl_{it}$  in case of Slovenia.

Specifically, we include a proxy for market size ( $Pot_{it}$ ), GDP per capita ( $GDPcap_{it}$ ), the average effective tax rate on corporate profits ( $EATR_{it}$ ), public R&D expenditures as percent of GDP ( $Govgerd_{it}$ ), the political risk level ( $Risk_{it}$ ), the macroeconomic risk level ( $Cpi_{it}$ ), the information and communication (ICT) infrastructure endowment ( $Ict_{it}$ ), and the level of legal barriers to FDI ( $Freefdi_{it}$ ) in the matrix  $X_{it}$ . Control variables entering  $Z_{ijt}$  are labor costs ( $Labcost_{ijt}$ ) and labor productivity ( $Labprod_{ijt}$ ).

Variable  $Pot_{it}$  captures market size, and is expected to be positively correlated with FDI. The sign of the coefficient of  $GDPcap_{it}$  might be considered as ambiguous *a priori* (e.g. Benassy-Quéré et al. 2007a), pointing towards its role as a “catch-all” variable: On the one hand it might represent effects of labor costs on production costs (e.g. Mutti and Grubert 2004), implying a negatively signed coefficient. On the other hand, it captures positive effects on an FDI’s profit level via a favorable infrastructure endowment (e.g. Mutti 2004), a country’s purchasing power and labor productivity (e.g. Mutti and Grubert 2004), as well as better institutions and less economic and political risk (e.g. Benassy-Quéré et al. 2007a).

As we include most of these underlying variables in our model  $GDPcap_{it}$  is intended to capture FDI effects of an increasing purchasing power in our application (also see Görg 2005). Thus, a positively signed coefficient is expected.

Labor costs partly reflect to what extent FDI location decisions are driven by efficiency considerations. An increase in  $Labcost_{ijt}$ , *ceteris paribus*, increases production costs. We therefore expect a negatively signed coefficient. In addition, an increase in  $Labprod_{ijt}$  should impact positively on FDI, not least via its favorable impact on unit production costs.

The change in the consumer price index,  $Cpi_{it}$ , is used as a proxy for macroeconomic risk as a high inflation rate indicates macroeconomic uncertainty which deters FDI. Yet, as our endogenous variable is measured in nominal terms higher inflation rates might also have a positive impact on the volume of FDI (Buch and Lipponer 2007). Thus the sign of this variable’s coefficient is ambiguous *a priori*.

Similarly to  $Cpi_{it}$  a higher level of political risk,  $Risk_{it}$ , should impact negatively on FDI. Yet, due to the particular definition of the measure of  $Risk_{it}$  used we expect a positively signed coefficient. The variable  $Freefdi_{it}$  is intended to capture legal barriers to inward FDI. Legal barriers to FDI are lower the higher the score of  $Freefdi_{it}$ . Thus, we expect a positive sign for this variable.

The variable  $EATR_{it}$  is a summary measure for the taxation of FDI proceeds capturing both, the tax burden on a very profitable as well as on a marginal investment. More specifically, the after-tax profit from FDI is directly determined by the average tax rate (see Devereux and Griffith 1998a). A higher  $EATR_{it}$  implies lower after-tax profits and thus lower incentives to invest in a particular location. Thus, a negatively signed coefficient is expected.

As an increasing part of FDI constitutes R&D related activities (see e.g. Guimón 2009) a high level of public expenditures on R&D should be relevant for an MNE's location decision. Specifically, a country's R&D level can be considered as a type of public good with positive spill-over effects on firms. These in turn increase productivity without causing additional costs and lead to a higher profitability of an investment. Thus, an increase in the public R&D expenditures in GDP ( $Govgerd_{it}$ ) should have a positive impact on FDI.

A country's endowment with material infrastructure is generally considered to have a positive impact on FDI. Thereby a favorable endowment with ICT-infrastructure has been frequently shown to be particularly relevant for FDI attraction (e.g. Bellak et al. 2009; Mollick et al. 2006). Therefore we include a variable,  $Ict_{it}$ , capturing a country's endowment with ICT-infrastructure in the empirical model. However, it should be stressed, that other FDI relevant infrastructure components, like the transport or the power generation infrastructure, are captured to some extent by  $GDPcap_{it}$ . Moreover, as these infrastructure components are only slowly evolving over time, they also might be captured by the country-industry-specific fixed effects,  $a_{ij}$ , included in our empirical model.

#### iv. Data Issues

Our sample includes the countries listed in Tables 1a-c for the period 1995-2005 and in 10 industrial sectors DA, DB, DD/DE, DG, DH, DJ – DM (Nace Revision 1 classification).<sup>9</sup> Focusing on inward FDI-stock to the manufacturing sector implies that substantial shares of employment and of gross fixed capital formation in the host countries are covered by our analysis: The minimum share in domestic employment (in manufacturing sector national total<sup>10</sup>) is 6% in GER in 1998 and the maximum share is 44% in SVK in 2005; the minimum

<sup>9</sup> Industries DA, DB, DD/DE are typical examples of industries employing rather high shares of low-skilled workers. The mean values of  $Hls_{ijt}$  (1995-2005) are 25%, 25% and 41%. In the other industries the corresponding values are lower ranging from 16% (DK-DM) to 20% (DJ and DH).

<sup>10</sup> See:

[http://stats.oecd.org/OECDStat\\_Metadata/ShowMetadata.ashx?Dataset=AFA\\_CALC\\_IN3&ShowOnWeb=true&Lang=en](http://stats.oecd.org/OECDStat_Metadata/ShowMetadata.ashx?Dataset=AFA_CALC_IN3&ShowOnWeb=true&Lang=en).

share in domestic gross fixed capital formation is 6.5% in FIN and the maximum share is 70% in HUN and NLD in 2005.

The choice of years and countries is predominantly driven by data issues. FDI and EUKLEMS data was available until 2005 and data from the EUKLEMS database is only available from 1995 onwards for a couple of countries. FDI data at the industrial level have many missing values for a range of countries (e.g. Greece, Japan, Portugal and Switzerland). Moreover data on several exogenous variables are lacking for some countries. Especially data on  $EATR_{it}$  was available at an internationally comparable basis only for the countries included plus Italy, Poland, Romania, Bulgaria and Croatia. However, these countries are excluded for the following reasons: Data on  $HLS_{ijt}$  for Italy is questionable as rather low percentages of low-skilled workers employed are shown in the EUKLEMS database for this country; Poland is an “outlier” in the type of FDI received -most FDI is going into the primary and the tertiary sector; EUKLEMS data are not available for Romania, Bulgaria and Croatia.

Table 2 summarizes the above discussions with respect to the variables used also including the rationale behind these variables. It provides the expected sign of the estimated coefficients, the data sources used and a detailed description of the measurement and definition of the variables. Note, that only for one variable the expected sign is ambiguous *a priori* ( $Cpi_{it}$ ). Table 3 includes some descriptive statistics for the variables used in the analysis and Table 4 shows their pairwise correlations. Some correlations are rather pronounced, especially those with  $GDPcap_{it}$  which is consistent with the “catch all” character of this variable. We check the sensitivity of the results to this correlation in our estimations by excluding  $GDPcap_{it}$  in one specification (see Table 6, M2).

Table 2: Variable rationale, variable description and summary statistics

Variable	Rationale	Exp. Sign	Definition	Source
$FDI_{ijt}$	Endogenous variable.		Inward FDI-stock of 10 manufacturing sectors in mn of current Euro	Eurostat's New Cronos database and wiiw Database on FDI (for CEECs)
$Pot_{it}$	Larger markets should experience more inward FDI. Opportunities to generate profits are higher.	+	Own market potential; calculated as follows: $POT = (GDP / \text{internal distance})$ GDP in mn of current Euro	Eurostat's New Cronos database; CEPII internal distance measures: <a href="http://www.cepii.org/anglaisgraph/bdd/distances.html">http://www.cepii.org/anglaisgraph/bdd/distances.html</a>
$GDPcap_{it}$	Captures positive effects of higher purchasing power on FDI.	+	GDP per capita in Euro15-PPP	Eurostat's New Cronos database
$EATR_{it}$	A higher effective tax rate should decrease inward FDI, since it directly impacts negatively on the after-tax profit level of an FDI.	-	Effective average tax rate (in percent)	Own calculations based on Devereux and Griffith 1998b; assumptions follow Devereux and Griffith as well as the IFS data available under <a href="http://www.ifs.org.uk/publications.php?publication_id=3210">http://www.ifs.org.uk/publications.php?publication_id=3210</a> ; raw tax data are taken from the European Tax Handbook and KPMG's Corporate Tax Rate Surveys
$Govgerd_{it}$	Higher R&D expenditures in GDP should encourage inward FDI due to knowledge spill-over effects.	+	Government-financed expenditures on R&D in percent of GDP	OECD's Main Science and Technology Indicators database
$Freefdi_{it}$	Higher legal barriers towards FDI directly imply less inward FDI.	+	index ranges from 0 – 100 higher value means less restrictions	The Heritage Foundation <a href="http://www.heritage.org/index/faq.aspx">http://www.heritage.org/index/faq.aspx</a>
$HLS_{ijt}$	Depending on the motive of FDI, this	-	Share of low-skilled employees in total	EUKLEMS database

Variable	Rationale	Exp. Sign	Definition	Source
	variable signals either higher incentives to fragment production (vertical FDI) or lower possibilities to duplicate plants (horizontal FDI). Yet, empirically horizontal FDI is dominating.		employment	
Labcost <sub>ijt</sub>	Higher labor costs imply higher production costs and thus lower FDI.	–	Compensation of employees (in millions of Euro) / Total hours worked by employees (millions)	EUKLEMS database
Labprod <sub>ijt</sub>	Higher labor productivity attracts FDI via its favorable effect on production costs.	+	Gross value added in Euro15-PPP/ Total hours worked	EUKLEMS database
Ict <sub>it</sub>	Larger ICT-infrastructure endowment lowers production costs and thus increases FDI.	+	Sum of telephone mainlines, mobile phone subscribers, internet connections and personal computers per 1000 inhabitants	World Banks's World Development Indicators database
Epl <sub>it</sub> *	Tighter employment protection legislation increases adjustment and exit costs.	–	Indicators of the strictness of employment protection legislation (version 1) Scale: 0-6 with higher scores representing stricter regulation	OECD's Labor market statistics database; <a href="http://www.oecd.org/employment/protection">www.oecd.org/employment/protection</a> ; for SVN source is Leibrecht and Scharler (2009) Table 2
I <sub>ijt</sub> **	Stricter employment protection legislation matters particularly for industries with a large share of low-skilled workers employed.	–	Interaction effect between HLS <sub>ijt</sub> and the different types of Epl <sub>it</sub> *	See sources for HLS <sub>ijt</sub> and Epl <sub>it</sub>

Variable	Rationale	Exp. Sign	Definition	Source
Risk <sub>it</sub>	Politically riskier countries should receive less inward FDI due to higher uncertainty and larger possibilities of expropriation.	+***	Political risk ( 0 = high; 25 = low)	Euromoney
Cpi <sub>it</sub>	Riskier countries should receive less inward FDI due higher uncertainty; Yet one has to bear in mind that the endogenous variable is denominated in nominal terms.	?	Change in consumer price index	Eurostat's New Cronos database

Notes: \* Epl<sub>it</sub> captures all three proxies for employment protection legislation used in the analysis; \*\* interaction term of lnHLS<sub>ijt</sub> with each of the three indices contained in Epl<sub>it</sub>;

\*\*\* positive sign due to measurement

Table 3: Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max
LnFDI	Overall	7.19	1.93	0.62	11.89
	Between		1.83	3.25	11.43
	Within		0.61	3.68	10.22
lnPot	Overall	7.52	1.33	5.20	9.19
	Between		1.32	5.57	9.11
	Within		0.18	7.04	7.96
lnGdpcap	Overall	9.86	0.37	8.91	10.48
	Between		0.35	9.21	10.33
	Within		0.14	9.57	10.13
lnIct	Overall	7.16	0.55	5.55	7.90
	Between		0.32	6.50	7.75
	Within		0.45	6.20	8.12
lnEatr	Overall	3.29	0.24	2.75	3.64
	Between		0.22	2.83	3.58
	Within		0.10	2.72	3.54
lnGovgerd	Overall	-0.50	0.33	-1.38	-0.04
	Between		0.32	-1.18	-0.13
	Within		0.10	-0.82	-0.21
lnLabcost	Overall	2.53	0.93	0.32	4.30
	Between		0.93	0.65	4.02
	Within		0.19	1.90	3.24
lnLabprod	Overall	3.26	0.66	1.46	5.58
	Between		0.65	1.57	4.86
	Within		0.19	2.22	4.21
lnHls	Overall	2.95	0.56	1.46	4.23
	Between		0.55	1.84	4.11
	Within		0.12	2.45	3.22
lnEplov	Overall	0.44	0.77	-1.57	1.13
	Between		0.76	-1.57	1.10
	Within		0.08	0.21	0.64
lnEplreg	Overall	0.63	0.84	-1.79	1.22
	Between		0.84	-1.79	1.20
	Within		0.05	0.44	0.72
lnEpltemp	Overall	0.07	0.89	-1.39	1.29
	Between		0.86	-1.39	1.29

	Within		0.21	-0.81	0.51
lnRisk	Overall	3.05	0.21	2.51	3.22
	Between		0.20	2.65	3.21
	Within		0.06	2.72	3.27
lnFreefdi	Overall	4.19	0.19	3.40	4.50
	Between		0.16	3.81	4.35
	Within		0.10	3.78	4.49
lnCpi	Overall	0.97	0.87	-1.97	2.91
	Between		0.75	-0.01	2.26
	Within		0.46	-1.20	1.95
N = 1016	n = 108	T-bar = 9.4			

Note: For convenience time, country and industry identifier not included.

Table 4: Correlation Matrix

	lnPot	lnGdpcap	lnIct	lnEatr	lnGovgerd	lnLabcost	lnLabprod	lnHLS	lnEplov	lnEplreg	lnEpltemp	lnRisk	lnFreefdi	lnCpi
lnPot	1.00													
lnGdpcap	0.82	1.00												
lnIct	0.52	0.80	1.00											
lnEatr	0.50	0.32	-0.07	1.00										
lnGovgerd	0.66	0.78	0.47	0.30	1.00									
lnLabcost	0.82	0.89	0.64	0.31	0.80	1.00								
lnLabprod	0.55	0.63	0.48	0.27	0.51	0.80	1.00							
lnHLS	0.14	0.17	0.04	-0.15	0.44	0.23	0.00	1.00						
lnEplov	-0.31	-0.28	-0.19	-0.12	-0.01	-0.13	-0.15	0.29	1.00					
lnEplreg	-0.41	-0.40	-0.24	-0.19	-0.21	-0.28	-0.25	0.18	0.95	1.00				
lnEpltemp	-0.08	-0.02	-0.06	0.00	0.32	0.16	0.05	0.44	0.85	0.67	1.00			
lnRisk	0.85	0.91	0.64	0.30	0.82	0.90	0.60	0.28	-0.20	-0.31	0.04	1.00		
lnFreefdi	0.35	0.33	0.35	0.25	0.09	0.27	0.25	-0.21	-0.26	-0.15	-0.36	0.39	1.00	
lnCpi	-0.65	-0.70	-0.49	-0.41	-0.69	-0.74	-0.47	-0.25	0.00	0.10	-0.16	-0.77	-0.29	1.00

Note: For convenience time, country and industry identifier not included.

## IV. RESULTS

We start by commenting briefly on the control variables. The remainder of the results section is organized by the three types of  $Epl_{it}$ .

### 1. Control variables

Table 6 (M1 and M4) shows that we control for many different cost- and market-related determinants of FDI. In particular, Table 6 implies that the countries in our sample are host countries of FDI where (i) political and macroeconomic risk does not play a role; where (ii) relevant restrictions on FDI hardly exist anymore and where (iii) FDI are not productivity driven, but primarily labor cost driven. FDI directed to these countries reacts significantly positive to an increase in market size and purchasing power, as well as to an improvement of ICT-infrastructure and significantly negative to an increase in labor costs and taxes. These results are not implausible when compared to related empirical literature on the determinants of FDI (e.g. Bevan and Estrin, 2004). Moreover, the coefficients, which all represent elasticities, are of an economically meaningful size. Note, that Model (M1) includes the variable  $GDPcap_{it}$ , which due to its nature described above, may partly reflect other location factors included, e.g. infrastructure endowment or the risk level. Therefore, we re-estimate (M1) by excluding  $GDPcap_{it}$ . (M2) shows that dropping  $GDPcap_{it}$  changes only little.

### 2. Variables of main interest

Starting with  $Epl_{it}$  Table 6 suggests that strict employment protection has a direct, not interacted, negative effect on inward FDI-stock (see M1-M3).<sup>11</sup> The size of the coefficient on  $Epl_{it}$  (M1 -0.48 and similar sizes of coefficients in M2 and M3) implies that a 1% increase in the index of employment protection would lead to an almost 0.5% reduction in inward FDI-stocks. These results are consistent with the findings of prior empirical literature (see section 2).<sup>12</sup>

Before we turn to the interaction effect, a few words on the second variable which constitutes the interaction effect, i.e.  $HLS_{ijt}$ , are in order. Referring to Table 6 (M1-M5)  $\ln HLS_{ijt}$

<sup>11</sup> Note that model (M1) contains the full set of controls variables whereas stepwise exclusion of statistically insignificant variables leads to our preferred specifications (M3 and M5).

<sup>12</sup> For model (M3) the results of a bootstrapped Hausman-test (HT) is reported which shows that the  $H_0$  (i.e. Random Effects assumptions are valid) is rejected.

consistently carries a negative sign with an elasticity of 0.4-0.5. The negative sign points to the prevalence of horizontal FDI where firms duplicate their domestic activities abroad. This finding is plausible as the host countries included in our sample receive most of inward FDI from countries of similar level of development.<sup>13</sup>

The interaction effect,  $I_{ijt}$ , shows a negatively signed coefficient which is also statistically significant. Moreover, the F-test reported in Table 6 (M4 and M5) signals that the coefficients for  $\ln\text{Eplov}_{it}$  and  $I_{ijt}$  are jointly statistically significant different from zero at the 5% significance level, which underpins the effects derived. These results are consistent with the view that the impact of strict employment protection indeed increases with the share of low-skilled workers employed.

Note, that the coefficient on  $\text{Eplov}_{it}$  carries an unexpected positive sign in models (M4) and (M5). However, this coefficient shows the effect of a change in  $\text{Eplov}_{it}$  if  $\text{HLS}_{ijt} = 1\%$ . As already noted this value of  $\text{HLS}_{ijt}$  is not included in our sample. Moreover, as stressed by Kennedy (2005; example 8) it is not unusual that one of the interacting variables carries the “wrong” sign, with the model nevertheless showing the expected marginal effects over a meaningful range of sample values (cf. Figure 1).

As already stressed the marginal effect of  $\ln\text{Eplov}_{it}$  cannot be taken directly from the values given in Table 6 but needs to be calculated according to Equation 2 with changing values of  $\ln\text{HLS}_{ijt}$ . For instance, evaluated at the mean value of  $\ln\text{HLS}_{ijt}$  of about 2.95 the coefficients given in model (M5) imply that a 1% increase in  $\text{Eplov}_{it}$  would lead to a decrease in FDI by about 0.5%.<sup>14</sup> More generally, Figure 1 displays size and significance of the marginal effect of  $\ln\text{Eplov}_{it}$  across the range of sample values of  $\ln\text{HLS}_{ijt}$ . The effect is significantly negative in a statistical sense when  $\ln\text{HLS}_{ijt}$  is about 2.75 or above. In other words, about two-thirds of observations are in the region of significance. Moreover, the effect never turns positively significant.

Finally, as a robustness check, models (M3\_GMM) and (M5\_GMM) show results for  $\ln\text{Eplov}_{it}$ ,  $\ln\text{HLS}_{ijt}$  and  $I_{ijt}$  entering contemporaneously into matrices  $X_{it}$  and  $Z_{ijt}$ , respectively. Endogeneity is mitigated by using two-years and higher lagged values of these variables as instruments within an Arellano-Bond-type First Difference estimator. Moreover, the appendix to the paper contains a Figure A1 which is similar to Figure 1 but based on model

<sup>13</sup> Even the CEECs included in our sample are among the highest developed transition countries.

<sup>14</sup> Calculated according to Equation 2 as  $1.22 - 0.58 * 2.95$ .

(M5\_GMM). Models (M3\_GMM) and (M5\_GMM) as well as Figure A1 imply that our results remain qualitatively unchanged.<sup>15</sup> Thus, taken together our results suggest that a high value of  $Eplov_{it}$  deters FDI in general and in industries with high shares of low-skilled workers employed in particular.

Table 6: Results for  $Eplov_{it}$

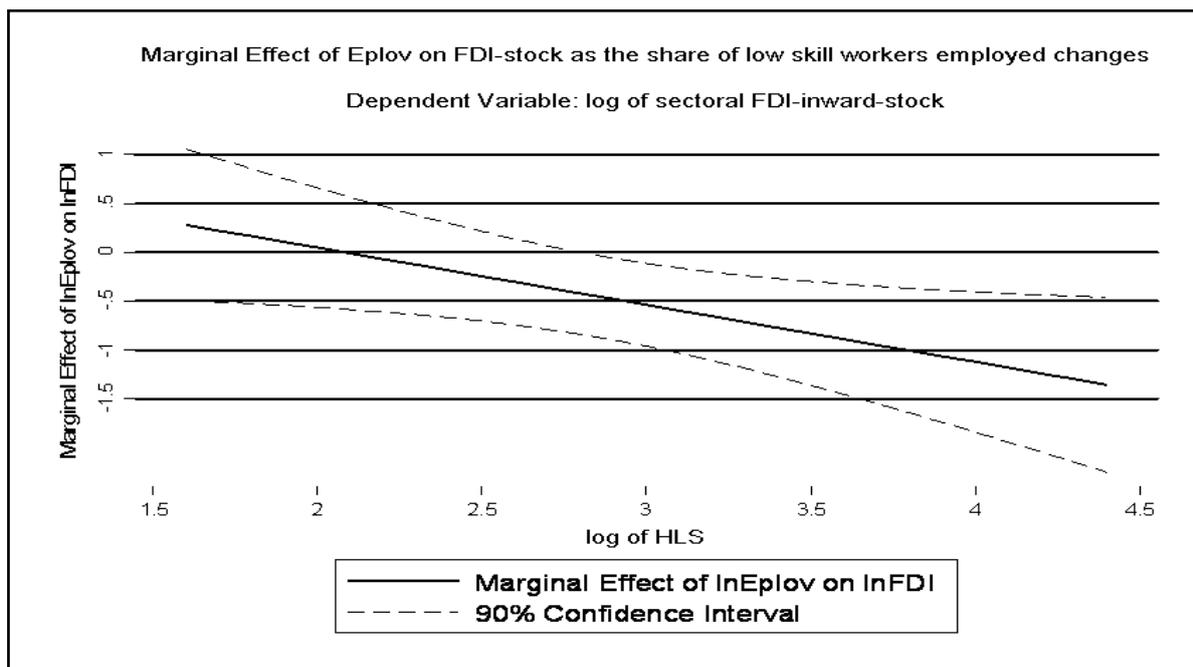
	M1	M2	M3	M4	M5	M3_GMM	M5_GMM
lnPot	1.21*	1.77***	1.15*	1.49**	1.49**	0.60*	0.97***
	(1.44)	(2.16)	(1.38)	(1.67)	(1.71)	(1.59)	(2.47)
lnGdpcap	1.74**	not included	1.82***	1.79**	1.79***	1.52**	1.82***
	(1.88)		(2.11)	(1.95)	(2.08)	(1.84)	(2.09)
lnIct	0.71**	0.96***	0.76**	0.63**	0.66*	0.63***	0.54***
	(1.80)	(2.65)	(1.88)	(1.72)	(1.61)	(2.50)	(2.34)
lnEatr	-1.15***	-0.89***	-1.14***	-1.25***	-1.25***	-0.67**	-0.92***
	(-2.90)	(-2.47)	(-3.10)	(-3.17)	(-3.20)	(-2.37)	(-3.48)
lnLabcost	-1.31*	-1.55**	-1.21*	-1.27*	-1.22*	-0.41*	-0.57**
	(-1.55)	(-1.78)	(-1.45)	(-1.48)	(-1.45)	(-1.56)	(-1.93)
lnGovgerd	0.48***	0.35*	0.49**	0.48***	0.47***	0.26*	0.28*
	(2.04)	(1.49)	(1.95)	(2.01)	(2.06)	(1.49)	(1.52)
lnHLS	-0.48*	-0.50*	-0.47*	-0.26	-0.24	-0.80*	-0.31
	(-1.50)	(-1.54)	(-1.55)	(-0.75)	(-0.74)	(-1.55)	(-0.64)
lnEplov	-0.48**	-0.41*	-0.49**	1.12	1.22	-1.32***	-0.37
	(-1.71)	(-1.49)	(-1.79)	(1.20)	(1.44)	(-3.42)	(0.32)
lnRisk	0.13	0.62	ns	0.03	ns	ns	ns
	(0.23)	(1.04)		(0.05)			
lnFreefdi	0.15	0.10	ns	0.15	ns	ns	ns
	(0.69)	(0.46)		(0.74)			
lnLabprod	0.002	0.05	ns	-0.01	ns	ns	ns
	(0.01)	(0.25)		(-0.06)			
lnCpi	-0.044	-0.03	ns	-0.03	ns	ns	ns
	(-1.03)	(-0.81)		(-0.71)			
I (interaction term)	not included	not included	not included	-0.55**	-0.58***	not included	-0.25
				(-1.78)	(-2.03)		(-0.66)
Obs	1006	1006	1016	1006	1016	898	898

<sup>15</sup> Estimations are carried out using Stata 10.1. GMM estimation is based on Rodman's (2009) xtabond2 command.

Cluster	108	108	108	108	108	108	108
R <sup>2</sup> overall	0.62	0.61	0.63	0.62	0.62		
TD (p-value)	0.004	0.021	0.001	0.002	0.001	0.001	0.003
F-test (p-value)				0.048	0.033		0.001
HT (p-value)			0.000				
OV (p-value)						0.113	0.549
Number of IV						67	116
AR(2) (p-value)						0.141	0.116
AR(1) (p-value)						0.010	0.006

Notes: For convenience time, country and industry identifier not included; t-values based on bootstrapped standard errors in parenthesis except in case of GMM models; in these cases z-statistics are based on robust one-step GMM standard errors; ns = not significant and therefore excluded; TD = Test on joint significance of time dummies; F-test is test on joint significance of  $\ln\text{Eplov}_{it}$  and  $I_{ijt}$  (interaction term); in case of model (M3) HT is for the bootstrapped Hausman-test for Random vs. Fixed Effects (see Cameron and Trivedi 2009, p. 429f); OV = Hansen-J-test on validity of instruments; AR() = Arellano-Bond-test for serial correlation; \*\*\* / \*\* / \* = significant (one-sided test) at the 1% / 5% / 10% significance level.

Figure 1: Impact of  $\text{Eplov}_{it}$  on FDI as  $\text{HLS}_{ijt}$  changes



Source: Based on Stata code made available by Thomas Brambor:  
<http://homepages.nyu.edu/~mrg217/interaction.html#code>

As  $\text{Eplov}_{it}$  is a summary index it might hide structural differences, which are revealed by the underlying sub-indices,  $\text{Eplreg}_{it}$  and  $\text{Epltemp}_{it}$ . Table 7 includes the results.

Again starting with the model excluding the interaction effect (M6 as the preferred model), the coefficient on  $\text{Eplreg}_{it}$  is statistically significant and also carries a negative sign like

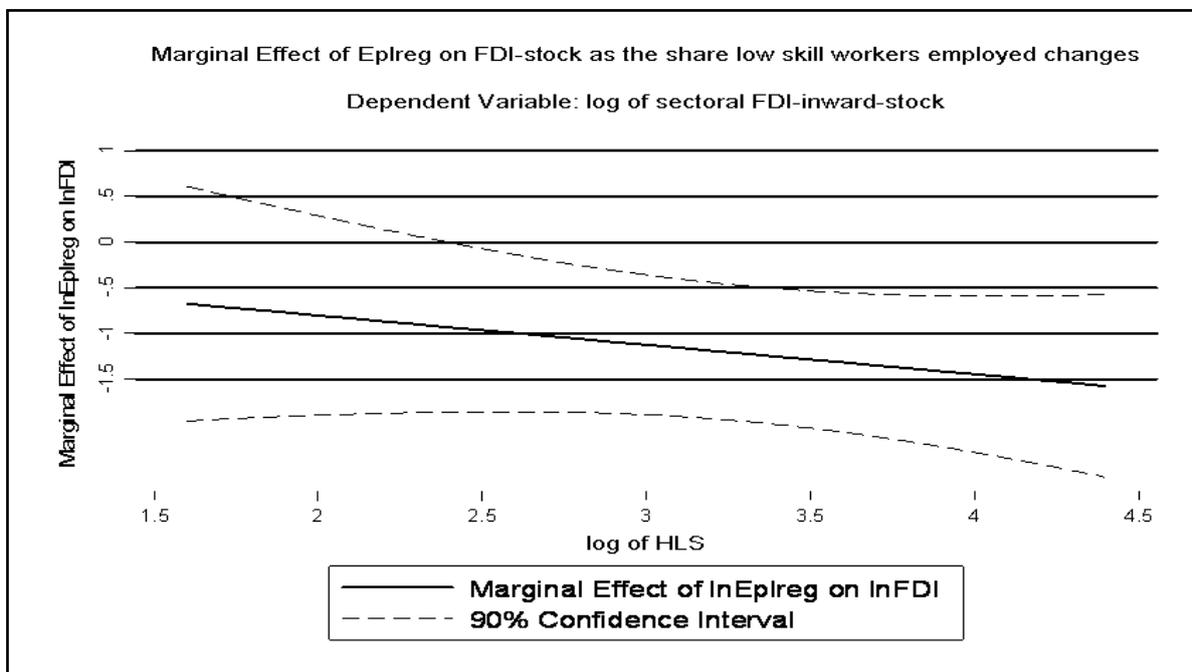
$Eplv_{it}$ , but implying a substantially higher elasticity. Thus, strict regulations towards regular employment have a significant direct effect on inward FDI.

Model (M7) in Table 7 shows the preferred specification with the interaction term included. Although none of the three coefficients of main interest is statistically significant this does not imply that no economically and statistically significant effect exists (cf. Figure 2) as outlined above and detailed in Brambor et al. (2006). Moreover,  $\ln Eplreg_{it}$  and  $I_{ijt}$  are jointly statistically different from zero.

The marginal effect of  $\ln Eplreg_{it}$  evaluated at the mean value of  $\ln HLS_{ijt}$  is  $-1.11$ .<sup>16</sup> Thus, evaluated at the mean value of  $\ln HLS_{ijt}$  the effect of  $Eplreg_{it}$  is larger than that of  $Eplv_{it}$ .

Turning to size and significance of the marginal effect of  $\ln Eplreg_{it}$  over different values of  $\ln HLS_{ijt}$ , Figure 2 clearly shows that – similar to  $Eplv_{it}$  – the marginal effect of  $\ln Eplreg_{it}$  is significant and negative for the majority of the sample values of  $\ln HLS_{ijt}$ . Only 16% of observations are outside the region of significance and the elasticity never turns significantly positive.

Figure 2: Impact of  $Eplreg_{it}$  as  $HLS_{ijt}$  changes



<sup>16</sup> Calculated according to Equation 2 as  $-0.16 + (-0.32 \cdot 2.95)$ .

The third indicator of  $Epl_{it}$  used in the analysis is  $Epltemp_{it}$ . In marked contrast to the previous results, the coefficient on  $\ln Epltemp_{it}$  is statistically not significant and has a substantially lower elasticity close to zero. Thus, regulations towards temporary employment seem not to have any impact on FDI. This result is in line with Gross and Ryan (2008) who conclude that although the protection of regular employment exerts a harmful effect on FDI, regulation with respect to temporary employment has a much weaker impact. More importantly, this result is not unexpected as the share of temporary employment in total employment remains below 15% in the countries in our sample (ILO 2008). Thus, the majority of labor contracts are on a regular basis.<sup>17</sup> This is consistent with the finding of a larger effect of  $Eplreg_{it}$  than  $Epltemp_{it}$  on FDI.

Table 7: Results for  $Eplreg_{it}$  and  $Epltemp_{it}$

	M6	M7	M8
	$Eplreg_{it}$	$Eplreg_{it}$	$Epltemp_{it}$
$\ln Pot$	1.22*	1.33**	1.07*
	(1.45)	(1.56)	(1.28)
$\ln Gdpcap$	1.75***	1.64**	1.82***
	(2.06)	(1.92)	(2.05)
$\ln Ict$	0.68**	0.62*	0.79**
	(1.67)	(1.52)	(1.92)
$\ln Eatr$	-1.37***	-1.37***	-1.18***
	(-3.48)	(-3.48)	(-3.20)
$\ln Labcost$	-1.33*	-1.31*	-1.21*
	(-1.60)	(-1.55)	(-1.43)
$\ln Govgerd$	0.48***	0.47***	0.42**
	(2.08)	(2.03)	(1.84)
$\ln Hls$	-0.48*	-0.25	-0.42*
	(-1.56)	(-0.70)	(-1.35)
$\ln Eplreg / \ln Epltemp$	-1.24***	-0.16	-0.07
	(-2.86)	(-0.14)	(-0.63)
I (interaction term)	not included	-0.32	not included
		(-0.97)	
Obs	1016	1016	1016
Cluster	108	108	108

<sup>17</sup> According to ILO (2008) the incidence of temporary employment has tended to increase since the 1990ies, yet only marginally so in CEECs.

R <sup>2</sup> overall	0.59	0.61	0.60
TD (p-value)	0.001	0.001	0.001
F-test (p-value)		0.015	
HT (p-value)	0.000		0.000

Notes: For convenience time, country and industry identifier not included; t-values based on bootstrapped standard errors in parenthesis; TD = Test on joint significance of time dummies; F-test is test on joint significance of  $Eplreg_{it}$  and  $I_{ijt}$  (interaction term); HT = bootstrapped Hausman-test for Random vs. Fixed Effects; \*\*\* / \*\* / \* = significant (one-sided test) at the 1% / 5% / 10% significance level.

## V. CONCLUSIONS

Summarizing, for a country's overall regulations towards employment protection and for regulations towards regular employment the results confirm our expectations: the rigidity of labor markets matters for inward FDI-stock and the deterrent effect is larger in industries with high shares of low-skilled workers employed. Yet, for regulations towards temporary employment no impact on FDI is established. This is, however, not implausible given the arguments in the related empirical literature discussed above and the descriptive evidence presented.

Our findings suggest that governments can support structural change by tightening of labor market regulations. Such policies may lead to a change in the composition of manufacturing activities by deterring FDI into low-skill intensive sectors. Host country governments should simultaneously improve those location factors which are especially relevant for high-skill FDI (e.g. the economy's R&D intensity which is shown to have a positive impact on FDI). This has the potential to compensate investors into high-skill industries for higher labor-related costs and thus to stabilize the level of FDI into these sectors. Indeed, such policies have been used by several Asian countries (e.g. China, Taiwan, Singapore, Malaysia, South Korea) in order to climb up the ladder of production and product technologies (see e.g. Asian Development Bank 2004).

Finally, let us point out two aspects: First, one should bear in mind that the proxies for the degree of employment protection legislation used in this and earlier studies are often based on legal constraints that apply in host countries of FDI. Thus, they may not fully capture the degree of enforcement of employment protection across countries and over time. This is especially relevant in samples of heterogeneous countries as strict enforcement of labor laws needs well functioning labor tribunals. For example, in the CEECs the enforcement of

employment protection legislation is weak due to the limited capacities of the courts and labor inspectorates (see Leibrecht and Scharler, 2009).

Secondly, as most industries have segments of low- and high-skill activities, the sector view may be too broad (see Snower et al. 2009, p. 142) for analyzing the current issue. Yet, it is hoped that once more detailed micro-data become available, future research will be able to address this problem more thoroughly.

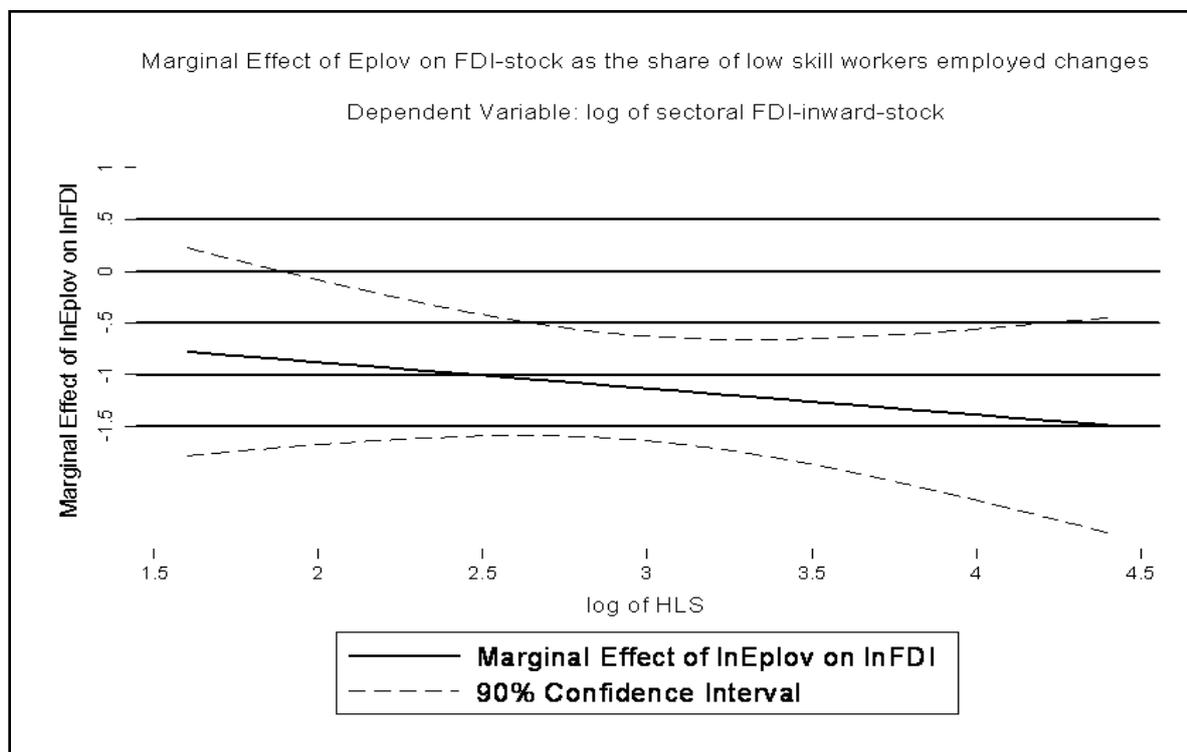
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## Appendix

Figure A1: Impact of  $\text{Eplov}_{it}$  on FDI as  $\text{HLS}_{ijt}$  changes based on model M5\_GMM

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Due to geographic proximity and sizable Puerto Rican communities already present in the state, Florida has become a primary destination for in-migrants from Puerto Rico in recent years. Following a brief exposition of decennial census counts for 2000 and 2010, this article examines various aspects of Puerto Rican population growth in Florida – as well as for some other states – focusing especially on migration patterns; we also discuss some county-level patterns. The primary data source we use in this article includes 1-year estimates from the American Community Survey (ACS) from 2005 to 2016 as well as data from the 1-year Public Use Microdata Sample (PUMS) files of the ACS for those years. We close with comments about recent inflows from Puerto Rico to Florida following Hurricane Maria.

**Table 1. Puerto Rican Population in the United States, Puerto Rico, and the Top Five States**

	Puerto Rican Population				Numeric Change		Percentage Change	
	Census		ACS 1-year		Census	ACS	Census	ACS
	2000	2010	2010	2016	2000-10	2010-16	2000-10	2010-16
United States	3,406,178	4,623,716	4,691,890	5,450,472	1,217,538	758,582	35.7	16.2
Puerto Rico	3,623,392	3,554,642	3,560,838	3,263,755	-68,750	-297,083	-1.9	-8.3
New York	1,050,293	1,070,558	1,085,307	1,081,110	20,265	-4,197	1.9	-0.4
Florida	482,027	847,550	864,577	1,067,747	365,523	203,170	75.8	23.5
New Jersey	366,788	434,092	430,863	470,143	67,304	39,280	18.3	9.1
Pennsylvania	228,557	366,082	378,312	444,263	137,525	65,951	60.2	17.4
Massachusetts	199,207	266,125	262,804	319,042	66,918	56,238	33.6	21.4

	Share of Total Population (in %)				Share of Hispanic Population (in %)			
	Census		ACS 1-year		Census		ACS 1-year	
	2000	2010	2010	2016	2000	2010	2010	2016
United States	1.2	1.5	1.5	1.7	9.6	9.2	9.2	9.5
Puerto Rico	95.1	95.4	95.7	95.7	96.3	96.4	96.8	97.0
New York	5.5	5.5	5.6	5.5	36.6	31.3	31.6	28.8
Florida	3.0	4.5	4.6	5.2	18.0	20.1	20.3	20.8
New Jersey	4.4	4.9	4.9	5.3	32.8	27.9	27.5	26.3
Pennsylvania	1.9	2.9	3.0	3.5	58.0	50.9	52.4	49.4
Massachusetts	3.1	4.1	4.0	4.7	46.5	42.4	41.6	40.9

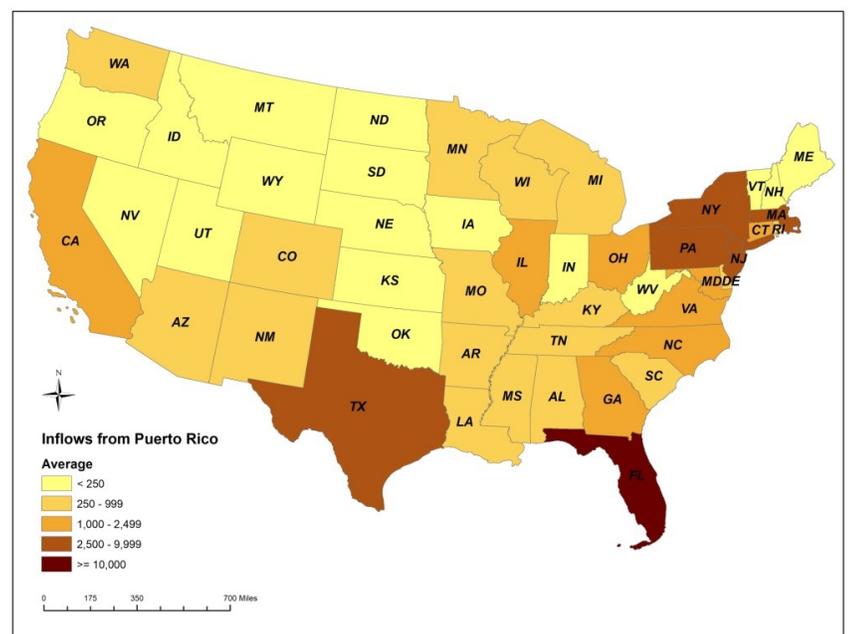
Table 1 shows that the number of Puerto Ricans living in the United State has increased by about 1.2 million (36%) between 2000 and 2010, while it decreased slightly in Puerto Rico. For comparison, Table 1 also displays the 1-year ACS estimates for 2010; while not identical, the 2010 1-year ACS estimates are generally quite close to the 2010 decennial census counts. For the United States, the 2000–2010 trend continued in 2010–2016, with the Puerto Rican population growing by another 750,000 (16%). The population declines accelerated in Puerto Rico, with the island’s population shrinking by about 300,000 (8%) since 2010. Among states, New York still has the largest resident population of Puerto Ricans, but it has hardly changed since 2000. In contrast, the Puerto Rican population living in Florida has grown rapidly since 2000, increasing by about 365,000 (76%) from 2000 to 2010, and by another 200,000 (24%) from 2010 to 2016. Other states with sizeable Puerto Rican populations include New Jersey, Pennsylvania, and Massachusetts; in all three states the Puerto Rican population increased more rapidly than in New York, though not as fast as in Florida. By 2016, about 3.38 million Puerto Ricans lived in the top 5 states, representing about 62% of all Puerto Ricans living on the U.S. mainland (the lower 48 states), Alaska, and Hawaii.

The bottom panel of Table 1 shows the shares of the Puerto Rican population of total population and of the Hispanic population. Between 2000 and 2016, the Puerto Rican share of total population increased for the nation overall as well as in Florida, Massachusetts, New Jersey, and Pennsylvania; it showed little change in New York. The Puerto Rican share of the Hispanic population increased only in Florida; it stayed about the same nationwide, and decreased in the other four states. The decreasing shares of Puerto Ricans among all Hispanics in New York, New Jersey, Pennsylvania, and Massachusetts mean that other Hispanic origin groups grew comparatively faster than the Puerto Rican population in those states.

### Inflows from Puerto Rico

We next examine the migration destinations of Puerto Ricans who moved to the United States mainland between 2005 and 2016. Figure 1 displays the average annual flows from Puerto Rico to each state over that period and gives us a picture of the geographic dispersal of the Puerto Rican migrants. Florida attracted the largest inflow from Puerto Rico. Other states with large inflows include several Northeastern states (New York, New Jersey, Pennsylvania, and Massachusetts), and Texas. In general, states east of the Mississippi recorded larger inflows than those in the western U.S., reflecting geographic proximity and earlier settlement patterns of the Puerto Rican population stateside.

**Figure 1. Average Annual Inflows from Puerto Rico to the Continental United States, 2005–2016**



As shown in Table 2, Florida's share (29%) of the total inflow from Puerto Rico to the United States between 2005 and 2016 far exceeded that of any other state. In fact, Florida's share was almost as large as the combined inflows to New York, Pennsylvania, Texas, and Massachusetts. New York still has the largest population of Puerto Ricans on the mainland (see Table 1). However, because of the much faster growth of the Puerto Rican population living in Florida, as well as that of several other states, New York's share of Puerto Ricans living in the United States has been declining over time, from about 31% in 2000 to 20% by 2016 (data not shown). Given these trends, it is possible that the 2017 ACS 1-year estimates, which are scheduled to be released in the fall of 2018, will show that Florida has become the state with the largest Puerto Rican population living on the mainland (see also the discussion about Hurricane Maria below).

**Table 2. The Top 10 Destination States for Migrants from Puerto Rico to the United States, 2005–2016**

Rank	State	Total Inflow	Share (in %)
1	Florida	242,134	29.0
2	New York	79,985	9.6
3	Pennsylvania	68,727	8.2
4	Texas	58,723	7.0
5	Massachusetts	50,231	6.0
6	New Jersey	44,360	5.3
7	Connecticut	29,809	3.6
8	Ohio	23,639	2.8
9	Georgia	22,438	2.7
10	California	20,555	2.5

Next, we focus in more detail on the migration flows from Puerto Rico to Florida. Figure 2 depicts the annual inflows from Puerto Rico to Florida between 2005 and 2016; these ranged from about 11,400 in 2005 to 24,000 in 2016, peaking at just over 31,000 in 2014. Although the 1-year ACS estimates fluctuate from year to year, the overall trend is upwards. In addition, the figure shows Florida's share of total inflows to the United States from Puerto Rico; it ranged from 24% (in 2010) to 36% (in 2014) over the period.

Figure 2. Annual Inflows from Puerto Rico to Florida, 2005–2016

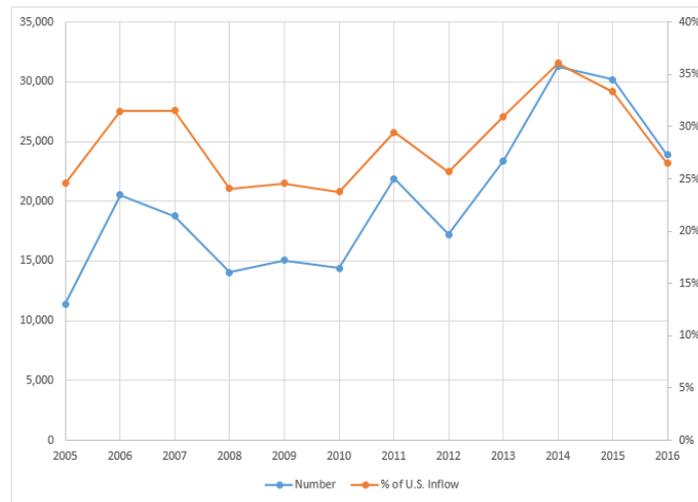


Figure 3 makes clear that migrants from Puerto Rico predominantly settled in Central and South Florida; the majority of counties in North Florida, in contrast, received fewer than 100 migrants on average per year. In fact, more than two thirds of all migrants from Puerto Rico to Florida moved to Central Florida, followed by South Florida (about 20%). Puerto Ricans are attracted to Central Florida due to the large population of Puerto Ricans already living in the area; the education system, job opportunities, and relatively inexpensive housing are further attractors. Orange County recorded the largest inflow of Puerto Ricans of all Florida counties between 2005 and 2016, as shown in Figure 3 and Table 3, followed by Osceola and Hillsborough counties. Rounding out the top five are Miami–Dade and Broward counties in South Florida.

Figure 3. Average Annual Inflows from Puerto Rico to Florida Counties, 2005–2016

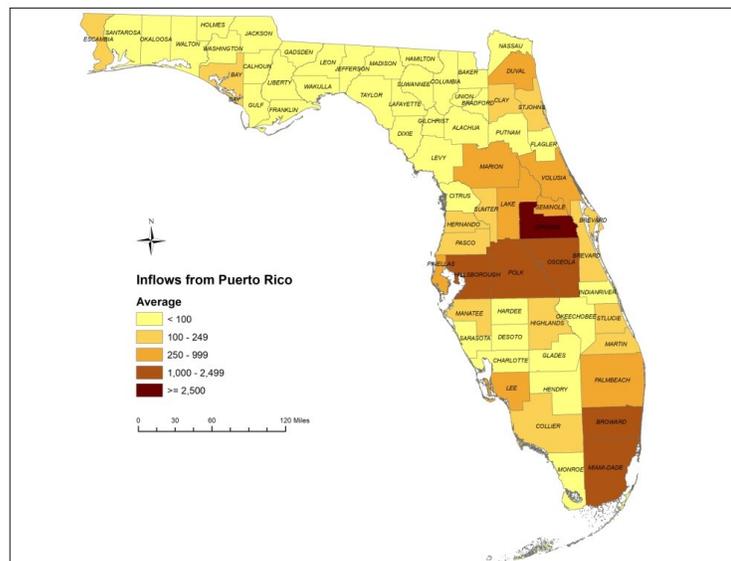


Table 3. The Top 10 Destination Counties for Total Inflows from Puerto Rico to Florida, 2005–2016

Rank	County	Total Inflow	Share (in %)
1	Orange	61,819	25.5
2	Osceola	29,949	12.4
3	Hillsborough	23,739	9.8
4	Miami-Dade	19,876	8.2
5	Broward	15,040	6.2
6	Polk	12,528	5.2
7	Volusia	9,151	3.8
8	Palm Beach	8,616	3.6
9	Pinellas	6,634	2.7
10	Seminole	6,329	2.6

Turning from Florida to the nation, Table 4 displays the 15 counties in the United States with the largest populations of Puerto Rican residents. Since the 1-year ACS estimates can fluctuate from year-to-year, we averaged three years of data to provide more stable results. We note that these are not identical to the 3-year ACS estimates, which have been discontinued in 2013. Table 4 shows estimates for 2005 to 2007 and 2014 to 2016; these represent the earliest and the most recent ACS data available. At the beginning of the period, four of the five boroughs of New York City – the Bronx, Brooklyn (Kings County), Manhattan (New York County), and Queens – were in top six; Cook County, Illinois, and Orange County, Florida were ranked third and fourth. By 2014–2016, while the Bronx remained in first place, Manhattan had dropped four spots to ninth, and Brooklyn fell from second to third rank. The Bronx, Brooklyn, and Manhattan recorded population decreases between 10% and 17% over the period, totaling a net loss of over 90,000 persons of Puerto Rican origin, while Queens recorded only a very slight increase. Chicago (Cook County, IL), which had the third largest Puerto Rican population in 2005–2007, also saw little growth over the period. In contrast, the largest numeric and percentage increases were in Florida: The Puerto Rican populations in Orange, Hillsborough, and Osceola counties grew between 50% and 78% over the period, and these three counties moved up between 2 and 4 spots in the ranking. Increases between 34% and 40% were recorded in the Connecticut River Valley (Hampden County, MA; Hartford County, CT; and New Haven County, CT), followed by Philadelphia (+28%). Growth was comparatively slower in South Florida, with Broward and Miami-Dade counties recording increases between 15% and 24%; both counties dropped in the ranking.

**Table 4. The Top 15 Counties for Puerto Rican Residents in the United States**

County	Population		Rank			Population Change	
	2005–07	2014–16	2005–07	2014–16	Change	Percentage	Numeric
Bronx, NY	317,734	272,850	1	1	0	-14.1	-44,885
Orange, FL	120,374	183,834	4	2	2	52.7	63,460
Kings, NY	200,975	166,628	2	3	-1	-17.1	-34,347
Cook, IL	132,732	141,742	3	4	-1	6.8	9,010
Philadelphia, PA	104,662	133,949	7	5	2	28.0	29,286
Queens, NY	111,872	115,505	6	6	0	3.2	3,633
Hartford, CT	81,663	112,925	9	7	2	38.3	31,262
Hillsborough, FL	70,991	106,892	10	8	2	50.6	35,901
New York, NY	116,356	105,168	5	9	-4	-9.6	-11,188
Osceola, FL	57,270	102,184	14	10	4	78.4	44,914
Miami-Dade, FL	87,899	101,263	8	11	-3	15.2	13,364
Hampden, MA	68,686	95,930	12	12	0	39.7	27,244
Broward, FL	70,419	87,562	11	13	-2	24.3	17,143
New Haven, CT	64,590	86,657	13	14	-1	34.2	22,067
Suffolk, NY	54,144	64,780	15	15	0	19.6	10,636

## Migration Flows from Puerto Rico vs. from Other States

Inflows from Puerto Rico account for only part of the growth of the Puerto Rican population in Florida and other states. Puerto Ricans also move between states, and the population changes through natural increase<sup>[1]</sup> as well. Figure 4 compares the annual inflows from Puerto Rico to Florida to the migration flows of Puerto Ricans moving from other states to Florida during 2005–2016<sup>[2]</sup>. Interestingly, in all years but 2014 and 2015, there were more Puerto Ricans moving from other states to Florida than moving from the island itself. However, migration from Puerto Rico has increased over the period while the migration of Puerto Ricans from other states has been relatively flat. Furthermore, migration flows of Puerto Ricans from Florida to other states also exceeded flows from Florida to Puerto Rico over that period, making the net exchange more balanced (data not shown).

**Figure 4. Annual Inflows of Puerto Ricans to Florida, Puerto Rico vs. Other States, 2005–2016**

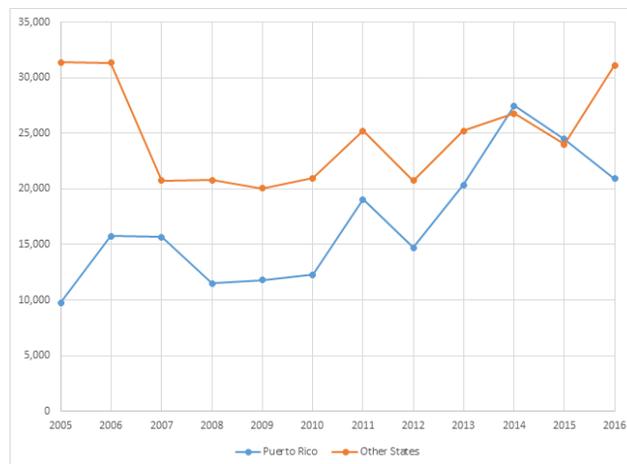


Table 5 displays Florida’s cumulative in-, out-, and net migration flows of Puerto Ricans with the nine states that recorded the largest inflows from Puerto Rico from 2005 to 2016; also shown are the total exchanges with all other states. Over the twelve year period, about 300,000 Puerto Ricans moved from other states to Florida, about 200,000 moved from Florida to other states, resulting in a net gain of about 100,000 Puerto Rican residents. The most lopsided exchanges were with New York and New

Jersey; inflows of Puerto Ricans from these two states to Florida exceeded outflows by about 150% and 235%, respectively. Over the period, about 53,400 more Puerto Ricans moved from New York to Florida than moved in the other direction; other sizable net gains were recorded with New Jersey (+19,300) and Pennsylvania (+11,000). Florida had positive net migration flows with only four of these nine states, as more Puerto Ricans moved from Florida to Texas, Massachusetts, Ohio, Georgia, and California than vice versa. However, except for Texas (-5,300), Florida's net migration losses to these states were quite small.

**Table 5. In-, Out-, and Net Migration of Puerto Ricans between Florida and Other States, 2005–2016**

State	In	Out	Net
New York	88,495	35,069	53,426
Pennsylvania	25,622	14,658	10,964
Texas	12,395	17,718	-5,323
Massachusetts	11,470	11,931	-461
New Jersey	27,455	8,184	19,271
Connecticut	17,594	12,365	5,229
Ohio	3,810	4,228	-418
Georgia	11,743	11,871	-128
California	7,661	8,559	-898
All Other States	298,380	198,968	99,412

### The Impact of Hurricane Maria

The Puerto Rican population in Florida has grown substantially since 2000, especially in Central Florida. The devastation brought about by Hurricane Maria that struck Puerto Rico and the U.S. Virgin Islands in late September of 2017 has raised questions about the demographic impacts on Florida. Since early October, large numbers of residents have been reported leaving Puerto Rico and moving to the U.S. mainland, with Florida being a prime destination. Data on actual flows, however, are still quite sparse, and estimates of the overall size of the flow – both current and for the near future – vary widely. Flight arrival data provide some information, but have historically overstated actual migration flows by wide margins. This is because most air passengers are not

migrants, but tourists, people traveling for business, those visiting family and friends, etc. It is likely that the proportion of migrants from Puerto Rico among air arrivals has been much higher after Hurricane Maria than was true in the past, but we don't yet know by how much.

The most recent Demographic Estimating Conference held December 5, 2017, in Tallahassee, FL, estimated about 53,000 Puerto Ricans and U.S. Virgin Islanders moving to Florida permanently in response to the impacts of Hurricane Maria.<sup>[3]</sup> This estimate was based on counts of Puerto Ricans that have visited Multi-Agency Resource Centers at Orlando International Airport, Miami International Airport, and the Port of Miami through the end of November 2017; flight arrivals and school enrollment data were also considered when making this estimate. It is a reasonable estimate, given the available information at the time, but the eventual number could turn out quite differently. To us, this estimate seems somewhat conservative; we note, however, that some of the higher estimates that have circulated in the news appear to be highly speculative given the available data. This is a good reminder that estimates, like the ACS PUMS data used in this article, include margins of error. However, they are still valuable when done with care, for they do provide information. While we don't yet know how many Puerto Ricans will ultimately decide to leave the island as a response to Hurricane Maria, a not inconsequential demographic impact on Florida seems likely, especially for the greater Orlando area.

# How do Firing Costs Affect Worker Flows in a World with Adverse Selection?\*

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## Abstract

This paper provides a theoretical and empirical analysis of a firing costs model with adverse selection. In a heterogeneous world, firms decide who to fire, so low-quality workers are more likely to be dismissed. Our theory suggests that as firing costs increase, firms may increasingly prefer to hire out of the pool of the employed, since the employed are less likely to be lemons. Estimates of re-employment and job-transition probabilities from the NLSY support this prediction. Unjust-dismissal provisions in U.S. states reduce the re-employment probabilities of unemployed workers but have little effect on job-transition rates for the employed. Consistent with a lemons story, the relative effects of unjust-dismissal provisions on the unemployed are generally smaller for union workers, who are subject to layoff-by-seniority rules, and for those who lost their previous jobs due the end of a contract.

**Keywords:** Adverse Selection, Dismissal Costs, Unemployment, Worker Flows, Matching Models, Discrimination.

**Journal of Economic Literature Classification Codes:** E24, J41, J63, J64, J65, J71.

# 1 Introduction

Job security regulations are widely believed to reduce firing and hiring. Reduced dismissal rates benefit employed workers, but reduced hiring rates hurt both the unemployed and those employed workers who would like to change jobs. The purpose of this paper is to present and test a theory which suggests that the reduction in hiring caused by firing costs can affect different groups of workers very differently. We show that the reduction in hiring is likely to be more severe for the unemployed than the employed. In a world with adverse selection, firing costs not only lengthen jobless-spells, they may also redistribute new employment opportunities from unemployed to employed workers.

The principal theoretical innovation in our paper is the introduction of adverse selection in a model of firing costs. A standard result in theoretical discussions of firing costs is that hiring and firing rates both fall when workers are protected (see, e.g., Bentolila and Bertola (1990) and Hopenhayn and Rogerson (1993)). Re-employment probabilities in models of adverse selection vary according to the type of separation (Gibbons and Katz (1991)). Our setup combines these features: worker quality is imperfectly observed, so firms must contend with the possibility of hiring a ‘lemon’ in addition to the possible expense of dismissal. When faced with an adverse shock, firms prefer dismissing bad workers who generate lower profits. As a result, in equilibrium, employed workers are more productive than the unemployed. Thus, firms concerned about firing costs will generally find it worthwhile to recruit new workers primarily from the pool of those already employed.

The central theoretical prediction of our model is that an increase in firing costs typically increases discrimination against unemployed job seekers. To test this model, we look at the effect of state unjust-dismissal provisions on the re-employment and job-transition probabilities of unemployed and employed workers using the NLSY. These data are useful for this purpose for three reasons. First, the NLSY allows us to identify job-to-job transitions. Second, we can identify employed and unemployed job seekers. Finally, the NLSY’s Geocode file allows us to identify workers covered by unjust-dismissal provisions.

Our results show reduced re-employment probabilities for the unemployed but not for employed workers over the 1980’s in states that introduced unjust-dismissal provisions. The results are unchanged when controlling for state and time effects, for time-specific and state-specific effects on the unem-

ployed, for interactions between region and time effects, for unemployment benefit receipt, for differential welfare benefits across states, and for differential effects of other variables on unemployed and employed workers. Finally, we check if the relative effect on the unemployed is greater for nonunionized than unionized workers, since unionized jobs are covered by layoff-by-seniority rules, and for dismissed workers than for workers who are unemployed because of the end of a contract. As the lemons story suggests, our empirical findings generally confirm greater effects on nonunionized than unionized workers and on dismissed workers than on end-of-contract workers.

As indicated above, our paper relates to the literatures on adverse selection and firing costs. We extend the influential work on adverse selection of Gibbons and Katz (1991) by including firing costs. More recent asymmetric information models also appear in papers by Montgomery (1999), Canziani and Petrongolo (2001), and Strand (2000). In contrast to our paper, these papers only consider re-employment transitions for the unemployed and not for employed workers.

This paper also relates to the extensive literature that examines the link between firing costs and labor market performance. In contrast to firing costs models without adverse selection, our model predicts a shift in hiring from unemployed to employed workers. Moreover, our work relates to the extensive empirical literature on the impact of firing costs using macro- and micro-data.<sup>1</sup> Our paper shares the methodology with papers using micro-data and the state variation in unjust-dismissal provisions exploited by Autor (2000), Dertouzos and Karoly (1992), Hamermesh (1993), and Miles (2000). Finally, we contribute to the literature contrasting job search outcomes for employed and unemployed workers (e.g., Holzer,1988; Blau and Robbins,1990).

The paper is organized as follows. Section 2 presents and solves the matching model with asymmetric information and on-the-job search. Section 3 extends this model to allow for endogenous meeting rates. In Section 4, we describe the data and present estimates of the effect of dismissal costs on re-employment and job-transition probabilities of unemployed and employed workers. We conclude in Section 5.

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<sup>1</sup>Studies using aggregate data include: Lazear (1990), Bertola (1990), and Di Tella and McCulloch (1999) among others. There are also a handful of studies examining the impact of firing costs using microdata.

## 2 The Model

### 2.1 Description of the Model

The theoretical framework is based on Mortensen and Pissarides (1994), where we simplify some aspects to preserve tractability but introduce dismissal costs, on-the-job search and adverse selection to capture the phenomena of interest. We show that in contrast to a world without adverse selection, firing costs not only reduce hiring and firing but they could also shift hiring from unemployed to employed workers.

The total labor force is split between two types of workers, ‘good’ and ‘bad’. The proportion of ‘good’ workers is denoted by  $z$ , where the total labor force is normalized to 1. Prior to hiring, firms do not observe the quality of applicants nor their past labor history. They only observe the applicant’s current employment status. Immediately after hiring, however, firms observe the productivity of the worker.<sup>2</sup>

Firms freely enter the market by creating vacant positions. Once the position is created, firms face a cost  $C$  of holding a vacancy. Because of free entry, the value of a vacancy must always be equal to 0 in equilibrium. A job seeker meets a vacant job with probability  $a$  per unit of time, which we take to be exogenous in this section but endogenize in the following section. When meeting a worker, a firm decides whether to hire a worker or not depending on his labor market status. Below, we only consider the case where employed job seekers are hired for sure, which must hold in any equilibrium of interest.<sup>3</sup>

Once a position is filled, production takes place. The firm’s output per unit of time is  $m + \eta$ , where  $m$  is a match-specific component and  $\eta$  is worker-specific. We assume  $\eta = \eta_H$  for good workers and  $\eta = \eta_L < \eta_H$  for bad workers. When the match is initially formed the match-specific component is equal to  $\bar{m}$ , but with probability  $\gamma$  per unit of time the firm is hit by a

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<sup>2</sup>This assumption is made for simplicity, as it reduces the number of individual states one has to keep track of. One could specify a learning process about the worker’s productivity (as in Jovanovic, 1979), but since we are not dealing with learning aspects we keep this part of the model as simple as possible.

<sup>3</sup>As it will be clear below, the pool of employed job seekers is of higher quality than that of unemployed job seekers, thus generating higher net expected profits. If firms did not hire employed applicants with probability one, then these profits would be negative or zero, implying strictly negative net expected profits out of unemployed applicants. The exit rate from unemployment would then be zero, so that the whole workforce would be unemployed in equilibrium.

shock that changes the productivity of the match. Every time such a shock occurs, the new productivity is drawn from a distribution  $G(m)$  over the interval  $[\underline{m}, \bar{m}]$ .

Wages are assumed to be equal to a base wage,  $\bar{w}$ , plus a constant fraction,  $\varphi$ , of output with worker productivity,  $\eta$ , and match productivity,  $m$ :

$$w(m, \eta) = \varphi(m + \eta) + (1 - \varphi)\bar{w}.$$

This assumption implies that firms make higher profits out of good workers than out of bad ones, which is central to our results.<sup>4</sup>

Production takes place until either the firm closes the position or the worker quits. Firms pay a tax  $F$  when dismissing a worker, which is paid to a third party. We specify firing costs as a tax because, as discussed below, a substantial fraction of firing costs go to third parties such as lawyers, insurers, and the government. In contrast, the firm does not have to pay  $F$  when the worker quits. The quit rate is endogenous and given by the probability of engaging in on-the-job search times the instantaneous probability of receiving an offer,  $a$ . Workers face a flow search cost,  $c$ , from searching on-the-job, but the benefit of searching is that they move to a match with the highest possible level of productivity. Whether the firm dismisses or the worker quits, the position is destroyed and the firm's value drops to zero.

## 2.2 Equilibrium

### 2.2.1 On-the-job Search

We first solve for on-the-job search, which is obtained by comparing the worker's value of being employed while searching and not searching. Let  $E(m, \eta, NS)$  be the value of being employed while not searching for an employed worker of productivity  $\eta$  and match-specific productivity  $m$ . The value of the employed worker who does not search is given by the following Bellman equation,

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<sup>4</sup>While this holds in a wide variety of models of wage formation (except for the perfectly competitive case, which equates wages to marginal product), the extent to which the results are affected by other assumptions about wage determination is left for future work.

$$\begin{aligned}
rE(m, \eta, NS) &= \varphi(m_{\underline{z}} + \eta) + (1 - \varphi)\bar{w} \\
&\quad + \gamma \int_{m_c}^{\bar{m}} E(m, \eta) g(m) dm + G(m_c(\eta))U(\eta) \\
&\quad - E(m, \eta, NS)], \tag{1}
\end{aligned}$$

where  $U(\eta)$  is the value of an unemployed and  $m_c$  is the critical value of the match-specific productivity that triggers a dismissal, so the last term is the expected capital gain or loss from being hit by a shock. Similarly, the value of an employed job seeker is given by the following Bellman equation,

$$\begin{aligned}
rE(m, \eta, S) &= \varphi(m_{\underline{z}} + \eta) + (1 - \varphi)\bar{w} - c + a [E(\bar{m}, \eta) - E(m, \eta, S)] \\
&\quad + \gamma \int_{m_c}^{\bar{m}} E(m, \eta) g(m) dm + G(m_c(\eta))U(\eta) \\
&\quad - E(m, \eta, S)], \tag{2}
\end{aligned}$$

where the fourth term represents the expected capital gain from quitting into a new job.

Search on-the-job for an employed with match-specific productivity,  $m$ , takes place if  $E(m, \eta, S) \geq E(m, \eta, NS)$ . Since the cost of search is constant and the benefit from searching is that the person moves from the current match to the highest possible match-specific productivity, then the gains from searching on-the-job increase as the current match level decreases. This means that on-the-job search is given up at the unique value,  $\bar{\theta}$ , below which there is always on-the-job search, and which satisfies the condition,

$$E(\bar{\theta}, \eta, S) = E(\bar{\theta}, \eta, NS).$$

Substituting (1) and (2) into the above condition, we can solve for  $\bar{\theta}$  to obtain,

$$\bar{\theta} = \bar{m} - \frac{(r + \gamma)c}{\varphi a},$$

which means that search behavior is independent of worker type. Since the case of interest is given by the case when some workers engage in search, we limit ourselves to the case when the search threshold exceeds the dismissal threshold, i.e.,  $\bar{\theta} > m_c(\eta)$ , for one or both type of workers.<sup>5</sup>

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<sup>5</sup>Sufficient conditions for the search thresholds to exceed the dismissal thresholds are given in footnote 7.

### 2.2.2 Firing and Hiring Decisions

Given that the residual value of firing the worker is zero, the firm fires the worker if  $J(m, \eta) < -F$ . The value of a job filled with an employed job seeker of productivity  $\eta$  and match-specific productivity  $m \leq \bar{m}$ ,  $J(m, \eta)$ , is given by the following Bellman equation,

$$rJ(m, \eta) = (1 - \varphi)(m + \eta - \bar{w}) - aJ(m, \eta) + \gamma \int_{m_c}^{\bar{m}} J(m, \eta)g(m)dm - G(m_c(\eta))F - J(m, \eta).$$

The second term in the RHS is the expected capital loss experienced by the firm if the worker quits, which conditional on on-the-job search happens with instantaneous probability  $a$ , and the last term is the expected capital gain or loss associated with a productivity shock. Solving for  $J(m, \eta)$  we obtain,

$$J(m, \eta) = \frac{\gamma \mathcal{J}(\eta) + (1 - \varphi)(m + \eta - \bar{w})}{(r + \gamma + a)}, \quad (3)$$

where  $\mathcal{J}(\eta) = \int_{m_c}^{\bar{m}} J(m, \eta)g(m)dm - G(m_c(\eta))F$  is the average value of the match to the firm over the current value of the shock. Similarly, the value of a job filled with an employed worker who does not search, i.e.,  $m > \bar{m}$ , is,

$$J(m, \eta) = \frac{\gamma \mathcal{J}(\eta) + (1 - \varphi)(m + \eta - \bar{w})}{(r + \gamma)}.$$

Since we consider the case in which some workers search before reaching the dismissal threshold, i.e.,  $m_c(\eta) \leq \bar{m}$ , and the dismissal threshold is given by  $J(m_c(\eta), \eta) = -F$ , we obtain the following solution for the dismissal threshold,

$$m_c(\eta) = \frac{-F(r + \gamma + a) - (1 - \varphi)\eta + (1 - \varphi)\bar{w} - \gamma \mathcal{J}(\eta)}{(1 - \varphi)}, \quad (4)$$

which defines a relationship between  $m_c(\eta)$  and  $\mathcal{J}(\eta)$ .<sup>6</sup> Substituting (3) and

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<sup>6</sup>Without on-the-job search, this relationship is given by,

$$m_c(\eta) = \frac{-F(r + \gamma) - (1 - \varphi)\eta + (1 - \varphi)\bar{w} - \gamma \mathcal{J}(\eta)}{(1 - \varphi)},$$

(4) into  $\mathcal{J}(\eta)$  provides the other relationship between these two unknowns,

$$\mathcal{J}(\eta) = \frac{\int_{\bar{m}}^{\infty} \frac{(1-\varphi)(m+\eta-\bar{w})}{(r+\gamma)} g(m) dm + \int_{m_c}^{\infty} \frac{(1-\varphi)(m+\eta-\bar{w})}{(r+\gamma+a)} g(m) dm - FG(m_c(\eta))}{1 - \frac{\gamma}{(r+\gamma)} [G(\bar{m}) - G(\bar{w})] - \frac{\gamma}{(r+\gamma+a)} [G(\bar{w}) - G(m_c(\eta))]},$$

and substituting this equation into (4) determines  $m_c(\eta)$  uniquely.

Furthermore,  $m_c$  is falling with  $\eta$ , falling with  $F$ , and increasing with  $\bar{w}$ . This means that  $m_c(\eta_L) > m_c(\eta_H)$ , so that we may have two cases with on-the-job search: (a) only some workers search, i.e.,  $m_c(\eta_L) > \bar{w} \geq m_c(\eta_H)$ , in which case only good workers search, or (b) both types of workers search, i.e.,  $\bar{w} \geq m_c(\eta_L) > m_c(\eta_H)$ . We consider the second case which is the least restrictive one, although our results below are strengthened under the first case.<sup>7</sup> Moreover, the dismissal threshold of good workers is more responsive to changes in  $F$  and  $\bar{w}$  than the dismissal threshold of bad workers. Consequently,  $\frac{dm_c(\eta_L)}{dF} < \frac{dm_c(\eta_H)}{dF}$  and  $\frac{dm_c(\eta_L)}{d\bar{w}} < \frac{dm_c(\eta_H)}{d\bar{w}}$ , which is due to a discount effect since good workers are less likely to be fired (see the Appendix for proof).

We now compute the hiring decision of a firm faced with an applicant. The quality of the applicant is unobservable, but his status is observable and provides a signal to the firm. Let  $z_e$ , respectively  $z_u$ , be the proportion of good workers among employed, respectively unemployed, job seekers. Then,

indicating that on-the-job search lowers the dismissal threshold. As in Saint-Paul (1995), firms faced with firing costs may prefer to use attrition and wait until workers quit rather than dismiss at a cost,  $F$ .

<sup>7</sup>The condition for both types of workers to engage in on-the-job search before reaching the dismissal threshold is given by,

$$\bar{m} > \frac{-F(r+\gamma+a) - (1-\varphi)\eta + (1-\varphi)\bar{w} - \gamma\mathcal{J}(\eta)}{(1-\varphi)} + \frac{(r+\gamma)c}{\varphi a}.$$

A sufficient condition for this to hold is,

$$\frac{(r+\gamma)c}{\varphi a} \leq \bar{m} + \frac{F(r+2\gamma)}{(1-\varphi)} + \eta_L - \bar{w}.$$

Similarly, a sufficient condition for good workers to engage in on-the-job search is,

$$\frac{(r+\gamma)c}{\varphi a} \leq \bar{m} + \frac{F(r+2\gamma)}{(1-\varphi)} + \eta_H - \bar{w}.$$

the expected present discounted values associated with hiring an employed and an unemployed applicant are,

$$\Pi_e = z_e J(\bar{m}, \eta_H) + (1 - z_e) J(\bar{m}, \eta_L), \quad (5)$$

$$\Pi_u = z_u J(\bar{m}, \eta_H) + (1 - z_u) J(\bar{m}, \eta_L). \quad (6)$$

Firms prefer to hire an employed applicant rather than an unemployed one, i.e.,  $\Pi_e > \Pi_u$ , since good workers are dismissed less often than bad ones and, thus,  $z_e > z_u$ , and firms make more profits out of good workers,  $J(\bar{m}, \eta_H) > J(\bar{m}, \eta_L)$ .

The firm hires the worker if  $\Pi_i > 0$ , it does not hire if  $\Pi_i < 0$ , and it is indifferent if  $\Pi_i = 0$ . Letting  $p_u$  be the probability that an unemployed worker is hired, then the hiring behavior is represented in the  $(p_u, z_u)$  plane by the EB locus in Figure 1. If the economy is above the horizontal PP line, then  $\Pi_u > 0$ . In this case, all unemployed and employed applicants are hired. If the economy lies on PP, then  $\Pi_e > \Pi_u = 0$ .<sup>8</sup> In this case, all employed applicants are hired, while unemployed applicants are only hired with probability  $p_u$  and, thus, there is discrimination in hiring against the unemployed. The lower hiring rate of the unemployed relative to employed workers reflects statistical discrimination, since firms use employment status to predict productivity. If the economy lies on PP, the EB locus shifts upwards whenever one of the labor cost parameters,  $F$  or  $\bar{w}$ , increases. This is because any parameter change that reduces profits must be offset by an increase in the quality of unemployed applicants. Otherwise, the incentive to hire them would disappear (see Appendix for proof).

### 2.2.3 Steady State Analysis

We complete the joint determination of  $p_u$  and  $z_u$  by deriving a steady state relationship between the two. In steady state, inflows into unemployment must be equal to outflows for each group of workers. Letting  $u$  be the unemployment rate, then:

$$\gamma G_H(z - uz_u) = ap_u uz_u, \quad (7)$$

$$\gamma G_L(1 - z - u(1 - z_u)) = ap_u u(1 - z_u), \quad (8)$$

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<sup>8</sup>We ignore the case where  $\Pi_u < 0$ , as it would imply a zero outflow from unemployment, so that all workers would be unemployed in steady state.

where  $G_i = G(m_c(\eta_i))$ ,  $i = H, L$ , and  $l_H = (z - uz_u)$  is total employment of good workers and  $l_L = (1 - z - u(1 - z_u))$  is total employment of bad workers. Eliminating  $u$  between these two equations allows us to derive the following steady state relationship between  $p_u$  and  $z_u$ ,

$$z_u = z \frac{\gamma + \frac{ap_u}{G_L}}{\gamma + ap_u \left( \frac{1-z}{G_H} + \frac{z}{G_L} \right)}. \quad (9)$$

This equation determines the steady state (S-S) locus, which provides a condition between  $p_u$  and  $z_u$  that keeps the composition of employment and unemployment time invariant. The S-S locus is downward sloping, because a lower  $p_u$ , i.e., a lower exit rate from unemployment, makes the steady state composition of the unemployment pool more similar to its source population - i.e., the employed, who are of better quality.

The equilibrium is determined by the point where the S-S locus crosses the EB locus. Hiring discrimination against the unemployed (i.e.,  $p_u < 1$ ) arises whenever the S-S locus cuts the EB locus along its horizontal portion PP (see Figure 2a). The job finding rates of employed and unemployed job seekers are the same if the S-S locus cuts the EB locus from above (see Figure 2b).

The total number of employed job seekers is given by the fraction of good workers who search among all good workers plus the fraction of bad workers who search among all bad workers,

$$l_s = l_H \frac{\tilde{A} \mathcal{G} - G_H}{1 - G_H} + l_L \frac{\tilde{A} \mathcal{G} - G_L}{1 - G_L}.$$

Consequently, using the steady state conditions, the proportion of good workers among employed job seekers is,

$$z_e = \frac{l_H \frac{\mathcal{G} - G_H}{1 - G_H}}{l_H \frac{\mathcal{G} - G_H}{1 - G_H} + l_L \frac{\mathcal{G} - G_L}{1 - G_L}}.$$

### 2.3 Effects of Firing Costs

The comparative statics relationship of interest is the effect of changes in firing costs,  $F$ , on the hiring of the unemployed. We have already seen that the EB locus shifts upwards when  $F$  increases. If the S-S locus did not

move, the increase in firing costs would make firms choosier and would lead to greater discrimination of the unemployed, i.e., a fall in  $p_u$ . However, the S-S locus does move when  $F$  increases because it affects the firing margins  $m_c(\eta_H)$  and  $m_c(\eta_L)$ . Both the inflow into unemployment of good and bad workers are reduced by firing costs. If the latter were reduced more than the former, then the quality of the unemployed would improve. However, if the inflow of bad workers was reduced more than the inflow of good workers, then the quality of the unemployed would worsen. The S-S locus could then move up or down. Proposition 1 shows that, under reasonable conditions about the distribution of the shocks, the S-S locus shifts down so that an increase in  $F$  unambiguously reduces  $p_u$ .

**PROPOSITION 1** - If the distribution  $G$  satisfies the nonincreasing hazard property, i.e.,

$$\frac{g(m)}{G(m)} \text{ is nonincreasing with } m, \quad (10)$$

the S-S locus moves down when firing costs,  $F$ , increase.

Proposition 1 which is proved in the Appendix shows that, given hiring policies, an increase in firing costs decreases the job loss rate more for good than for bad workers and, therefore, worsens the quality of the unemployed. This comes from two effects. First, as shown above, the dismissal threshold is more sensitive for good workers because of lower discounting. Second, if the nonincreasing hazards assumption holds, a given change in the dismissal threshold has a greater relative effect on the number of people being fired the smaller that number.<sup>9</sup> Since fewer good workers are fired, their firing rate falls proportionately more than for bad workers, thus, reducing the average quality of job losers.

Figure 3 illustrates Proposition 1. Higher firing costs exacerbate discrimination in hiring against unemployed workers, both because firms require better unemployed applicants and because under (10) firing costs reduce the quality of job losers.<sup>10</sup> In this model with adverse selection, higher firing

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<sup>9</sup>Of course, the nonincreasing hazard assumption need not hold, but it holds for a wide range of distributions, including the uniform distribution and any distribution that does not have an accentuated interior mode. Even when property (10) does not hold, we can still establish that, under reasonable conditions, discrimination against the unemployed disappears with low enough firing costs (see Appendix).

<sup>10</sup>In contrast, while an increase in wages also shifts the EB locus up, its effect on the S-S locus goes in the opposite direction of the effect of firing costs when the nonincreasing hazard assumption holds.

costs are likely to reduce job transition probabilities for unemployed but not for employed workers, for whom it is given by the exogenous instantaneous probability of receiving an offer,  $a$ . When  $a$  is made endogenous, as in the next section, the job finding rate of employed job seekers may also fall with  $F$ , but by less than the unemployed's. Furthermore, as shown below, the job-to-job flow may even go up with  $F$  as a greater fraction of the employed engage in on-the-job search.

### 3 Endogenous Meeting Rates

In this section, the meeting rate between firms and workers is now determined by firms' optimal choices about vacancies. In particular, total contacts between searching firms and workers are generated by a matching function,

$$h = m(v, u + l_s),$$

where  $v$  is the number of vacant jobs. Consequently, the arrival rate of offers and the arrival rates of employed and unemployed job seekers are,

$$a = \frac{m(v, u + l_s)}{u + l_s} = m(\theta, 1),$$

$$\lambda_e = \frac{l_s}{u + l_s} \frac{m(v, u + l_s)}{v} = \frac{l_s}{u + l_s} m\left(1, \frac{1}{\theta}\right) = \frac{l_s}{u + l_s} q(a), \quad (11)$$

$$\lambda_u = \frac{u}{u + l_s} \frac{m(v, u + l_s)}{v} = \frac{u}{u + l_s} m\left(1, \frac{1}{\theta}\right) = \frac{u}{u + l_s} q(a), \quad (12)$$

where  $\theta = \frac{v}{u + l_s}$  and  $q(a) = m\left(1, \frac{1}{\theta}\right)$ , with  $q'(a) < 0$ .

The number of vacant jobs is determined by the entry decision of firms, where the value of a vacancy  $V$  satisfies,

$$rV = -C + \lambda_e (\Pi_e - V) + \lambda_u p_u (\Pi_u - V). \quad (13)$$

An equilibrium is a set of endogenous variables such that, in addition to the equilibrium conditions derived in the previous section, the equilibrium condition  $V = 0$  holds. Hence, eliminating  $\lambda_e$  and  $\lambda_u$ , we have one additional endogenous variable,  $a$ , and one additional equilibrium condition.

In equilibrium, free entry implies that  $V = 0$ , and this free entry condition determines the total number of vacancies,  $v$ . Given the equilibrium value

of  $a$ , the arrival rates and the number of vacancies can then be recursively computed using the preceding equations.

The following theorem (see proof in Appendix) tells us that an equilibrium always exists and that, when nontrivial, it is “well behaved.”

**THEOREM -**

(i) Either there exists a zero employment equilibrium such that  $a = 0$  and  $u = 1$ , or

(ii) there exists an equilibrium with  $a > 0$ , which is “stable” in the sense that the value of the firm is locally decreasing in  $a$ .

A sufficient condition for (i) to be ruled out is  $zJ(\bar{m}, \eta_H) + (1 - z)J(\bar{m}, \eta_L) > 0$ , where the  $J$ 's are computed using  $a = 0$ . This means that  $a = 0$  cannot be an equilibrium, since it would then be profitable for an atomistic firm to deviate by hiring an unemployed worker, who would never quit and is good with probability  $z$ . The last part of claim (ii) refers to the case where  $a$  is treated as exogenous, as in the previous section. This means that around the equilibrium value of  $a$ , the value of a vacancy,  $V$ , is negatively related to labor market tightness,  $a$ .

This stability property implies that any parameter shift which reduces the value of the firm given  $a$ , will reduce the equilibrium value of  $a$ . This is typically true of an increase in the firm's labor costs,  $F$ ,  $\bar{w}$ , and  $\varphi$ . Since it is difficult to say more analytically, we turn to numerical simulations.

The simulation results, reported in Table 1, suggest the following conclusions:

1. For low values of  $F$ , low quality workers do not engage in on-the-job search because the threshold value of  $m$  at which they are fired is higher than the threshold value of  $m$  below which they search. In this zone, an increase in  $F$  increases  $a$ . In this zone,  $p_u = 1$ , and  $z_e = 1$ , as all employed job seekers are of good quality. The economy then moves to a zone where both types of workers search on the job as  $F$  increases. In this zone,  $p_u$  and  $a$  fall monotonically with  $F$ , and one eventually reaches a zone where  $p_u < 1$ .

2. For  $F > 0.1$ , the unemployment-to-job flow, which is equal to  $ap_u$ , falls with  $F$ , and its fall accelerates in the zone where  $p_u < 1$ , where both  $a$  and  $p_u$  fall in response to  $F$ .

3. The job-to-job flow is hump-shaped, as a result of two conflicting effects. First, an increase in firing costs widens the distribution of productivity levels among employed workers, thus increasing the proportion of employed workers engaged in on-the-job search. Second, it reduces  $a$ , thus reducing the job finding rate of all job seekers. Our simulations suggest that at low

firing costs the first effect dominates, while the second does at high firing costs.

4. The job loss rate monotonically decreases with  $F$ , as expected.

5. In the zone where  $p_u = 1$ , the quality of unemployed job seekers falls with  $F$  for  $F > 0.2$ . This is because under the conditions of Proposition 1 the inflow into unemployment is more responsive to  $F$  for good than for bad workers. In the zone where  $p_u < 1$ , the quality of the unemployed goes up with  $F$ , due to the mechanisms already explained in the previous section. The quality of employed job seekers follows a similar U-shaped pattern.

6. The unemployment rate,  $u$ , falls with  $F$  in the zone where  $p_u = 1$ , implying that the effect of a lower job loss rate is stronger than that of a lower job finding rate. The unemployment rate goes up in the zone where  $p_u < 1$ , where the job finding rate falls much more rapidly in response to  $F$  due to the downward adjustment of the discrimination parameter  $p_u$ .

Similar to the results with exogenous meeting rates, these results show that as firing costs rise, the job finding rates of the unemployed decrease relative to those of the employed.

## 4 The Impact of Dismissal Costs on Accession Rates

This section provides evidence on the impact of unjust-dismissal provisions in the U.S. on the re-employment and job-transition probabilities of unemployed and employed workers. Before turning to the data and the empirical analysis, we provide a description of the changes in firing costs in U.S. states over the 1970's and 1980's.<sup>11</sup>

### 4.1 Exceptions to Employment-at-will

Until the 1959 ruling by California's Appellate Court imposing restrictions on dismissals, the common-law rule known as the employment-at-will doctrine applied in all U.S. states. The employment-at-will doctrine determined that employers could "discharge or retain employees at-will for good cause or for no cause, or even for bad cause without thereby being guilty of an unlawful

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<sup>11</sup>Much of the description on the evolution of the legal environment that follows is based on Autor (2000), Dertouzos and Karoly (1992), and Miles (2000).

act per se.”<sup>12</sup> During the 1980’s the U.S. experienced a sharp and probably unanticipated rise in the recognition of exceptions to employment-at-will, leaving only four out of the fifty-one states as strictly employment-at-will states by the 1990’s.

The exceptions to at-will employment adopted during the last few decades in the U.S. can be grouped into three main categories: the implied contract doctrine, the public policy doctrine, and the covenant of good faith and fair dealing. The implied contract doctrine establishes that the employment relationship may be governed by implied contractual provisions restricting the ability of employers to terminate employees. The courts establish evidence of an implied contract from written and oral statements, employment practices and manuals, employees’s length of service, and the general context of the employment relationship. While only six states had recognized the implied contract doctrine by 1981, by the 1990’s forty two states had introduced exceptions to employment-at-will based on the implied contract rule.

Public policy exceptions bar employers from terminating employees for refusing to commit an act contrary to public policy or for committing an act protected by public policy. The public policy doctrine is usually defined to include only statutes. Only in a few cases, has it been applied more broadly to include regulations, administrative rules, and professional codes of ethics. For this reason, the public policy doctrine appears to be less restrictive to employers than the implied contract exception. The public policy doctrine was first recognized in 1959 by California, but it was only widely accepted by most states during the 1980’s. By the 1990’s, 42 states had recognized the public policy doctrine, but only eight of them in its broader form.

A third less-widely recognized exception is the covenant of good faith and fair dealing, which bars employers from dismissing workers in order to deprive them from earned benefits (e.g., pensions and bonuses). Many legal scholars have considered the covenant of good faith as being potentially the most far reaching of the three doctrines, in that it can imply that dismissal must always be for cause. However, in spite of the early recognition of this doctrine in 1974, only 12 other states had issued similar decisions in support of this exception by the 1990’s.

There is little information on the actual costs imposed by these unjust dismissal exceptions. A study of wrongful discharge cases by Dertouzos et al. (1988) in California, however, reported average compensatory damages

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<sup>12</sup>Payne v. Western & Atlantic Railroad (1884), Tennessee Supreme Court.

of \$388,500 and average legal fees of \$98,000 in cases where the defense won and \$220,000 in cases where the plaintiff won. The costs going to third parties (i.e., lawyers) suggest the importance of the firing tax component of dismissal costs.

In the empirical analysis that follows, we distinguish among the three types of exceptions. We construct the dismissal legislation variables using the classifications of the doctrines in Autor (2000) and checked the robustness of our results using the classification provided by Dertouzos and Karoly (1992).<sup>13</sup>

## 4.2 Data Description

We use the random sample of 6,111 individuals in the NLSY for the years 1979-84 and 1996. In these years employed workers were asked about their job search activities and, in particular, were asked whether they were looking for another job. This allows us to contrast employed and unemployed job seekers. The unemployed are defined in the usual way as individuals who did not work during the survey week and were looking for work or on layoff. Employed job seekers are defined as those individuals who worked during the survey week and were looking for work. These same definitions were used by Blau and Robbins (1990) and Holzer (1988) in studies of job search by employed and unemployed workers.

The NLSY work history file allows us to track employer-specific data and to correctly identify job-to-job transitions. For multiple job holders, the ‘main job’ was identified as the job in which the worker earned the most during that week. Moreover, since observations are defined by search spells of employed and unemployed workers, an individual worker can contribute more than one observation if, for example, the worker is unemployed during two or more sample years or if the worker is an employed job seeker in one sample year and unemployed in another. We eliminated the following observations from the sample: all observations with a real wage less than one 1979 dollar, workers in the public sector, persons serving in the military, agricultural workers, and the self-employed.<sup>14</sup> In addition, while the youngest person in

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<sup>13</sup>Since the results using the Dertouzos and Karoly (1992) classification were almost identical to those using the classification provided by Autor (2000), we only present the results based on the latter.

<sup>14</sup>Workers in the public sector and the military are eliminated because we want to concentrate on workers hired by profit-making businesses. Agricultural workers are eliminated

the NLSY enters the sample at 14, we restrict our sample to workers 17 years of age or older. The oldest workers reach age 39 in our sample period.

Most importantly for our purposes, the Geocode file allows to generate the job security provision variables, as it identifies the state of residence of each individual at the time of the interview. The Geocode file contains the unemployment rate in the respondent's county of residence.

### 4.3 Descriptive Statistics

Simple comparisons show that workers covered by unjust-dismissal provisions have higher job-finding rates than uncovered workers. This can be seen in the first row of Table 2, which reports the job-finding probability of workers covered by exceptions to be 0.026 higher than for uncovered workers. As Table 3 shows, this difference comes from the higher job-finding rates of the employed covered by exceptions, but hides the lower job-finding rates of unemployed workers covered by exceptions. Other comparisons by unjust-dismissal status show broadly similar characteristics between the two groups of workers. For example, the overall proportion of searchers unemployed is 41.3% and slightly higher among those covered by exceptions than among those in employment-at-will states, but the difference is not statistically significant.<sup>15</sup>

To illustrate the differential impact of unjust-dismissal provisions on unemployed and employed job seekers, Table 3 presents a set of contrasts in accession rates between unemployed and employed individuals in adopting and non-adopting states. The first panel of Table 3 shows differences in average accession rates for workers in covered states (i.e., adopting states after adoption of the doctrines) and uncovered states (i.e., non-adopting states as well as adopting states before adoption), for unemployed and employed workers. For example, the first and second rows in the first column show that the average job-finding rate of unemployed workers in covered states is 0.503, while the average job-finding rate of unemployed workers in uncovered states is 0.53. The third row presents the difference in average job-finding

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because these workers are likely to have seasonal contracts and unlikely to be subject to unjust-dismissal doctrines. The self-employed are eliminated because they are not subject to adverse selection problems.

<sup>15</sup>This implies that about 60% of searchers in our sample are employed. Statistics not shown in the table indicate that about 20% of employed workers search, with about equal proportions searching in covered and non-covered states.

rates between covered and uncovered workers. These results show that the average job-finding rate is 0.03 lower for unemployed workers and 0.05 higher for employed workers in adopting compared to non-adopting states. The last row in Panel A contrasts the difference in average job-finding rates between covered and uncovered workers for those employed and unemployed. The results show that the employed-unemployed difference in average job-finding rates increased for workers living in states that introduced unjust-dismissal exceptions relative to the control group living in non-adopting states.

Panels B, C, and D show similar estimates for unemployed and employed workers, where coverage status is defined for the implied contract, public policy, and good faith doctrines separately. The results in the last row of Panels B, C, and D show that the employed-unemployed job-finding difference increased in those states that introduced each of these doctrines compared to those that did not.

#### 4.4 Probit Estimates

To estimate the impact of unjust-dismissal exceptions on the re-employment probabilities of unemployed relative to employed workers while controlling for other variables, we estimate the following reduced-form probit model:

$$\Pr(y_{ijt} = 1|x_{ijt}, u_{ijt-1}) = \Phi(\alpha'x_{ijt} + \tau_t + \theta_j + \delta u_{ijt-1} + \beta_{0t}u_{ijt-1} + \beta_{1j}u_{ijt-1} + \beta_2'd_{jt} + \beta_3'd_{jt} \times u_{ijt-1}),$$

where the dependent variable  $y_{ijt}$  takes the value of one if an unemployed or employed worker was observed searching for a job at time  $t - 1$  and has found a job by the next calendar year and zero if he did not find a job within that calendar year. The vector  $x_{ijt}$  includes a set of individual controls for individual  $i$  living in state  $j$  at time  $t$ . The terms  $\theta_j$  and  $\tau_t$  are state and year effects, and  $u_{ijt-1}$  is an unemployment dummy which takes the value of 1 if the person was unemployed and the value of 0 if the person was employed and searching for another job at time  $t - 1$ . The parameter  $\beta_{0t}$  captures differences in year effects by employment status and  $\beta_{1j}$  captures differences in state effects by employment status. The set of dummies,  $d_{jt}$ , indicate coverage by the three unjust-dismissal exceptions, which take the value of 1 if the individual is observed living in a state  $j$  that has adopted the implied contract, public policy, or good faith exceptions at time  $t$  and zero otherwise.

The vector  $\beta_2$  thus measures the direct impact of unjust-dismissal exceptions on employed workers. Finally, the vector  $\beta_3$  measures the differential impact of unjust-dismissal exceptions on the unemployed relative to employed workers.

Table 4 presents estimates from the probit of the direct impact of unjust-dismissal exceptions on employed workers and their relative impact on the unemployed,  $\beta_2$  and  $\beta_3$ , as well as the impact of unemployment status on job-finding probabilities,  $\delta$ . The first four columns of Table 4 present the results for the probit with basic controls.<sup>16</sup> The coefficient  $\beta_3$  in Column (1) shows that the implied contract exception reduces the job finding probability of unemployed workers by 0.175 relative to employed workers. Columns (2) and (3) show smaller effects for unemployed relative to employed workers covered by the public policy and good faith doctrines, 0.091 and 0.073 respectively. Column (4) shows similar results when all three exceptions are included.<sup>17</sup> These results also indicate that the job-finding probability of unemployed workers is about 0.4 higher than for employed workers.

Columns (5)-(8) in Table 4 show the results of the probits with the basic controls as well as all first-level and second-level main effects: time and state effects, and time-unemployed and state-unemployed interactions. Time effects are included to capture the possibility that the introduction of exceptions may have coincided with other changes that were instead responsible for the low job-finding rates. State effects are included because the exceptions may be capturing the low job-finding rates of workers in those states that introduced exceptions for reasons unrelated to the exceptions. The time-unemployed and state-unemployed interactions are included to control for time-specific and state-specific factors affecting the unemployed but unrelated to the unjust-dismissal doctrines. In addition, these probits include interaction between time and region effects to control for time-varying regional shocks that may affect accession rates. Columns (5) and (6) in Table 4 indicate smaller effects of the implied contract and public policy exceptions on the job-finding probability of the unemployed relative to employed

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<sup>16</sup>The controls include: age, education, number of children, tenure, wage, non-wage income, local unemployment rate, dummies for race, sex, and marital status, a manufacturing dummy, a union dummy, and a white-collar dummy. The job related variables (i.e., tenure, wage, union, sector, and occupation) for the unemployed refer to their previous job.

<sup>17</sup>The estimates in Columns (1)-(4) are quite precise because these models omit main state and year effects.

workers, after controlling for time, state, time, and time-unemployed, state-unemployed and time-region interaction terms. Column (7), however, shows a larger effect of the good faith exception when all first-level and second-level terms are included, indicating that this exception reduces the job-finding probability of unemployed workers by 0.122. This corresponds to a reduction of about 23% in the unemployed's job-finding probability from 0.516 to 0.394. The results in Column (8), including all exceptions, show that the exceptions together reduced the job-finding probability of the unemployed by 0.161 relative to employed workers.

Columns (9)-(12) in Table 4 present results for the probits including the basic controls, all first- and second-level main effects, and also an unemployment benefit receipt variable. The unemployment benefit variable is included because the lower job-finding probability for the unemployed in states with exceptions may be capturing the higher propensity for the unemployed to claim benefits in these states. Column (9)-(12) show very similar effects of the exceptions after controlling for unemployment benefit receipt.

The results in Table 4 show a negative impact of dismissal costs on the job-finding probabilities of unemployed relative to employed workers. Our results are robust to the inclusion of time and state effects, time-specific and state-specific effects on the unemployed, time-region interactions and unemployment benefit receipt.<sup>18</sup>

Tables 5 and 6 present additional evidence consistent with the lemons story. Following Gibbons and Katz (1991), in Table 5 we examine the impact of dismissal costs on nonunion and union workers. Since firms have less discretion firing workers covered by collective-bargaining agreements, the lemons effect generated by dismissal costs should be smaller for union workers. Columns (1)-(4) in Table 5 show the results for the nonunion sub-

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<sup>18</sup>To further probe the robustness of the results, we estimate probits which control for the maximum available welfare benefits (including AFDC benefits and food stamps) in a state at each point in time, since during this time period not only did unjust-dismissal legislation change differentially across states but also the generosity of welfare benefits. The results including welfare benefits are similar to those reported in Table 4 and even slightly larger. In addition, we estimate models allowing for differential effects of the basic controls on unemployed and employed workers. The magnitude of the effects is somewhat smaller but remains large and significant. Finally, we estimate analogous linear probability and logit models with and without individual fixed-effects. The resulting individual fixed-effects estimates are less precise but also suggest that the exceptions had large negative effects on the unemployed relative to employed workers.

sample and Columns (5)-(8) for the union sub-sample.<sup>19</sup> Consistent with a lemons story, the estimates suggest that the implied contract and public policy doctrines had larger effects on nonunionized than unionized workers.

Table 6 presents results by reason for separation. It is widely believed that firms use temporary contracts as a way of avoiding dismissal costs and also as a way of screening workers (see, e.g., Autor (2000, 2001)). One may thus expect for workers who have separated due to the end of one of these contracts to be stigmatized by unemployment in the same way dismissed workers are. At the same time, stigma effects should become less important for those under temporary contracts relative to those under permanent contracts as dismissal costs rise. As dismissal costs rise, firms will use more discretion in dismissing those under permanent contracts but not those under temporary contracts. Table 6 shows estimates of models including interactions with a dismissal dummy.<sup>20</sup> These results indicate higher job-finding probabilities of dismissed relative to end-of-contract workers in employment-at-will states, but smaller relative job-finding probabilities for dismissed workers covered by the exceptions.

## 5 Conclusion

The matching model with asymmetric information presented in this paper shows that firing costs are likely to generate hiring discrimination against the unemployed. This is true whether or not meeting rates are endogenous. Estimates using the NLSY indicate increased discrimination in hiring against the unemployed in the U.S. over the 1980's in those states that introduced exceptions to employment-at-will. These results are unchanged by including state and time effects, time-specific and state-specific effects on the unemployed, interactions between region and time effects, unemployment benefit receipt, and welfare benefits. Moreover, consistent with a lemons story, we find that the relative effect of the exceptions on the unemployed is generally

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<sup>19</sup>There are too few observations in the union/good faith sample to be able to estimate the impact of the good faith doctrine on unionized workers.

<sup>20</sup>In this case, the sub-samples of dismissed and end-of-contract workers are too small for the completely separate analysis to be informative. Since our model does not make predictions about voluntary quitters into unemployment, we exclude them from our sample and consider only dismissed and end-of-contract workers. Effects on voluntary quitters are harder to interpret since this sort of exit may be taken as a signal of weak labor market attachment.

smaller for unionized workers, who are subject to layoff-by-seniority rules, and for those who lost their jobs due to an end-of-contract and, thus, are not subject to dismissal costs.

While our empirical analysis used U.S. data, the results also have implications for European labor markets. Since European countries have high dismissal costs compared to North-America, European firms should discriminate even more against unemployed job seekers. These predictions are consistent with the findings in Bertola and Rogerson (1997) and Boeri (1999), which show much lower flows into and out of unemployment but similar job-to-job flows in the two continents. Our paper suggests that employment protection legislation together with information asymmetries probably play an important role in explaining these differences.

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## Appendix

**PROPERTIES OF EQUATION (4)** - The RHS of equation (4) is increasing in the dismissal threshold  $m_c(\eta)$ , so that equation (4) determines  $m_c$  uniquely. Totally differentiating equation (4) with respect to  $\eta$ ,  $\bar{w}$ , and  $F$  we get,

$$\begin{aligned}\frac{dm_c}{d\eta} &= -1 - \frac{\gamma}{(1-\varphi)} \frac{d\mathfrak{P}(\eta)}{d\eta}, \\ \frac{dm_c}{d\bar{w}} &= 1 - \frac{\gamma}{(1-\varphi)} \frac{d\mathfrak{P}(\eta)}{d\bar{w}}, \\ \frac{dm_c}{dF} &= -\frac{(r+\gamma+a)}{(1-\varphi)} - \frac{\gamma}{(1-\varphi)} \frac{d\mathfrak{P}(\eta)}{dF},\end{aligned}$$

and differentiating equation (5) with respect to  $\eta$ ,  $\bar{w}$ , and  $F$  and using the envelope theorem we obtain,

$$\begin{aligned}\frac{d\mathfrak{P}(\eta)}{d\eta} &= \frac{\frac{(1-\varphi)}{(r+\gamma)} (G(\bar{m}) - G(\bar{\theta})) + \frac{(1-\varphi)}{(r+\gamma+a)} (G(\bar{\theta}) - G(m_c))}{1 - \frac{\gamma}{(r+\gamma)} (G(\bar{m}) - G(\bar{\theta})) + \frac{\gamma}{(r+\gamma+a)} (G(\bar{\theta}) - G(m_c))} > 0, \\ \frac{d\mathfrak{P}(\eta)}{d\bar{w}} &= -\frac{d\mathfrak{P}(\eta)}{d\eta} < 0, \\ \frac{d\mathfrak{P}(\eta)}{dF} &= \frac{-G(m_c(\eta))}{1 - \frac{\gamma}{(r+\gamma)} (G(\bar{m}) - G(\bar{\theta})) + \frac{\gamma}{(r+\gamma+a)} (G(\bar{\theta}) - G(m_c))} < 0.\end{aligned}$$

Substituting these into the above equations, we obtain that,  $\frac{dm_c}{d\eta} < 0$ ,  $\frac{dm_c}{d\bar{w}} > 0$ , and  $\frac{dm_c}{dF} < 0$ .

Furthermore, we can see that the dismissal threshold of good workers responds more to changes in labor costs than the dismissal threshold of bad workers. Given that  $\frac{dm_c}{d\eta} < 0$  and, thus,  $m_c(\eta_H) < m_c(\eta_L)$ , then  $0 > \frac{d\mathfrak{P}(\eta_H)}{dF} > \frac{d\mathfrak{P}(\eta_L)}{dF}$  and we get that,

$$0 > \frac{dm_c(\eta_L)}{dF} > \frac{dm_c(\eta_H)}{dF}.$$

Similarly, given that  $m_c(\eta_H) < m_c(\eta_L)$ , then  $0 > \frac{d\mathfrak{P}(\eta_L)}{d\bar{w}} > \frac{d\mathfrak{P}(\eta_H)}{d\bar{w}}$  and,

$$\frac{dm_c(\eta_H)}{d\bar{w}} > \frac{dm_c(\eta_L)}{d\bar{w}} > 0,$$

which proves that there is a greater response of  $m_c(\eta_H)$  than of  $m_c(\eta_L)$  to changes in  $F$  and  $\bar{w}$ .

**PROPERTIES OF EB** -  $\Pi_u$  can be written as a function of  $z_u$  and the exogenous parameters of the model.  $J(\bar{m}, \eta_H)$  and  $J(\bar{m}, \eta_L)$  can be computed using (3) and substituting  $\mathfrak{p}(\eta)$ , which only depends on  $m_c(\eta)$  and on exogenous parameters. Given that  $m_c(\eta)$  is a sole function of such parameters,  $\Pi_u$  can be written as a function of  $z_u$  and exogenous parameters,

$$\begin{aligned} 0 &= \Pi_u = z_u J(\bar{m}, \eta_H) + (1 - z_u) J(\bar{m}, \eta_L) \\ &= z_u \left[ \frac{(1 - \varphi)(\bar{m} + \eta_H - \bar{w})}{(r + \gamma + a)} \right. \\ &\quad \left. + \frac{\gamma \int_{\bar{m}}^{\infty} \frac{(1 - \varphi)(m + \eta_H - \bar{w})}{(r + \gamma)} g(m) dm + \int_{m_c(\eta_H)}^{\infty} \frac{(1 - \varphi)(m + \eta_H - \bar{w})}{(r + \gamma + a)} g(m) dm - FG(m_c(\eta_H))}{(r + \gamma + a) \left[ 1 - \frac{\gamma}{(r + \gamma)} [G(\bar{m}) - G(m_c(\eta_H))] - \frac{\gamma}{(r + \gamma + a)} [G(m_c(\eta_H)) - G(m_c(\eta_H))] \right]} \right] \\ &\quad + (1 - z_u) \left[ \frac{(1 - \varphi)(\bar{m} + \eta_L - \bar{w})}{(r + \gamma + a)} \right. \\ &\quad \left. + \frac{\gamma \int_{\bar{m}}^{\infty} \frac{(1 - \varphi)(m + \eta_L - \bar{w})}{(r + \gamma)} g(m) dm + \int_{m_c(\eta_L)}^{\infty} \frac{(1 - \varphi)(m + \eta_L - \bar{w})}{(r + \gamma + a)} g(m) dm - FG(m_c(\eta_L))}{(r + \gamma + a) \left[ 1 - \frac{\gamma}{(r + \gamma)} [G(\bar{m}) - G(m_c(\eta_L))] - \frac{\gamma}{(r + \gamma + a)} [G(m_c(\eta_L)) - G(m_c(\eta_L))] \right]} \right]. \end{aligned} \tag{14}$$

Furthermore,  $\frac{\partial \Pi_u}{\partial z_u} = J(\bar{m}, \eta_H) - J(\bar{m}, \eta_L) > 0$ . Therefore, there exists a unique value of  $\bar{z}_u$  such that the condition  $\Pi_u = 0$  is satisfied. This defines a horizontal line PP, which delimits the plane between a region where  $\Pi_u > 0$ , in which case  $p_u = 1$ , and a region where  $\Pi_u < 0$ , in which case  $p_u = 0$ . This establishes the shape of the EB locus.

Next, totally differentiating (14), we obtain that the derivatives of the second and fourth terms in the brackets with respect to  $m_c(\eta)$  are zero. Thus, the effects of  $F$  and  $\bar{w}$  on  $z_u$  reduce to the direct effects of these parameters on profits,

$$\frac{dz_u}{dF} = \frac{\gamma \frac{z_u G(m_c(\eta_H))}{D_H} + \frac{(1 - z_u) G(m_c(\eta_L))}{D_L}}{(r + \gamma + a) (J(\bar{m}, \eta_H) - J(\bar{m}, \eta_L))} > 0,$$

$$\frac{dz_u}{d\bar{w}} = \frac{(1-\varphi) \frac{z_u}{D_H} + \frac{(1-z_u)}{D_L}}{(r+\gamma+a)(J(\bar{m}, \eta_H) - J(\bar{m}, \eta_L))} > 0,$$

where  $D_H = 1 - \frac{\gamma}{(r+\gamma)} [G(\bar{m}) - G(\bar{\theta})] - \frac{\gamma}{(r+\gamma+a)} [G(\bar{\theta}) - G(m_c(\eta_H))]$  and  $D_L = 1 - \frac{\gamma}{(r+\gamma)} [G(\bar{m}) - G(\bar{\theta})] - \frac{\gamma}{(r+\gamma+a)} [G(\bar{\theta}) - G(m_c(\eta_L))]$ .

**PROOF THAT S-S IS DOWNWARD SLOPING** - Differentiating equation (9) with respect to  $p_u$ , shows that the sign of the slope is equal to the sign of the following expression,

$$\frac{dz_u}{dp_u} \propto \gamma a z (1-z) \left( \frac{1}{G_L} - \frac{1}{G_H} \right),$$

which is negative since  $G_H < G_L$ . Q.E.D.

**PROOF OF PROPOSITION 1** - Differentiating equation (9), while holding  $p_u$  constant, the direction of the move of the S-S locus in response to an increase in  $F$  is of the same sign as,

$$\begin{aligned} \frac{dz_u}{dF} \propto & -\gamma \frac{g_L}{(G_L)^2} \frac{dm(\eta_L)}{dF} - \frac{g_H}{(G_H)^2} \frac{dm(\eta_H)}{dF} \\ & - \frac{ap_u}{G_H G_L} \frac{g_L}{G_L} \frac{dm(\eta_L)}{dF} - \frac{g_H}{G_H} \frac{dm(\eta_H)}{dF}, \end{aligned}$$

We know from the properties of equation (4) that  $0 > \frac{dm_c(\eta_L)}{dF} > \frac{dm_c(\eta_H)}{dF}$ . Thus, given that  $G_L > G_H$  and the nonincreasing hazard assumption,  $\frac{dz_u}{dF}$  is clearly negative. Q.E.D.

**PROOF THAT IF  $F$  IS LOW ENOUGH,  $p_u = 1$**  - Assume  $\bar{m} + \eta_H > \bar{w}$ . This means that it is at least profitable for firms to employ good workers in the best possible state. At  $F = 0$ , one has  $J(\bar{m}, \eta_H) > -F = 0$  and  $J(\bar{m}, \eta_L) \geq -F = 0$ , implying  $\Pi_u > 0$  for all  $z_u$ . By continuity, this property holds in the neighborhood of  $\bar{F} = 0$ . Q.E.D.

**PROOF OF THEOREM** - Equation (13) is equivalent to

$$C = \lambda_e \Pi_e + \lambda_u p_u \Pi_u. \quad (15)$$

The equations of Section 2 as well as (11) and (12) determine, in a reduced form, the RHS of (15) as a function of  $a$ . Inspection of the relevant equations reveals that this function is continuous.<sup>21</sup> Call it  $H(a)$ . Next, note that as  $a$

<sup>21</sup>Note that  $J(m, \eta)$  has a discontinuity as  $m$  goes through  $\bar{m}$ . However what intervenes in the determination of the RHS of (15) is  $J(\bar{m}, \eta)$ , which is clearly continuous in  $a$ .

goes from any  $a_0$  to infinity, the  $\lambda'$ s are bounded from above by  $q(a_0)$ , while (3) implies that  $\Pi_e$  and  $\Pi_u$  go to zero. Consequently,

$$\lim_{a \rightarrow \infty} H(a) = 0.$$

Finally, if  $H(0) \leq C$ , then there exists an equilibrium such that  $a = 0$ ,  $u = 1$ , i.e. where no hiring is profitable. If not, then  $H(0) > C$ , in which case, by continuity, there exists an  $a$  such that  $H(a) = C$  and  $H(\cdot)$  is locally decreasing around  $a$ . Q.E.D.

Figure 1: EB Locus

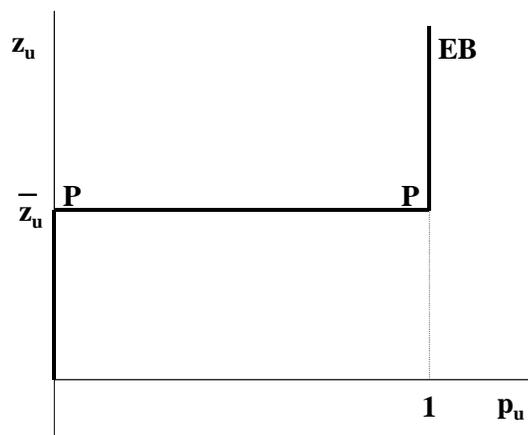


Figure 2.a: Equilibrium

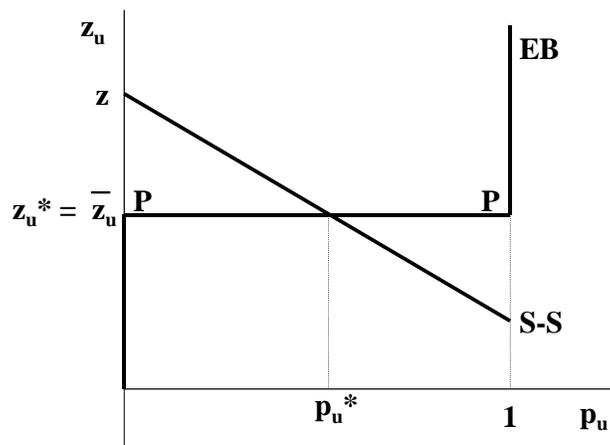


Figure 2.b: Equilibrium

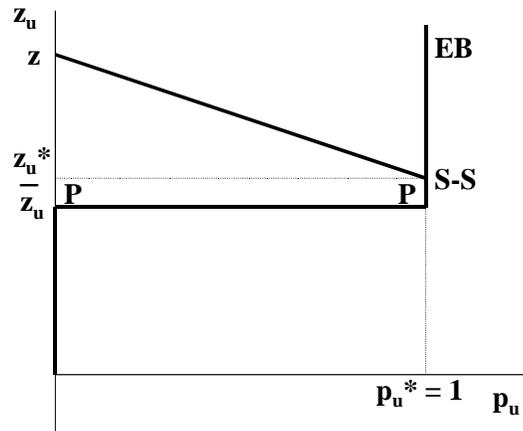


Figure 2.c: Equilibrium

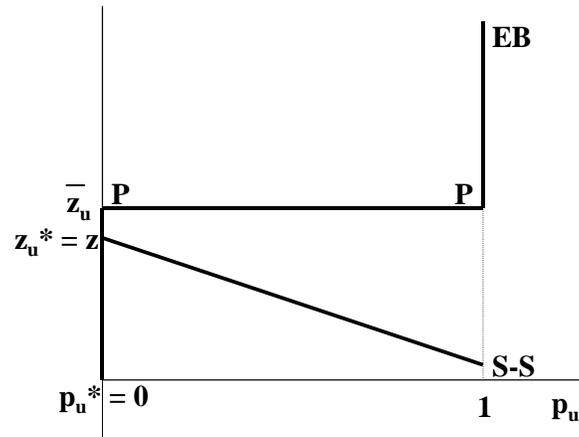


Figure 3.a: Comparative Statics of  
Increases in  $F$

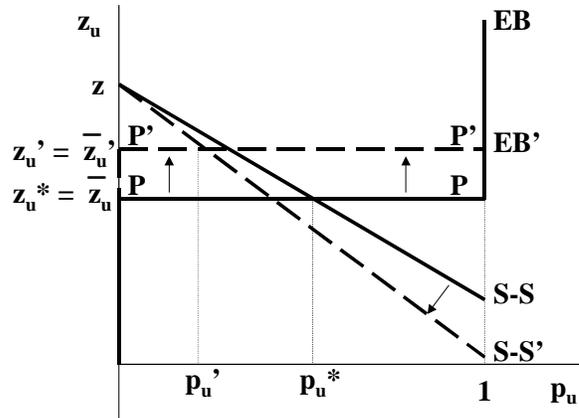


Figure 3.b: Comparative Statics of  
Reductions in  $F$

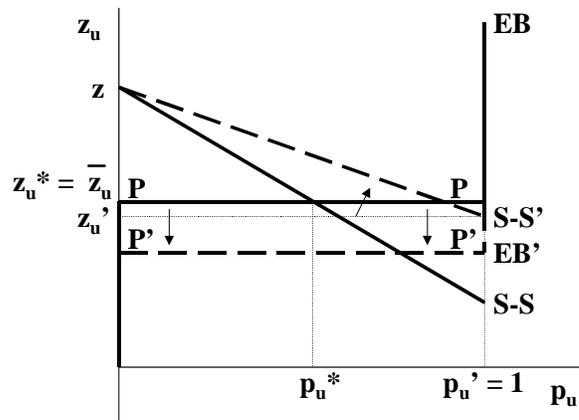


Table 1: Numerical Simulations of Effects of Firing Costs  
on Labor Market Flows

F	a	$p_u$	U-E	E-E	E-U	$z_u$	$z_e$	u
0	0.79	1	0.79	0.01	0.089	0.445	1	0.1
0.1	0.83	1	0.83	0.09	0.079	0.389	1	0.087
0.2	0.76	1	0.76	0.179	0.057	0.402	0.641	0.069
0.25	0.736	1	0.736	0.222	0.049	0.386	0.597	0.063
0.3	0.716	1	0.716	0.262	0.042	0.364	0.574	0.056
0.35	0.698	1	0.698	0.3	0.036	0.334	0.56	0.049
0.37	0.691	1	0.691	0.31	0.033	0.319	0.56	0.045
0.38	0.679	0.47	0.321	0.311	0.032	0.322	0.565	0.09
0.39	0.66	0.26	0.173	0.306	0.031	0.33	0.579	0.15
0.4	0.65	0.17	0.113	0.301	0.031	0.34	0.59	0.213
0.41	0.64	0.13	0.08	0.3	0.03	0.347	0.61	0.269
0.42	0.627	0.097	0.06	0.293	0.029	0.355	0.619	0.323
0.45	0.59	0.052	0.03	0.281	0.027	0.379	0.658	0.469

Notes: The set of parameters used for the simulation are as follows:  $\gamma = 0.1$ ,  $r = 0.05$ ,  $\bar{m} = 1$ ,  $\eta_H = 0.7$ ,  $\eta_L = 0.5$ ,  $\bar{w} = 1.5$ ,  $z = 0.5$ ,  $c = 0.5$ ,  $C = 2.3$ ,  $\phi = 0.5$ . The  $q(\bullet)$  function was chosen as  $q(a) = q_0 a^{-\delta}$ , with  $q_0 = 2$  and  $\delta = 5$ , and shocks are uniformly distributed over  $[0, \bar{m}]$ .

Table 2: Descriptive Statistics

Variable	Sample		
	Entire Sample	Covered by Exceptions	Not Covered by Exceptions
Searcher Found Job within a Year	0.328	0.339	0.313
Proportion of Searchers Unemployed	0.413	0.417	0.406
Age	22.259 (4.556)	22,982 (5.075)	21.077 (3.324)
Male	0.589	0.591	0.586
White	0.681	0.726	0.616
Other Race	0.046	0.054	0.031
Married	0.221	0.239	0.191
No. of Children	0.447 (0.877)	0.535 (0.984)	0.335 (0.705)
Education	12.082 (1.94)	12.201 (1.952)	11.876 (1.886)
White-collar Worker	0.601	0.609	0.587
Manufacturing Sector	0.286	0.281	0.295
Union Member	0.163	0.165	0.159
Tenure	40.044 (25.866)	41.401 (26.661)	38.056 (24.27)
Wage	520.8 (474.9)	566.4 (546.3)	446.3 (323.7)
Non-wage Income	16,189 (25,438)	17,757.9 (30,383.7)	13,705.4 (14,451.3)
Local	8.812	9.511	7.751
Unemployment Rate	(3.599)	(3.829)	(2.932)
N	4,776	2,918	1,858

Notes: The table reports means of all variables. The sample includes only unemployed workers and employed job searchers. The Covered column includes means for individuals in adopting states after the adoption of the doctrines. The Not Covered column includes means for individuals in non-adopting states and in adopting states before adoption. Standard deviations are in parentheses.

Table 3: Average Job Finding Rates

	Unemployed	Employed
<b>A. All Exceptions</b>		
Covered	0.503 (0.01)	0.22 (0.007)
Uncovered	0.53 (0.013)	0.166 (0.008)
Covered-Uncovered Differences	-0.027 (0.016)	0.054 (0.01)
Unemployed-Employed Difference in Differences		-0.081 (0.019)
<b>B. Implicit Contract</b>		
Covered	0.487 (0.012)	0.244 (0.009)
Uncovered	0.531 (0.01)	0.171 (0.006)
Covered-Uncovered Differences	-0.044 (0.016)	0.073 (0.011)
Unemployed-Employed Difference in Differences		-0.117 (0.019)
<b>C. Public Policy</b>		
Covered	0.505 (0.011)	0.225 (0.008)
Uncovered	0.521 (0.011)	0.174 (0.007)
Covered-Uncovered Differences	-0.015 (0.015)	0.05 (0.01)
Unemployed-Employed Difference in Differences		-0.066 (0.019)
<b>D. Good Faith</b>		
Covered	0.487 (0.019)	0.214 (0.013)
Uncovered	0.519 (0.008)	0.194 (0.006)
Covered-Uncovered Differences	-0.032 (0.021)	0.02 (0.014)
Unemployed-Employed Difference in Differences		-0.052 (0.025)

Notes: The first and second rows in each panel of the table report average job finding rates for unemployed and employed workers covered and not covered by unjust-dismissal doctrines. Covered workers are those living in adopting states after adoption and uncovered workers are those living in non-adopting states and in adopting states before adoption. The third and fourth rows in each panel report differences of the average job finding rates. Standard errors are in parenthesis.

Table 4: Job Finding Results

		Sample											
		Basic controls				Basic + main effects, and region x time				Basic + main effects, region x time and UI			
Exception	Regressor	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Implied Contract	Effect on Employed	0.086 (0.005)			0.088 (0.009)	-0.013 (0.011)			-0.029 (0.03)	-0.009 (0.011)			-0.026 (0.034)
	Unemp. Interaction	-0.175 (0.001)			-0.174 (0.009)	-0.074 (0.033)			-0.062 (0.004)	-0.075 (0.039)			-0.06 (0.005)
Public Policy	Effect on Employed		0.064 (0.005)		0.046 (0.01)		0.059 (0.011)		0.069 (0.014)		0.069 (0.013)		0.077 (0.012)
	Unemp. Interaction		-0.091 (0.001)		-0.033 (0.01)		-0.032 (0.001)		-0.019 (0.019)		-0.048 (0.006)		-0.035 (0.021)
Good Faith	Effect on Employed			0.008 (0.006)	-0.053 (0.002)			-0.001 (0.009)	0.021 (0.016)			-0.001 (0.009)	0.021 (0.018)
	Unemp. Interaction			-0.073 (0.001)	0.046 (0.001)			-0.122 (0.048)	-0.099 (0.041)			-0.122 (0.048)	-0.114 (0.054)
Unemp. Main Effect		0.429 (0.025)	0.409 (0.028)	0.379 (0.01)	0.436 (0.018)	0.481 (0.247)	0.476 (0.365)	0.516 (0.172)	0.501 (0.433)	0.524 (0.21)	0.522 (0.327)	0.516 (0.172)	0.549 (0.39)

Notes: The table reports marginal effects from regressions of re-employment probabilities on the interaction terms and main effects listed in the regressor column. The interaction terms capture the effects of the exceptions on unemployed relative to employed workers. All models include: age, education, number of children, tenure, wage, non-wage income, local unemployment rate, a manufacturing dummy, a union dummy, a white-collar dummy, and dummies for race, sex, and marital status. Columns (5)-(8) include year effects, state effects, year-unemployed interactions, state-unemployed interactions, and region-time interactions. Column (9)-(12) include, in addition, an unemployment benefit receipt dummy. Robust standard errors are reported in parenthesis.

Table 5: Job Finding Results in Union and Non-union Samples

Exception	Regressor	Sample							
		Non-Union				Union			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Implied Contract	Effect on Employed	0.089 (0.011)			0.083 (0.041)	-0.134 (0.018)			-0.173 (0.008)
	Unemployment Interaction	-0.195 (0.004)			-0.193 (0.002)	-0.127 (0.01)			-0.105 (0.026)
Public Policy	Effect on Employed		0.093 (0.03)		0.057 (0.022)		0.202 (0.151)		0.201 (0.008)
	Unemployment Interaction		-0.11 (0.003)		-0.041 (0.011)		-0.094 (0.036)		-0.057 (0.085)
Good Faith	Effect on Employed			-0.024 (0.025)	-0.076 (0.035)			-	-
	Unemployment Interaction			-0.078 (0.008)	0.053 (0.007)			-	-
Unemp. Main Effect		0.427 (0.03)	0.407 (0.035)	0.369 (0.024)	0.437 (0.04)	0.48 (0.014)	0.475 (0.05)	-	0.493 (0.11)
N		4,244	4,244	4,244	4,244	864	864	-	864

Notes: The table reports marginal effects from regressions of re-employment probabilities on the interaction terms and main effects listed in the regressor column. The interaction terms capture the effects of the exceptions on unemployed relative to employed workers. The models also include: age, education, number of children, tenure, hourly wage, non-wage income, local unemployment rate, a manufacturing dummy, a white-collar dummy, dummies for race, sex, and marital status, year effects, state effects, year-unemployed interactions, and state-unemployed interactions. The union/good faith sample is too small to allow estimation of the effects. Robust standard errors are reported in parenthesis.

Table 6: Job Finding Results by Reason for Separation

Regressor	Basic controls (1)	Basic + main effects (2)	Basic + main effects and UI (3)
Exception's Effect on Employed	-0.001 (0.009)	-0.397 (0.066)	-0.392 (0.055)
Exception x Unemployment Interaction	0.041 (0.009)	0.438 (0.137)	0.443 (0.122)
Exception x Dismissal Interaction	-0.024 (0.027)	-0.048 (0.021)	-0.05 (0.02)
Unemployment Main Effect	-0.399 (0.034)	0.325 (0.184)	0.324 (0.011)
Dismissal Main Effect	0.487 (0.002)	0.34 (0.112)	0.335 (0.124)
N	790	768	768

Notes: The table reports marginal effects from regressions of re-employment probabilities on the interaction terms and main effects listed in the regressor column. The models also include: age, education, number of children, tenure, hourly wage, non-wage income, local unemployment rate, a manufacturing dummy, a white-collar dummy, a union dummy, dummies for race, sex, and marital status, year effects, state effects, year-unemployed interactions, and state-unemployed interactions. Robust standard errors are reported in parenthesis.



# ITALY

## STRUCTURAL REFORMS: IMPACT ON GROWTH AND EMPLOYMENT

FEBRUARY 2015



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# Structural reforms in Italy: impact on growth and employment

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## Key findings

To improve Italy's long-term growth prospects, comprehensive structural reforms are needed to boost competitiveness and support job creation. Prime Minister Matteo Renzi's government has set out an ambitious structural reform agenda across many policy areas including product markets, labour markets, taxation, public administration and civil justice, among others. Some reforms have already been made, such as new provisions for labour contracts, revisions to unemployment benefits, some corporate tax reforms, and measures to improve administrative justice and anti-corruption policies. Others are under way but not complete, such as plans to improve active labour market policy, further administrative simplification and tax reforms. Still more are in the pipeline, such as further liberalisation and strengthening of competition, measures on education, public administration and criminal justice.

There has been an increased focus in Italy on rapid implementation: significant parts of the labour market reform were in place by the beginning of 2015. In addition, the backlog of subsidiary legislation from laws passed in 2012 and 2013 has been reduced significantly. Moreover, the government has also started to put great emphasis on changes in the political and institutional frameworks and judicial system to remove impediments to full implementation of reforms. Such institutional impediments in the past often deprived the economy of the full benefits of good reform projects due to a lack of their full implementation.

Drawing on the 2015 OECD Economic Survey of Italy, this paper provides a snapshot of the government's reform agenda. It also assesses the impact on productivity, employment and GDP of the reforms that have been introduced since 2012, which is estimated to have been significant. After five years, GDP will be 3.5% higher than would otherwise be the case in the absence of the reforms. This means that GDP will grow 0.7% faster per year on average over this period thanks to the reforms. The number of additional jobs created over that period is estimated at 340,000. In the following five years a further gain of similar magnitude can be expected. These estimates assume swift and full implementation of the reforms - delays, or less than full implementation, would reduce the gains.

- The *product market reforms* are estimated to boost GDP by around 1.5% after five years and 2.6% after ten years. This GDP increase is driven by higher productivity growth as lighter regulation encourages competition, which in turn speeds up the pace of convergence in productivity levels to the most technologically advanced economies. Lighter regulation also encourages firms to experiment with new ideas and technologies and improves facilitates the shift of resources from slow- to fast-growing sectors.
- The *labour market reforms* that the government is implementing as a result of the Jobs Act that was adopted in December 2014 are expected to boost GDP by 0.6% after five years and 1.2% after ten years. The positive GDP effect comes through higher employment, with 150,000 new jobs created after five years and 270,000 new jobs created after ten years. The reforms focus on four key areas: rationalising employment protection, expanding active labour market policy, making social protection more effective, and boosting female labour force participation.
- The *tax reforms* are expected to boost GDP by 0.7% after five years and 1.6% after ten years. The effect of the personal income tax cut for low-income earners will come through higher employment, which is estimated to increase by 180,000 jobs after five years and 380,000 jobs after ten years. The 10% cut in the tax on productive activities affecting businesses, the exclusion of workers' pay from the base of that tax, and the strengthening of the tax credit for hiring personnel with a PhD or engaged in R&D activities will affect GDP through higher productivity.
- The government is also making wide-ranging reforms to the *public administration* and the *judicial system*, which will boost GDP both directly by reducing administrative burdens on firms and indirectly by securing the timely and complete implementation of other reforms. Among the various reforms in this area, only the impact of the creation of single access points for foreign investors can be quantified in this paper. The reform is expected to increase the level of GDP by 0.6% after five years and 0.9% after ten years by easing the entry of foreign firms.

## Quantifying the effects of the reforms: details and analyses

After a long period of stagnation, Italy has started to undertake ambitious reforms to boost growth. This paper offers an estimate of the impact of improving the countries' product and labour market regulations, the structure of its tax system as well as its public administration and judicial system on productivity, employment and GDP. The assessment suggests that the reforms could increase the level of GDP by 3.4% within five years and by 6.3% within ten years (Table 1). At the 10-year horizon, about 40% of the effect is due to higher employment, while the remaining part is due to higher productivity. Details on the reforms considered are found in Annex 1.

**Table 1. Impact of reforms on the level of productivity, employment and GDP**

in percent

	Impact after five years			Impact after ten year2		
	GDP	Via employment growth	Via productivity growth	GDP	Via employment growth	Via productivity growth
Product market reform <sup>1</sup>	1.5		1.5	2.6		2.6
Labour market reform (Jobs Act) <sup>2</sup>	0.6	0.5	0.1	1.2	1.1	0.1
Tax reform	0.7	0.5	0.2	1.6	1.6	0.0
Public administration and judicial system reform	0.6		0.6	0.9		0.9
Total	3.4	1.0	2.4	6.3	2.7	3.6
<i>Average annual growth</i>	<i>0.7</i>	<i>0.2</i>	<i>0.5</i>	<i>0.6</i>	<i>0.3</i>	<i>0.4</i>

Notes:

1. OECD estimates for the impact of product market reform include the results of reforms from 2012 onwards. Approximately two thirds of the quoted impact are due to measures taken in 2012-13.
2. The impact of the labour market reform is based on a judgement, based on the Jobs Act Legge Delega (enabling law), although not all details are defined yet.
3. Reforms that are planned (and announced) for 2015 and 2016, or in 2014 but not yet legislated in detail, have not been included, with the exception of those under the Jobs Act as described in note 2.
4. The employment effects assume that all persons entering the labour market find work.

Source: OECD calculations.

The quantitative assessment is based on a previous work by the OECD for the G20 which evaluated the Comprehensive Growth Strategy by the Italian government. This previous work looked at the reforms announced and adopted in 2014. This time, the quantitative assessment broadens the scope so that it also includes:

- past reforms for which the current government is responsible in their implementation;
- additional measures which have been announced and adopted since the previous work for the G20 (among others, the 2015 budget as well as the Jobs Act enabling law and its application decrees).

The quantitative assessment therefore adopts the same methodology as in the previous work for the G20. It investigates the expected effects from each reform measure. First, each reform measure is evaluated in terms of quantifiable variables, including standard OECD indicators where necessary. These indicators are typically the Product Market Regulation (PMR) indicators and the Employment Protection Legislation (EPL) indicators. Then a series of equations relate each reform measure or packages thereof to their expected effects on productivity and/or employment. These effects are added up to produce the total effects.

The quantitative assessment primarily focuses on reform measures for which the estimated effects are relatively well-established and straightforward to be understood. It relies on existing OECD empirical studies of the links between structural policies and productivity or employment, and covers the following areas: *i*) product market reform; *ii*) labour market reform (employment protection legislation, unemployment benefits, active labour market policies, female labour force participation), and *iii*) tax reform. Reforms of the public administration and the justice system are taken into account where possible (for example, those which apparently improve the functioning of the product or labour market and are possible to be interpreted in terms of the standard OECD indicators).

### Product market reform

Reforming product market regulation (PMR) in a way to enhance competition can speed up the pace of convergence in productivity levels to the most technologically advanced economies. More competition encourages firms to pursue efficiency and invest in innovation and knowledge-based capital. Lowering barriers to entrepreneurship facilitates the entry of firms that experiment with new ideas and technologies. PMR reforms can also boost aggregate productivity by raising the capacity of the economy to allocate capital and labour resources to fast-growing sectors. Product market competition can also be good for jobs by encouraging the creation of new companies and the expansion of existing ones that can take advantage of new markets, products or processes.

Italy's product market does not seem to function in a competitive way, given the limited number of start-ups. The resource allocation mechanism is impaired, as it does not channel resources to the most productive firms. To tackle this issue, a number of reforms to the competition and regulatory frameworks were launched. Specifically, the government significantly extended the powers of the Antitrust Agency and established new independent regulators in transport sectors. In addition, regulatory restrictions in professional services and retail trade were eased, market access in the telecom sector was improved and the unbundling requirements in the gas sector were strengthened. Italy is also committed to implement reforms as part of the completion of the European Telecom Single Market, the Third EU Energy Package and the EU's commitment to open the railway market for competition. Together, the already implemented reforms and the reforms to which Italy is committed because of EU membership should boost productivity and GDP by around 1.5% within the first five years after the reforms and by another 1.1% within the following five years.

### Labour market reform

With the Jobs Act adopted in December 2014, the government has a mandate to introduce measures to rationalise employment protection, expand active labour market policy, make social protection more effective, and boost female labour force participation:<sup>1</sup>

- Less stringent *employment protection legislation* (EPL) promotes an efficient allocation of labour resources by making it easier for firms to respond quickly to changes in technology or product demand that require reallocation of staff or downsizing. Therefore, EPL reforms that reduce the costs of hiring and firing can support higher productivity. Indeed, stringent EPL has been found to weaken productivity in sectors where labour turnover is "naturally" high (Bassanini et al., 2009). To rebalance job protection, a standard contract with employment protection increasing with tenure was introduced in early 2015. This new arrangement implies quite radical changes for Italy and to avoid unwarranted disruption, it is applied only to new employment contracts ("grandfathering" existing rights). As part of the Jobs Act the government also introduced a new form of out-of-court procedure for dismissals, under which the employer pays the worker an indemnity equal to 1 monthly wage per year of service. The acceptance of this transaction prevents any further dispute by the worker. Both parties have a strong incentive to settle the dispute through this procedure, since the sum paid is not subject to social contribution or fiscal taxation.
- *Active labour market policies* (ALMPs) aim to improve the efficiency of the matching process in the labour market, reducing frictions in vacancy filling by assisting job seekers. ALMPs act on recruitment costs (through job counselling, placement services, etc.) as well as on after-tax wages (making work pay). Such

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1. The Jobs Act also foresees the introduction of a legal minimum wage, but no details have yet been announced.

measures encourage firms to open new vacancies and unemployed workers to accept jobs. The Jobs Act will strengthen ALMPs and create a National Employment Agency, which will be responsible for coordinating ALMP policy. So far, only parts of the reform have been legislated.

- An efficient *social benefit system* is important so that displaced workers are protected against poverty and given facilities to help finding new jobs, while avoiding pervasive disincentives for labour supply. In Italy, the unemployment benefit system has been very generous for certain workers, notably those in the industrial sector, while other workers have had little cover. As part of the Jobs Act the coverage of unemployment benefits was extended, bringing Italy closer to a “flexicurity” approach. Moreover, the “Assicurazione Sociale per l’Impiego” (ASpl) and mini-ASpl which were introduced in 2012 were integrated, thus harmonising their different eligibility requirements and durations. The new legislation also introduced conditionality for unemployment benefits, requiring recipients to participate in activating measures proposed by the employment service, and reforms the social assistance provided to vulnerable people.
- The *female labour force participation* rate has been increasing steadily, due to the cohort effect reflecting higher educational attainment of the current generation, and is expected to continue doing so. However, its level still remains well below the OECD average. Encouraging greater participation is very important for Italy, since the working age population will soon begin to diminish due to demographic factors, while immigration is expected to have a very limited influence over the long run. Family-friendly policies and working conditions which enable fathers and mothers to balance their working hours and their family responsibilities facilitate women’s labour force participation or longer working hours. To encourage female labour force participation, the Italian government is planning to reshape tax deductions for dependent spouses, reform maternity allowances and improve the availability of care facilities. Moreover, it has introduced a tax credit for low- and medium-income families with children.

Many of the above listed elements of the Jobs Act can be quantified in terms of their impact on productivity, employment and GDP. This includes all EPL reforms with the exception of the new out-of court settlement procedure, all ALMPs reforms, the strengthening of the link between unemployment benefits and individual job-search efforts, and all measures to foster female labour force participation. Together, these reforms will boost GDP by 0.6% in the first five years after the reform. In the following five years an effect of similar magnitude is expected, so that the total GDP effect after ten years amounts to around 1.2%. The majority of this effect comes through higher employment. The Jobs Act is estimated to create around 150,000 new jobs in the first five years after the reform and another 120,000 jobs in the following five years.<sup>2</sup> This assumes that the ALMP that have not been legislated so far and the reforms to strengthen the participation of women will be legislated in due course.

### Tax reform

High taxes on labour income depress labour supply and can reduce firms’ labour demand by driving up the cost of labour (due to high employers’ contributions or payroll taxes). Such detrimental effects are stronger for young and low-skilled workers facing foremost labour demand-side obstacles, and second earners and lone parents often facing high disincentives for full-time labour participation. Therefore, reforms that reduce the labour tax wedge can increase employment and also reduce labour informality (Bassanini and Duval, 2006). As part of its reform agenda, the government cut the personal income tax for low-income earners. The reform will create around 180,000 jobs within the first five years of the reform and additional 200,000 jobs within the next five years. The greater labour supply will boost GDP by 0.3% within the first five years and by another 0.9% within the following five years.<sup>3</sup>

Tax reforms can impact economic growth also via private investment and productivity (Arnold et al., 2011; Bouis et al., 2012). A more growth-friendly tax system can be achieved by shifting the tax burden away from

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2. The contribution of employment growth to GDP growth is disproportionately larger at the 10-year horizon than at the 5-year horizon despite the similar pace of employment growth because the 10-year effect assumes that the capital stock increases by as much as employment to recover the pre-reform level of the return to capital.

3. The much larger contribution of employment growth to GDP growth at the 10-year horizon relative to the 5-year horizon is again due to the capital stock adjustment that feeds through only in the long run.

direct income toward consumption, immovable property and the environment. In this spirit, the Italian government cut the regional tax on productive activities (IRAP) affecting businesses by 10% in 2014, from 3.9% to 3.5%. In addition, the 2014 Budget Law strengthened the tax credit for hiring personnel with high skills to facilitate the employment of persons with a PhD or engaged in R&D activities and extended the tax credit for investments in R&D. The government is also working to pass a law (“delega fiscale”) aimed at reforming the cadastre and defining a more equitable, transparent, simplified and growth-oriented tax system, while ensuring stability and legal certainty. The measures to modernize and make the tax code more growth friendly are needed complements to the crowding in effect from the spending review. Together, these measures are estimated to raise the levels of productivity and GDP by 0.4%, with the full impact of the reforms seen already after five years. This assumes that also the “delega fiscal” will be rapidly and fully legislated.

### **Reform of the public administration and the judicial system**

Important steps have been taken to improve the efficiency of the judicial system. The government has modified the application of the statute of limitations to reduce the incentive to prevarication and took measures to gain economies of scope and scale through the amalgamation of small courts, thus allowing some specialisation by judges. Other measures already legislated include the strengthening of mechanism of alternative dispute resolution and making greater use of ICT to simplify judicial processes and make them more efficient. The government is also planning to establish specialised business courts.

The government is also planning to reform the public administration, progressively lowering the mean working age of civil servants, launching a new system for public management and a national plan for workers’ mobility and adopting measures to enhance integrity. In addition, the public administration is to be reorganized to achieve cost savings, the efficiency of public procurement is to be strengthened, and governance is to be simplified and improved to attract more foreign direct investment.

As the quantitative assessment only considers reforms which directly impact productivity and/or employment, the coverage of reforms related to the efficiency in public administration and the justice system is limited. The only reform that is taken into account is the creation of single access points for foreign investors, which increases productivity by facilitating the dialogue with the public administration in the preparation of investment solutions as well as by guaranteeing the legality of investment-related regulatory practices at all stages of the investment process and the stability of contracts. Assuming that that the measure is fully implemented in due course, it will boost GDP by almost 0.6% within the five years of the reform and by an additional 0.3% within the following five years.

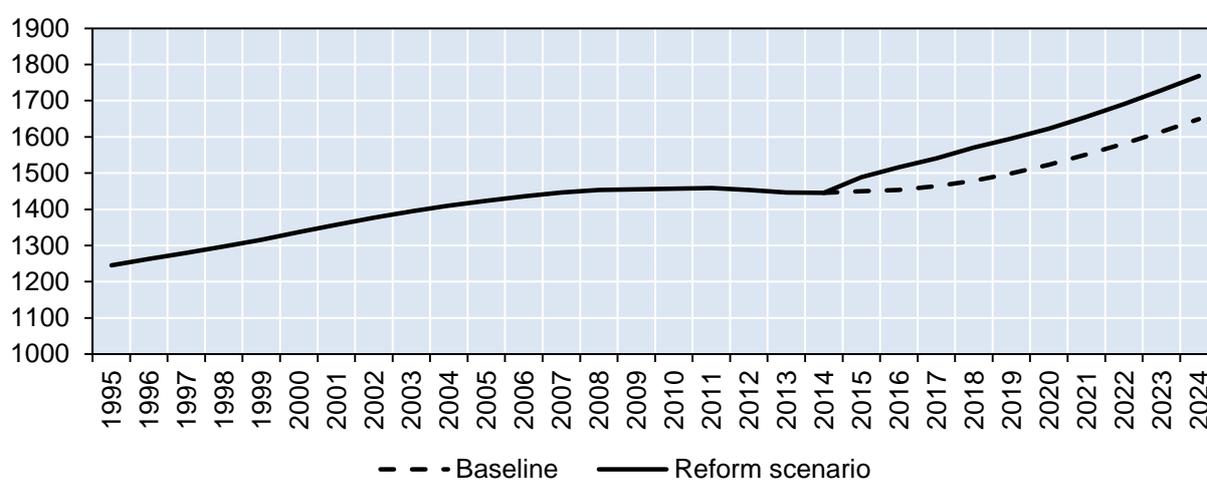
## The impact of reforms on the public debt-to-GDP ratio

The reform package can be considered in an integrated macroeconomic framework, using the OECD Economic Department's long-term baseline model. This framework allows computing the trajectories of GDP, public finances and the current account balance in a consistent way, while taking into account the reform measures jointly with other macroeconomic forces.

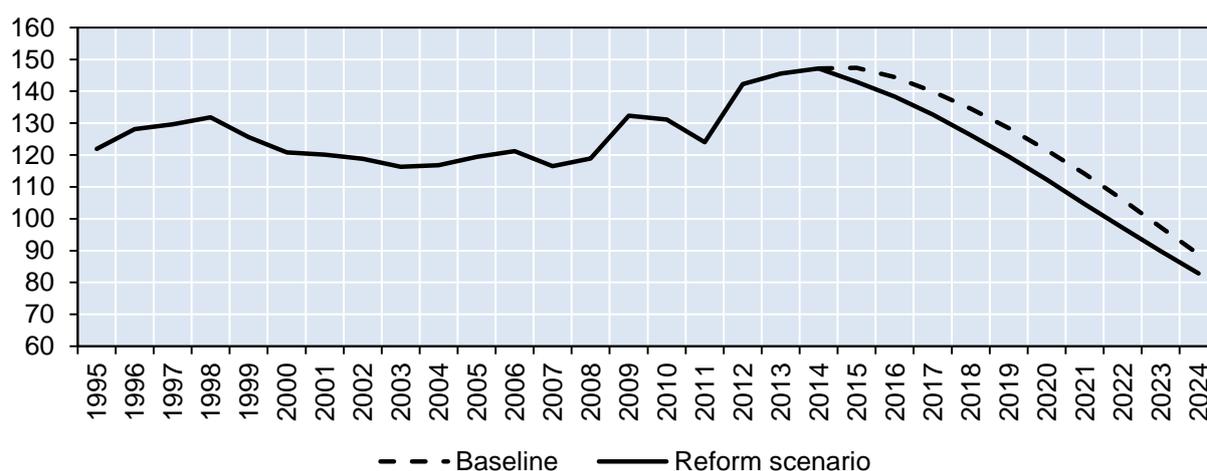
In association with higher growth rates, the reforms will lower the debt-to-GDP ratio. The path of the debt-to-GDP ratio is now lower compared with the baseline scenario in each period, with the difference narrower as the 60% target is being reached. This difference arises to a large extent from the employment side. The result is underpinned by a long-term equality between government and private sector wages, as well as program expenditures that are linked to economic growth through indexation on wage increases (for details, see Chapter 4 in OECD, 2010).

**Figure 1. The reforms will accelerate the reduction in the debt-to-GDP ratio**

A. Potential GDP in billion EUR (constant 2005 prices)



B. Debt-to-GDP ratio in %



## Annex 1. Reforms taken into account in the quantification exercise

Reform area	Reform content
Product market reforms	
Antitrust Agency	The powers of the Antitrust Agency (AGCM) have been significantly extended. It can now appeal through the regional administrative court (TAR) against the actions of any public administration at the national, regional or local level violating the principles of competition. To raise the incentives of local authorities to award services through public tender, exclusive contracts for local public service provision in municipalities with more than ten 000 inhabitants have been subjected to a mandatory opinion by the AGCM regarding the existence of suitable and sufficient reasons for assigning such exclusive rights.
Regulatory oversight	In transport, the Cresci Italia law from March 2012 legislated to establish a new independent regulatory authority, to be responsible for highways, airports, ports, taxis and railways both at the national and local level. The surveillance of the water and postal sectors has been assigned to the Energy and Communication Authorities, respectively.
Telecom sector	The Communications Authority (AGCOM) approved the break-up of the fixed telecommunications infrastructure owned by Telecom, in order to ensure to all operators access to the network at non-discriminatory rates.
Gas sector	The further unbundling of the gas network operator (SNAM) from the incumbent gas operator (ENI) should create more effective competition and transparency in the market for natural gas.
Professional services	Some restrictions to professional services have been reduced. For example, standard pricing has been eliminated and it has become easier for young people to begin practising, by allowing them to complete part of the compulsory practical training in parallel with university education. Pharmaceutical distribution services have been enhanced through an increase in the number of pharmacies (one per 3 300 inhabitants), and allowing the sale of certain pharmaceuticals outside pharmacies. On the other hand, the period within which a person inheriting a pharmacy, but who is not enrolled in the profession's register, must sell the property was shortened from 2 years to 6 months, providing members of the register with greater leverage in sales negotiations.
Retail trade	In retail trade, the Salva Italia law has extended the freedom of opening hours to all shops, not only those located in tourist resorts or artistic cities, and has reduced unjustified restrictions on the exercise of a business activity, such as minimum distances between commercial outlets.  Fuel distribution at the retail level has been substantially deregulated by allowing petrol stations to source part of their supply from producers other than their mother company, removing limitations to self-service at stations outside cities and to locating near supermarkets, and expanding the range of articles that are allowed to be sold at petrol stations.
EU commitment on Single Telecom Market	A legislative package for the completion of the European Telecom Single Market was voted by the European Parliament in April 2014 and has to be approved by the EU Council. The proposed package would strengthen network neutrality rules across borders and cut international roaming charges in the EU. Following an agreement reached with the EP in February 2014, the Council adopted the Directive on broadband cost reduction on 8 May. EU Member States must now adopt national provisions to comply with the new Directive by 1 January 2016 and they must apply the new measures from 1 July 2016.

EU commitment in the energy sector	In the energy sector the priority for the coming years should be the completion of the energy internal market through the transposition and implementation of the Third Energy Package, which should be achieved by the end of 2014. Its major elements concern the unbundling of networks, the strengthening of the independence and power of national regulators, and the improvement of the functioning of retail markets. Fees for the purchase of natural gas have also been made more competitive, and the Electronic Markets Operator (GME) is developing a platform for the logistics market for oil and mineral oils to bolster competition in the oil industry.
EU commitment in rail transport	In transport, the main priority is the opening of the railway market for competition through, among other things, the separation between infrastructure and services and open procedures for public service obligations. These issues are addressed by the Fourth Railway package proposed by the European Commission. In June 2014, the Council reached political agreement on the draft directives on the interoperability and safety of European railways and the draft regulation on the European Railway Agency. Together, these three legislative acts make up the technical pillar of the Fourth Railway package. The rules regarding the fees for access to the railway network have changed so as to guarantee to all competitors non-discriminatory access to the market.
<b>Labour markets reforms</b>	
Active Labour Market Policies	The Jobs Act strengthens employment services and active policies by: a) establishing a National Employment Agency for the integrated management of active and passive labour policies; b) strengthening and enhancing public-private partnerships; c) ensuring a proper division of labour between the national level, in charge of defining the basic level of assistance, and the local authorities, in charge of planning active labour market policies; d) ensuring the active involvement of job seekers; e) improving the IT system for managing and monitoring purposes.
Unemployment Benefits	Taking over the previous reform in 2012, the Jobs Act ensures the unification of the standard unemployment benefit and some specific benefits ( <i>Indennità di Mobilità</i> for collective dismissal, for example). It will also phase out other specific benefits (for example, <i>Cassa Integrazione Straordinaria</i> , for those who work in firms facing crisis and/or restructuring in the industry sector or other designated sectors, whose replacement ratio and duration have been more generous than the standard unemployment benefit).
Employment Protection Legislation	<p>For fixed-term contracts lasting up to 3 years (instead of 1 year before the reform), employers no longer need to specify the reason of the termination of the contract.</p> <p>For businesses employing more than a certain number of employees, the maximum share of the total workforce that can be subject to this contract is 20 per cent; for businesses employing less than a certain number of employees there is no limit to the use of this contract typology. The ability to modify the quantitative limit of 20 per cent and the possibility of deviating from the 20 per cent threshold for reasons connected with replacement and seasonality are left to collective bargaining. The possibility to extend the duration of the contract period within the limit of 36 months was also extended from one to eight times.</p> <p>A new standard employment contract was introduced, implying less rigid dismissal protection than the previous open-ended contract. This new standard contract limits further the possibility of reinstatement of workers following unfair dismissal and excludes this possibility for the case of redundancy (dismissal for objective reasons "motivo oggettivo"). Instead, workers unfairly dismissed for objective reasons receive monetary compensation. This monetary compensation increases with tenure: equal to 2 monthly wages per year of service (a minimum amount equivalent to 2 months and a maximum amount equivalent to 24 monthly wages).</p>

Labour force participation	The Jobs Act aims at: a) introducing a universal maternity allowance (guaranteeing the right to mothers working under a non-standard contract to benefit from a maternity allowance even in the event of non-payment of contributions by the employer); b) introducing a tax credit for low- and medium-income families with little children; c) supporting collective agreements designed to facilitate flexible working conditions; d) facilitating an integrated provision of services to childhood by companies within the public-private system of personal care services.
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#### Tax Reforms

Labour tax wedge	The government introduced a EUR ten billion overall tax reduction benefitting low-income dependent workers with an annual labour income of less than EUR 26000. A lump sum tax reduction equivalent to EUR 80 per month is paid on incomes up to EUR 24000, and gradually phased out as labour income attains EUR 26000. This tax reduction is estimated to benefit about ten million employees (those with a take-home pay of less than EUR 1500 per month). The government financed this measure broadly in a finance-neutral way. This measure is extended to the year 2015 and will become permanent.
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Tax structure	<p>The tax on productive activities (IRAP) (affecting businesses) was cut by ten percent.</p> <p>The 2015 Budget Law a) strengthened the tax credit for hiring personnel with high skills and b) extended the tax credit for investments in R&amp;D.</p> <p>The government is also working to pass a law (“delega fiscale”) aimed at reforming the cadastre and defining a more equitable, transparent, simplified and growth-oriented tax system, while ensuring stability and legal certainty.</p>
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#### Reform of the Public Administration and Judicial System

	The administrative burden will be reduced through the creation of a single access point to facilitate entry of foreign investors: facilitating the dialogue with the public administration in the preparation of investment solutions, and guaranteeing the legality of investment-related regulatory practices at all stages of the investment process and the stability of contracts.
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# Job Turnover and Policy Evaluation: A General Equilibrium Analysis

Hugo Hopenhayn and Richard Rogerson

JPE 1993

# Motivation



## Motivation

The Model  
Timing of  
decisions  
The firm's decision  
problem  
Preferences and  
Endowments  
Equilibrium  
Equilibrium  
definition

- Study the implications of government policies that make it costly for firms to adjust their employment level.
- Characterize the stationary equilibrium of an economy with firing costs.
- Main result: It is costly to distort job creation/destruction process.

# The Model



Motivation

**The Model**

Timing of  
decisions

The firm's decision  
problem

Preferences and  
Endowments

Equilibrium

Equilibrium  
definition

- $\pi_t = p_t f(n_t, s_t) - n_t - p_t c_f - g(n_t, n_{t-1})$
- $s$  follows Markov process  $F(s'|s)$
- $g(n_t, n_{t-1}) = \tau \max(0, n_{t-1} - n_t)$
- All the rest is as in Hopenhayn (92)

# Timing of decisions

Motivation

The Model

Timing of  
decisions

The firm's decision  
problem

Preferences and  
Endowments

Equilibrium

Equilibrium  
definition

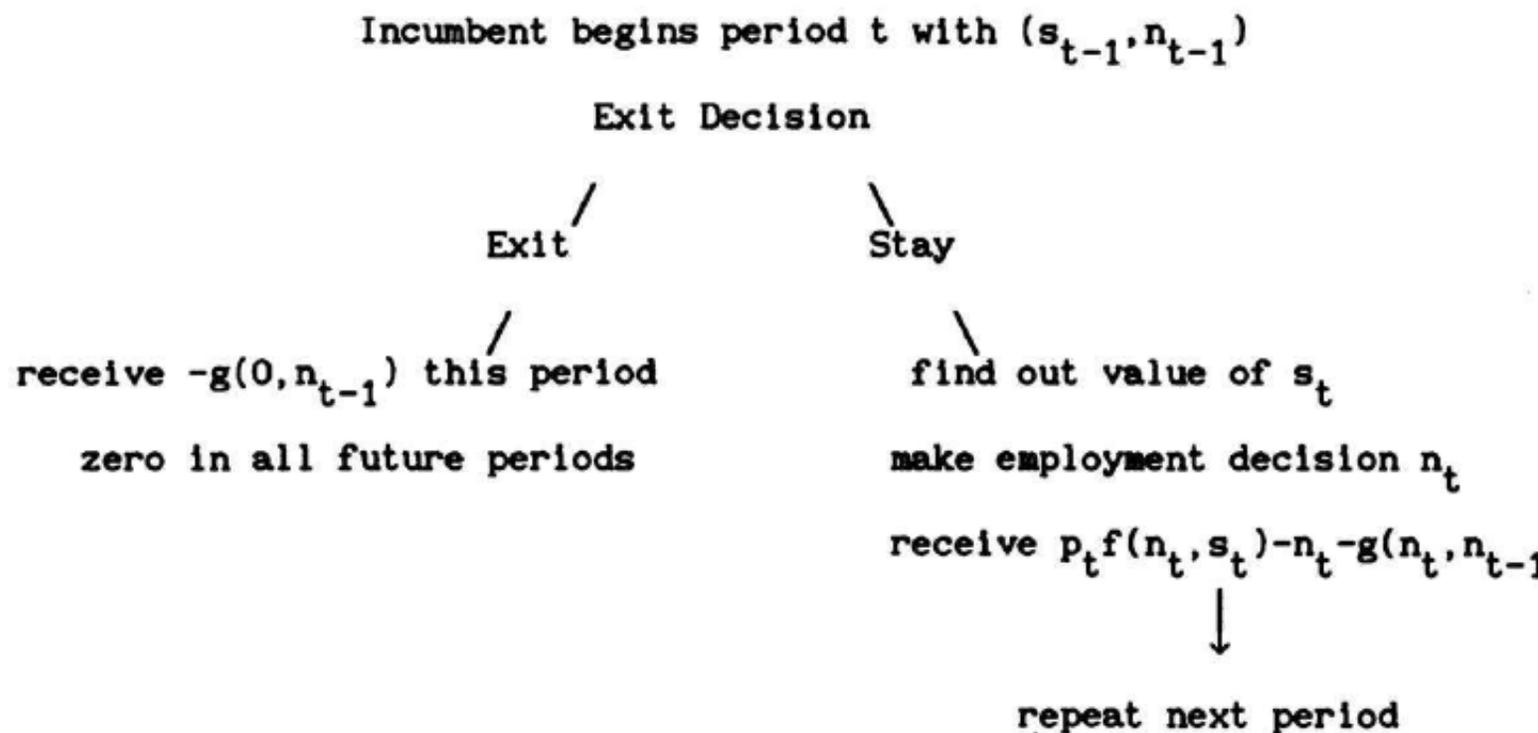


FIG. 1.—Timing of decisions

# The firm's decision problem



- Motivation
- The Model
- Timing of decisions
- The firm's decision problem**
- Preferences and Endowments
- Equilibrium
- Equilibrium definition

$$W(s, n; p) = \max_{n' \geq 0} \{p_t f(n', s) - n' - pc_f - g(n', n) + \quad (1)$$

$$+ \beta \max[E_s W(s', n'; p), -g(0, n')]\} \quad (2)$$

The problem for the potential entrants is simply given by:

$$W^e(p) = \int W(s, 0; p) dv(s) \leq c_e \quad (3)$$

- Let  $(s, n)$  be the state of an individual firm, then the state of the economy is defined as the distribution of the state variables for all individual firms  $\mu(s, n)$
- The transition from  $\mu$  to  $\mu'$  is  $\mu' = T(\mu, M; p)$ . The operator  $T$  has a fixed point:  $\mu^* = T(\mu^*, M; p)$

# Preferences and Endowments



Motivation  
 The Model  
 Timing of  
 decisions  
 The firm's decision  
 problem

Preferences and  
 Endowments

Equilibrium  
 Equilibrium  
 definition

- There is a continuous of identical agents with utility function:

$$\sum_{t=1}^{\infty} \beta^t [u(c_t) - \kappa(n_t)] \quad (4)$$

- Labor supply  $\in \{0, 1\} \Rightarrow$  individual choose employment lotteries  $\Rightarrow$  representative agent with preferences  $\sum_{t=1}^{\infty} \beta^t [u(c_t) - aN_t]$
- The problem of the household is:

$$\max u(c) - aN \quad s.t. \quad pc \leq N + \Pi + R \quad (5)$$

- $\Pi$  are the profits equally distributed among households and  $R$  is the lump-sum transfer from taxation of job destruction
- $L^s(p, \Pi + R)$  is the labor supply. It is assumed that the income effect on labor supply is negative

# Equilibrium



- Motivation
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- Equilibrium**
- Equilibrium definition

$$L^d(\mu, M; p) = \int N(s, n; p) d\mu(s, n) + M \int N(s, 0; p) d\nu(s)$$

$$Y(\mu, M; p) = \int [f(N(s, n; p), s) - c_f] d\mu(s, n) + \\ + M \int f(N(s, 0; p), s) d\nu(s)$$

$$\Pi(\mu, M; p) = pY(\mu, M; p) - L^d(\mu, M; p) - R(\mu, M; p) - Mpc_e$$

$$R(s, n; p) = [1 - X(s, n; p)] \int g(N(s', n; p), n) dF(s' | s) \\ + X(s, n; p) g(0, n)$$

# Equilibrium definition



- Motivation
- The Model
- Timing of decisions
- The firm's decision problem
- Preferences and Endowments
- Equilibrium
- Equilibrium definition**

A *stationary equilibrium* consists of an output price  $p$ , a mass of entrants  $M$ , a measure of incumbent firms  $\mu$  decision rules  $N(s, n; p)$  and  $X(s, n; p)$  and labor supply function for households  $L^s(p, W)$  such that:

1. Decision rules are optimal for firms and households
2.  $L^d(\mu, M, p) = L^s(p, \Pi(\mu, M, p) + R(\mu, M, p))$
3.  $\mu = T(\mu, M; p)$
4.  $W^e(p) \leq pc_e$  with equality if  $M > 0$ .

# Parametrization

- $f(n, s) = sn^\theta$  with  $\theta \in [0, 1]$
- $g(n_t, n_{t-1}) = 0$  in the benchmark model  
otherwise  $g(n_t, n_{t-1}) = \tau \max(0, n_{t-1} - n_t)$
- $\log(s_t) = a + \rho \log(s_{t-1}) + \varepsilon_t$  with  $\varepsilon \sim N(0, \sigma_\varepsilon^2)$   $a \geq 0$  and  $\rho \in [0, 1)$
- $u(c) = \log(c)$ ,  $\kappa(n) = An$  with  $A > 0$
- in the benchmark model the problem of the firm is static and it implies:

$$\log(n_t) = \frac{1 - \rho}{1 - \theta} \left( \log \theta + \log \rho + \frac{a}{1 - \rho} \right) + \rho \log(n_{t-1}) + \left( \frac{1}{1 - \theta} \right) \varepsilon_t$$

## Calibration with 5 years as a unit of time using LRD

- $p^* = 1 \Rightarrow c_e$  is pinned down by the entry condition
- $\theta = 0.64$ ,  $\beta = 0.8$  and  $A$  s.t.  $\frac{\text{employment}}{\text{population}} = 0.6$
- $\rho$  and  $\sigma_\varepsilon^2$  are recovered from the regression of  $\log(n_t)$  on a constant and  $\log(n_{t-1})$
- $c_f$  and  $a$  are chosen to match the cross-sectional average of log employment and the 5-years exit rate
- The distribution of  $v$  is chosen to match the actual size distribution of firms aged 0-6 years in their first and second periods

# LRD Statistics

## A. ESTIMATES DERIVED FROM THE LRD

---

Serial correlation in log employment (5-year interval, survivors)	.93
Variance in growth rates (log difference, 5-year interval, survivors)	.53
Mean employment	61.7
Exit rate (5-year interval)	37%

---

## B. SIZE DISTRIBUTION FOR FIRMS AGED 0–6 YEARS

---

Employees	Share of Total Firms
1–19	.74
20–99	.18
100–499	.08
500+	.01

---

# Statistics from Benchmark Model

## A. SUMMARY STATISTICS FOR BENCHMARK MODEL

Average firm size	61.2
Co-worker mean	747
Variance of growth rates (survivors)	.55
Serial correlation in log $n$ (survivors)	.92
Exit rate of firms	.39
Turnover rate of jobs	.30
Fraction of hiring by new firms	.15
Average size of new firm	7.5
Average size of existing firm	4.9

## B. SIZE DISTRIBUTION

	1–19	20–99	100–499	500+
Firms	.52	.37	.10	.01

# The effect of a tax on job destruction

EFFECT OF CHANGES IN  $\tau$  (Benchmark Model)

	$\tau = 0$	$\tau = .1$	$\tau = .2$
Price	1.00	1.026	1.048
Consumption (output)	100	97.5	95.4
Average productivity	100	99.2	97.9
Total employment	100	98.3	97.5
Utility-adjusted consumption	100	98.7	97.2
Average firm size	61.2	61.8	65.1
Layoff costs/wage bill	0	.026	.044
Job turnover rate	.30	.26	.22
Serial correlation in $\log(n)$	.92	.94	.94
Variance in growth rates	.55	.45	.39

- A tax on job destruction reduces long-run employment, reduces average productivity and, as a consequence of this reduction, produces welfare losses

EFFECT OF  $\tau$  ON DECISION RULES

log $s$	$\tau = .1$		$\tau = .2$	
	$n_l$	$n_u$	$n_l$	$n_u$
1.83	1.36	1.78	1.18	1.98
4.75	21.7	26.7	21.0	32.8
10.5	194	238	181	282
19.9	1,110	1,410	1,036	1,617
27.3	2,610	3,316	2,522	3,935

TABLE 5

ABSOLUTE DEVIATIONS FROM  $MPL = 1/p$ 

SIZE OF DEVIATION (%)	FRACTION OF FIRMS WITHIN INTERVAL	
	$\tau = .1$	$\tau = .2$
0-3	.30	.00
3-5	.45	.12
5-10	.15	.78
10-15	.00	.05
>15	.00	.05

## Key lessons for labour market reforms: evidence from OECD countries' experiences

Jørgen Elmeskov, John P. Martin, and  
Stefano Scarpetta\*

### Summary

■ Since 1992, the OECD has been intensively researching into the causes and consequences of high, persistent unemployment and effective remedies to tackle it. In particular, since the *Jobs Study* was published in 1994, the OECD has elaborated detailed policy recommendations for each of its member countries and closely monitored their progress (or lack of it) in implementing these recommendations. This process identified six countries that have succeeded in reducing unemployment significantly in the 1990s, together with a few other countries that have maintained unemployment at relatively low levels.

The purpose of this paper is to distil the lessons for labour market reforms from the *successes* and *failures*. It begins by discussing the structural unemployment indicator that the OECD has used to identify the successful countries. This is followed by a review of the cross-country determinants of structural unemployment that focuses on the role of labour market policies and certain institutional factors. One novelty is the specific attention paid to potential interactions between labour market policies and institutional features of the collective bargaining system. The paper also highlights several key lessons for labour market reforms drawing on recent OECD research. In particular, it discusses the role played by labour market insiders in the process of reform. It considers the way in which concerns about the equity effects of labour market reforms have played a role in shaping policies. Finally, it discusses the role of crises as a potential catalyst for needed reforms. ■

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## Key lessons for labour market reforms: evidence from OECD countries' experiences

Jørgen Elmeskov, John P. Martin and Stefano Scarpetta\*

High and persistent unemployment has been a major blot on the economic and social record of most OECD countries during the past two decades or more. In 1992, OECD ministers gave the organisation a mandate to analyse the causes and consequences of high and persistent unemployment and propose effective remedies to tackle the problem. The first fruits of this work, published in 1994 under the title *The OECD Jobs Study*, included a list of more than 60 detailed policy recommendations backed by two volumes of research; see OECD (1994a, 1994b). Ministers then mandated the organisation to continue its analytical work in certain areas. They also asked the organisation to flesh out detailed policy recommendations for each OECD country (considering each country's historical, institutional and political contexts) and to monitor progress in the implementation of these recommendations and their impacts on labour market performance.<sup>1</sup>

The OECD work since 1994 has produced a series of additional publications; see OECD (1996a, 1996b, 1997a). This work culminated in a major report in 1997, *Implementing the OECD Jobs Strategy: Member Countries' Experience*.<sup>2</sup> And it enabled the organisation to identify several country success stories and failures in terms of implementing OECD recommendations and the resulting labour market

\* We acknowledge helpful comments from Lars Calmfors, the referee, and participants at the Stockholm conference. We are grateful to Martine Levasseur for statistical assistance and to Léa Duboscq for secretarial assistance. The views expressed in this paper are our own and should not be held to represent those of the OECD or its member governments.

<sup>1</sup> The results of this monitoring exercise were published in OECD Economic Surveys of individual countries.

<sup>2</sup> OECD (1998a) presents a short update of the 1997 report.

outcomes. In assessing needs for reform, the work relied heavily on the econometric analysis in Scarpetta (1996) that quantified the role of a range of labour market policies and institutional factors in explaining differences in unemployment rates across OECD countries.

The aim of this paper is to distil the main lessons for labour market reforms from the successes and failures revealed by recent OECD research. In short, the paper tries to answer this question: Why did a few OECD countries succeed in the task of significantly reducing structural unemployment during the past decade while most have failed so far?

The paper has three main sections. Section 1 presents estimates of the structural unemployment rate indicator that the OECD used to identify successes and failures and briefly discusses its pros and cons. This is followed by a review of the main determinants of unemployment rates across countries, which is essentially an update and extension of the cross-country results in Scarpetta (1996). In particular, it focuses on possible interactions between labour market policies and institutional features of the collective bargaining system. Section 3 highlights some key lessons for labour market reforms revealed by OECD research. The final section contains concluding remarks.

## **1. Identification of country successes and failures**

### **1.1. Structural unemployment rates**

Because the ultimate goal of policy is to reduce high and persistent unemployment, it is natural to use an unemployment-rate measure as the criterion to distinguish success from failure. To abstract from business-cycle effects, the OECD opted for a measure of the structural or equilibrium unemployment rate as its criterion. Table 1 presents estimates of the *non-accelerating wage rate of unemployment* (NAWRU) that indicate the possible level and evolution of non-cyclical unemployment in OECD countries over the past decade; see Appendix A.

Estimates of the NAWRU are used to split the OECD countries into three groups consisting of countries where structural unemployment has: (1) increased during the 1990s; (2) shown little change; and (3) decreased. (A change in the structural unemployment rate between 1990 and 1997 is considered significant, and hence determines which of the three groups a country is assigned to, if it exceeds one standard deviation.)

**Table 1. Structural unemployment in the OECD countries as a per cent of the total labour force<sup>a</sup>***In the 1990s, the structural unemployment rate has...*

<i>...increased in</i>	1986	1990	1997
Finland	5.5	7.0	12.8
Sweden	2.1	3.2	6.7
Germany	7.3	6.9	9.6
Iceland	0.8	1.5	4.0
Switzerland	0.7	1.3	3.0
Greece	7.8	8.2	9.8
Italy	8.4	9.7	10.6
France	8.9	9.3	10.2
Belgium	11.7	11.0	11.6
Austria	4.1	4.9	5.4
<i>...remained fairly stable in</i>			
Japan	2.5	2.5	2.8
Norway	3.1	4.2	4.5
Spain	19.1	19.8	19.9
Portugal	7.8	5.9	5.8
US	6.2	5.8	5.6
Canada	8.3	9.0	8.5
<i>...decreased in</i>			
Denmark	8.6	9.2	8.6
Australia	7.9	8.3	7.5
New Zealand	4.7	7.3	6.0
UK	9.5	8.5	7.2
Netherlands	8.0	7.0	5.5
Ireland	14.6	14.6	11.0
OECD structural unemployment rate <sup>b</sup>	6.9	6.8	7.1
OECD actual unemployment rate <sup>b</sup>	7.7	6.0	7.5

*Notes:*

<sup>a</sup> Structural unemployment data are based on estimates of the NAWRU made for the *OECD Economic Outlook*, 63, 1998. A change is considered significant (in absolute terms) if it exceeds one standard deviation. The latter was calculated for each series and country during the 1986-97 period.

<sup>b</sup> Weighted averages of the countries reported in the table.

*Source:* OECD Secretariat.

These estimates suggest that structural unemployment rates significantly increased in the 1990s in 10 countries, including Sweden, remained stable in another six, and significantly declined in the remaining six countries. This latter group, designated the success stories for the purposes of this paper, consists of Australia, Denmark, Ire-

land, the Netherlands, New Zealand, and the UK. Note that the success stories are not confined to English-speaking countries but also include two continental European countries: Denmark and the Netherlands. Several countries in the second group in Table 1 also managed to maintain structural unemployment rates at relatively low levels. This group includes Japan, Norway, Portugal, and the US. OECD (1997b) argues that some of these countries managed to maintain low structural unemployment because their policies in important respects followed the main thrust in the *Jobs Strategy*, though with clear differences of emphasis among countries. Also note that some of the countries in the first group, e.g., Austria, Iceland, and Switzerland, while experiencing rising structural unemployment in the 1990s, managed to maintain relatively low levels of unemployment.

### **1.2. The pros and cons of using estimates of structural unemployment rates as an indicator of success or failure**

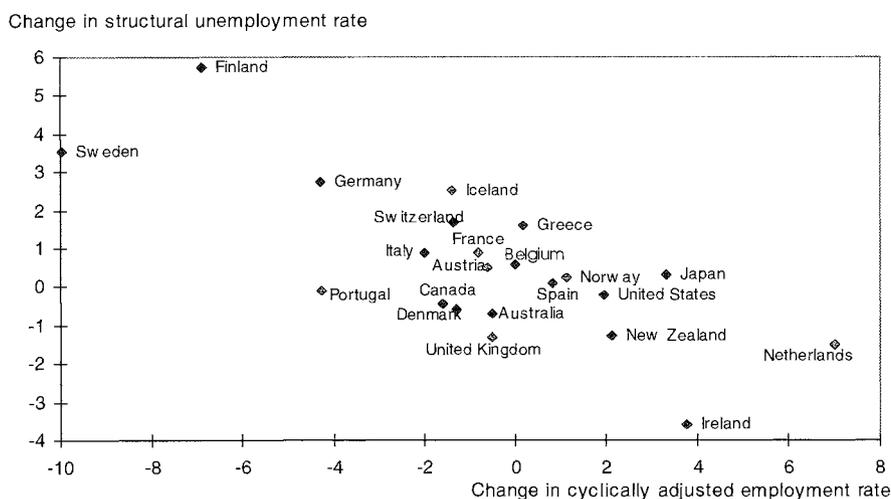
Because by definition the structural unemployment rate is an unobservable variable, serious questions can be raised about its use in this way to classify cross-country performance. And many economists question the analytical usefulness of the concept itself—witness the different views expressed on the concept in a symposium in the *Journal of Economic Perspectives*, Winter 1997.

Because differing views on the use of the concept for analytical and empirical purposes are well known, we do not rehearse the case again. All we are saying is that the OECD Secretariat has found the concept to be a useful one in its analyses of the unemployment problem, and the relevant OECD bodies that oversee work on implementing the OECD *Jobs Strategy* largely share this view.<sup>3</sup> Even if one accepts that the concept is a useful analytical device, there still remains the issue of deriving satisfactory empirical proxies for it. The previously cited OECD work has opted to proxy the structural unemployment rate by estimates of the NAWRU. Of course these time-varying estimates of NAWRUs are somewhat fragile, but similar concepts based on the unemployment rate that is associated with some average vacancy rate or some average capacity-utilisation rate, tend to give broadly similar numerical estimates (Elmeskov, 1993). The OECD NAWRU estimates are broadly aligned with those of other

<sup>3</sup> Here, it is interesting to note the trenchant defence of the concept by Stiglitz (1997). He was formerly chairman of the OECD's Economic Policy Committee.

studies.<sup>4</sup> We also examined the correlations between changes in estimated structural unemployment rates during the 1990-97 period with corresponding movements in a range of *observable* labour market indicators, such as long-term unemployment, unemployment rates for low-skilled workers, and employment rates (OECD, 1997b). In all cases, relatively high correlation exists between movements in the different series. Figure 1 illustrates the correlation between changes in structural unemployment and changes in the cyclically adjusted employment rate.

**Figure 1. Change in the structural unemployment rate plotted against the change in the employment rate, 1990-97**



*Note:* Correlation coefficient = -0.7. t-statistic = -5.0. The cyclically adjusted employment rate was estimated by regressing the actual employment/population ratio against an estimate of the output gap based on the proportional difference between actual and trend output. The latter has been estimated using a Hodrick-Prescott filter.

<sup>4</sup> See the set of country studies on "The NAIRU: Concept, Measurement and Policy Implications" in the *OECD Economics Department Working Papers* series. However, Holden and Nymoer (1998) argue that estimates of rising NAWRUs for the Nordic countries may be misleading. While some of their conclusions may reflect conceptual differences in the definition of structural unemployment, and the strength of their evidence may be assessed differently, it must be acknowledged that estimates of structural unemployment are particularly uncertain where economies were subject to large shocks, as was the case in Finland and Sweden in the early 1990s.

In sum, while OECD estimates of structural unemployment rates are subject to conceptual and numerical uncertainties, the evidence suggests that changes in estimated structural unemployment rates in the 1990s matched real changes in labour market conditions in OECD countries. This, in turn, suggests that the three-way classification of countries in Table 1 permits a meaningful identification of successes and failures.

## 2. Determinants of structural unemployment in OECD countries

The preceding section identifies several countries that have either maintained low structural unemployment rates during the past decade or have managed to significantly reduce them. This section explores the possible determinants of the significant cross-country disparities in structural unemployment rates, drawing on the Scarpetta (1996) approach. Our empirical analysis extends Scarpetta's work in three main directions by:

- Considering a larger number of countries (from 17 to 19) and extending the time period;
- Exploiting recent information on the evolution of collective bargaining structures and employment protection legislation (EPL);
- Focusing on potential interactions between labour market policies and institutional factors.

### 2.1. A reduced-form unemployment equation

The theoretical framework for the analysis follows the familiar Layard-Nickell-Jackman (1991) model characterised by an upward sloping *wage-setting* schedule, based on the assumption that real wages are the results of a bargaining process between employers and employees, and a downward-sloping *labour-demand* schedule. Product market conditions, including the price mark-up over marginal costs, influence the latter, while a range of wage-push factors influence the wage-setting schedule.

It can be easily shown that the intersection of the labour demand curve and the wage-setting schedule identifies the structural (or equilibrium) unemployment rate and the equilibrium level of real wages. In this framework, structural unemployment is a function of wage-push factors, price-push factors, and the elasticities of real wages and price mark-ups to unemployment.

In our empirical analysis of the determinants of structural unemployment, we tested several potential wage- and price-push factors, including income-support schemes for the unemployed; active labour market policies; the tax wedge; EPL; the structure of collective bargaining; and minimum wages.<sup>5</sup> To quantify the relative importance of these policy and institutional variables in determining the wide disparities in structural unemployment across OECD countries, we estimated a static model over the 1983-1995 period. The period corresponds, more or less, to a full business cycle, over which structural unemployment has changed only moderately in most OECD countries, at least compared with the sharp increases of the 1970s and early 1980s. This is also the period for which most of the information is available on labour market institutions and labour market policies.

Pooling data for 19 countries<sup>6</sup> over the 1983-95 period and adding an explanatory variable to account for the effects of aggregate demand fluctuations over the cycle,<sup>7</sup> the determinants of the actual unemployment rate were modelled by a reduced-form equation with this structure:

$$u_{it} = \mu_0 + \mu_i + \sum_k \beta_k x_{kit} + \gamma z_t + \phi g_{it} + \nu_{it} \quad (1)$$

where  $i$  indexes countries,  $t$  the years,  $u$  is the unemployment rate,  $x$  denotes a set of time-varying explanatory variables,  $z$  is our measure of public spending on active labour market policies per unemployed person,<sup>8</sup>  $g$  is the output gap included to account for changes in the

<sup>5</sup> The OECD has produced quantitative indicators for each of these factors (see Scarpetta, 1996, for definitions and sources for all the variables except statutory minimum wages, which are described in OECD, 1998b). We used these data as regressors in our reduced-form unemployment equation.

<sup>6</sup> The set of 19 countries includes: Japan, western Germany, France, Italy, Canada, Australia, Austria, Belgium, Denmark, Finland, Ireland, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the US and UK.

<sup>7</sup> Different variables are used in the literature to proxy aggregate demand effects. Layard and Nickell (1997) and Phelps (1994) used changes in inflation, while Coe (1990) used changes in capacity utilisation, as did Sargent and Sheikh (1996) who also included the output gap in their equation. We used the latter variable but also tested for the effects of replacing it by the change in inflation. The results were less satisfactory, most likely because in some countries factors other than aggregate demand (e.g., changes in macroeconomic policy regimes or income policy agreements) affected inflation.

<sup>8</sup> By construction, active spending per unemployed relative to GDP per worker (ALMPU) is highly endogenous and must be instrumented. We used the average of ALMPU over the entire sample period as the instrument. We also experimented

business cycle,<sup>9</sup>  $\mu_0$  is a constant,  $\mu_i$  is the country-specific effect not accounted for by the available explanatory variables, and  $v$  is the usual error term.<sup>10</sup> Table B1 shows the key characteristics of the data set (see Scarpetta, 1996 for more details).

Table 2 presents the results of estimating different specifications of the reduced-form, unemployment-rate equation. The first three columns of the table focus, in turn, on key features of collective bargaining arrangements—namely, the degree of co-ordination in bargaining (column 1), the predominant bargaining level at which wages are negotiated (centralisation/decentralisation) (column 2), and a summary measure that combines the degree of centralisation/co-ordination (column 3).<sup>11</sup> Column 4 introduces the tax wedge in the

with using government spending (less net interest paid and labour market spending) as the instrument: first active spending as a share of GDP was instrumented with government spending, and then the instrumented variable was normalised with a smoothed employment/unemployment (E/U) ratio. The approach was not pursued because of the limited power of government spending in explaining the variations in active spending in some countries, and because the explanatory power of the overall instrument variable in the reduced-form unemployment equation was extremely sensitive to the choice of the smoothing factor for the E/U ratio.

<sup>9</sup> The gap variable is defined as the proportional difference between actual and trend output, where the latter is estimated by applying the Hodrick-Prescott filter to GDP. To minimise possible problems in estimating trend output at the two extremes of the series (1983 and 1995), we used a longer time series from 1970 to 1998 (the latter based on the latest OECD projections). Note that the assumption of an identical parameter for the gap variable across all cross-sectional units does not significantly affect estimated coefficients for the other explanatory variables.

<sup>10</sup> The conventional F-test was used to check for unobservable, country-specific effects and when the null hypothesis was rejected at conventional significance levels, random-effects models were considered. The assumption that country-specific effects are random was tested using the Breusch-Pagan test, and Hausman's (1978) orthogonal test was used to test for the correlation between the random country-specific effects and the other regressors. Finally, the following observations were removed from the sample because the diagnostic analysis revealed that they severely affected the standard error of the regression and/or the estimated coefficients: 1983 and 1984 for Portugal; 1993, 1994, and 1995 for Finland; 1983 and 1994 for New Zealand; 1995 for Sweden and for Spain. See Scarpetta (1996) for details on the tests used to identify outliers in the data set.

<sup>11</sup> In Tables 2 and 3, the reference group includes countries with either decentralised wage bargaining, low co-ordination or a low index of centralisation/co-ordination. Thus the estimated coefficients on the other two groups refer to the performance of these systems *relative to* decentralised/uncoordinated bargaining systems. A positive coefficient implies, other things being equal, a positive effect on the unemployment rate of the bargaining system relative to the decentralised

analysis, while column 5 replicates the same specification on a sample that excludes Sweden to test for changes in the estimated parameter for active labour market policy (ALMPU).<sup>12</sup> Finally, equation 6 tests for the possible influence of statutory minimum wages on aggregate unemployment rates. Statutory minimum wages exist in only nine of the 19 countries considered in our analysis. So the coefficients for the other explanatory variables in column 6 are not necessarily comparable with those in the other columns.

There is clear evidence in Table 2 that different collective bargaining arrangements affect labour market outcomes. A high degree of co-ordination on employer and employee sides (HGCOOR) can significantly reduce structural unemployment insofar as such co-ordination provides a mechanism by which economy-wide labour market conditions can be internalised in the wage-setting process, increasing the sensitivity of real wages to shocks. There is also some evidence (see column 2) that highly centralised (HGCENTR) and fully decentralised bargaining systems lead to somewhat lower structural unemployment compared with intermediate (sectoral) systems (INTCENTR).

The summary measure of collective bargaining structures (INTCORP and HGCORP) brings together the different features of co-ordination and the bargaining levels into a single indicator. For example, the summary measure allows us to consider cases where cross-industry co-ordination between employers and unions in an industry bargaining setting (e.g., Germany and Austria and more recently, Ireland and the Netherlands, with centralised income policy agreements) may be an alternative or functionally equivalent to centralised systems.

system, and *vice versa*. In the table, the INT acronym represents *intermediate*, HG represents *high*. Appendix B discusses changes in these country groupings over time.

<sup>12</sup> Sweden has been characterised by extremely high expenditures on active labour market programmes (four times the OECD average) in the 1983-1995 period and by levels of unemployment which, albeit low (until the early 1990s), are comparable with those of countries that spent much less on ALMPs.

**Table 2. Reduced-form unemployment rate equations, 1983-95<sup>a</sup> (random effects, FGLS)**

	1	2	3	4	5 <sup>b</sup>	6
ALMPU	-0.11* <i>0.06</i>	-0.11* <i>0.06</i>	-0.09 <i>0.06</i>	-0.11* <i>0.06</i>	-0.53** <i>0.21</i>	..
UB	0.11*** <i>0.02</i>	0.08*** <i>0.02</i>	0.10*** <i>0.02</i>	0.09*** <i>0.02</i>	0.10*** <i>0.02</i>	-0.01 <i>0.05</i>
EPL	0.32* <i>0.17</i>	0.34* <i>0.19</i>	0.38** <i>0.18</i>	0.33* <i>0.19</i>	0.37** <i>0.19</i>	0.68*** <i>0.24</i>
UDENS	0.01 <i>0.02</i>	-0.01 <i>0.02</i>	-0.02 <i>0.02</i>	-0.02 <i>0.02</i>	-0.01 <i>0.02</i>	-0.06** <i>0.03</i>
INTCOOR	-0.40 <i>0.48</i>					
HGCOOR	-1.91*** <i>0.48</i>					
INTCENTR		0.66* <i>0.39</i>				
HGCENTR		-0.79* <i>0.43</i>				
INTCORP			0.61* <i>0.35</i>	0.58* <i>0.35</i>	0.35 <i>0.36</i>	..
HGCORP <sup>c</sup>			-1.39*** <i>0.34</i>	-1.48*** <i>0.34</i>	-1.25*** <i>0.35</i>	-1.69*** <i>0.45</i>
TWEDGE				0.10** <i>0.04</i>	0.14*** <i>0.04</i>	0.12* <i>0.06</i>
GAP	-0.46*** <i>0.03</i>	-0.50*** <i>0.03</i>	-0.50*** <i>0.03</i>	-0.51*** <i>0.03</i>	-0.49*** <i>0.03</i>	-0.62*** <i>0.05</i>
MINWAGE						-0.02 <i>0.03</i>
Observations	238	238	238	238	226	112
Countries	19	19	19	19	18	9
F-test <sup>d</sup>	111.3***	125.4***	146.3***	136.6***	123.5***	86.3***
B&P LM <sup>e</sup>	1001.4***	1050.6***	1119.1***	1086.4***	1043.8***	172.4***
Hausman <sup>f</sup>	8.5	7.1	8.0	11.6	9.0	6.0

Notes: Each coefficient represents the expected change in the unemployment rate in response to a unitary change in the independent variable.

\* = Statistically significant at 10% level

\*\* = Statistically significant at 5% level

\*\*\* = Statistically significant at 1% level

<sup>a</sup> All regressions include a constant term, standard errors in *italic*.

<sup>b</sup> Sweden is excluded from the panel data set for this regression.

<sup>c</sup> Due to the limited number of countries in the HGCORP group in the equation 6 specification, HGCORP includes low & high centralisation/co-ordination countries.

<sup>d</sup> F-test of the hypothesis of absence of country-specific fixed effects.

<sup>e</sup> Breusch and Pagan LM test of the hypothesis of randomness of country-specific effects. The statistic is distributed as an  $\chi^2(1)$ .

<sup>f</sup> Hausman (1978) structural test, distributed as an  $\chi^2$ .

The estimated coefficients for the measures of centralisation/co-ordination (decentralised countries are the reference group) give some support to the hump-shaped hypothesis (Calmfors and Driffill, 1988), whereby highly centralised/co-ordinated systems and fully decentralised systems help to restrain the insiders' wage claims and thereby serve to lower structural unemployment.

It is also interesting to note that union density (UDENS), per se, does not help to explain cross-country differences in structural unemployment, once other features of the collective bargaining system are considered. Moreover, the empirical analysis did not detect a statistically significant impact of statutory minimum wages (relative to the average wage) on aggregate unemployment.<sup>13</sup>

Turning to the role of labour market policies, there is strong evidence that more generous unemployment benefits (UB) lead to higher structural unemployment. The implicit average elasticity of unemployment with respect to the OECD summary measure of benefit entitlements is around 0.4, a value that is close to those often found in the microeconomic literature (Holmlund, 1998).

The econometric evidence is mixed concerning the role of active labour market policies. The results in the first four columns of Table 2 show that our measure of spending on active labour market policies always has a negative coefficient; however, it is only marginally significant. But as Scarpetta (1996) has demonstrated, the presence of Sweden in the panel is crucial for this inconclusive result: if Sweden is excluded on the grounds that it is an outlier in the panel data set, the magnitude and statistical significance of the estimated coefficient for ALMPU increases sharply (the estimated coefficient becomes -0.53 in equation 5 in Table 2).

For employment-protection legislation (EPL), our results point to a positive impact of strict regulations on firing on structural unemployment. These results are somewhat more robust than those previously found by Scarpetta (1996). A possible explanation for this is that the measure of EPL used in Table 2 accounts for recent changes in regulations.

Finally, the tax wedge (TWEDGE) is statistically significant in all equations. The estimated elasticity of unemployment with respect to the tax wedge is moderate (around 0.5), which implies that the ob-

<sup>13</sup> But econometric analysis for the same panel of nine OECD countries, reported in OECD (1998b), shows that high levels of the minimum relative to average earnings reduce youth employment.

served reduction in the OECD average tax wedge of 7 percentage points during the 1983-1995 period could have contributed to reduce structural unemployment by about 0.7 percentage points.

It is of interest to compare our results with those of Layard and Nickell (1997) for 20 OECD countries based on two cross-sections for 1983-88 and 1989-94. The first point to note is that there is quite a high concordance between the two sets of results regarding the determinants of unemployment rates across OECD countries. Both studies assign significant roles to unemployment benefits, collective bargaining structures, active labour market policies (allowing for the caveat about the exclusion of Sweden), and the tax wedge—even if the variables in question are defined somewhat differently between the two studies. There are also some notable differences. For example, Layard and Nickell (1997) do not find a significant effect from EPL on the total unemployment rate. Their equation also includes the owner-occupier rate that is not included in our regressions, and they use changes in inflation to account for cyclical fluctuations of the unemployment rate, while we use the output gap.

## **2.2. Structural unemployment and reforms in the successful countries**

How do these results help to explain the role of labour market and institutional reforms on the estimated changes in structural unemployment? To answer this question we do not use the NAWRU estimates in Table 1. Instead, we proxy structural unemployment by adjusting the actual unemployment rate by the estimated cyclical component based on the coefficients of the output gap in Table 2. Then, Table 3 breaks down the estimated changes in structural unemployment into the contributions of the main determinants, namely changes in unemployment benefits, the tax wedge, and institutional settings (i.e., the joint impact of collective bargaining systems and EPL) plus a residual that accounts for changes in unobserved country-specific factors.<sup>14</sup> For each country, the estimated parameters of equation 4 in Table 2 were used to compute the expected changes in unemployment that result from the observed changes in each of the explanatory variables. The calculations were made for two time peri-

<sup>14</sup> A positive value of the country-specific effect means that other (omitted) factors have contributed to raise structural unemployment, while a negative value suggests that omitted factors have contributed to reduce structural unemployment.

ods, the full 1983-1995 sample period and the 1990-95 sub-period. In Ireland, the Netherlands, and the UK—which began introducing reforms in the early to mid-1980s—structural unemployment fell over the entire period covered in the empirical analysis (Table 3a.). In New Zealand, Australia, and Denmark, where most reforms were introduced somewhat later, falls in structural unemployment were recorded in the 1990s. For the latter countries, the decomposition over the 1990-95 period (Table 3b) is more meaningful.

An important fraction of the estimated change in structural unemployment cannot be accounted for by changes in the explanatory variables included in our analysis. Other omitted factors probably played important roles. And possible interactions between labour market policies and institutional factors, albeit difficult to identify (see below), have not been considered in the decomposition of Table 3. Bearing these caveats in mind, we can see that reforms in the key policy areas in the six *success* countries have generally gone in the direction of reducing structural unemployment, although there are noticeable differences between them in the contribution that can be assigned to each of the policies and institutional reforms.

To draw some lessons from the success stories, it is of interest to specify in somewhat greater detail what policy reforms were undertaken in these countries. Evidently, policy settings in many areas, including importantly product markets, have the scope to affect labour market outcomes, but the focus here is restricted to policies that impinge directly on labour markets.

During the past 15 years, while several OECD countries have increased the generosity of *unemployment benefits* by altering one or other of the central parameters of the system (i.e., replacement rates and duration of benefits), five of the six success countries either kept them unchanged or curtailed them.<sup>15</sup> As an illustration, in countries

<sup>15</sup> Australia is the exception. For Denmark, the OECD summary measure does not pick up the fact that the abolition in 1993 of the possibility of renewing benefit eligibility through participation in ALMPs effectively implied a cut in maximum duration, which has been followed by further cuts and recently, by a combined cut in duration and the replacement rate for young workers. For Ireland, the abolition of the earnings-related benefit in 1995 implied a significant cut in replacement rates. In the UK, the recent introduction of the Job-Seekers Allowance implied a halving in the duration of unemployment insurance benefits to six months. The Netherlands reduced the maximum duration of benefits (from 2.5 years to 1.5 years), and benefits were not raised in line with increases in earnings. In New

such as Ireland, New Zealand, and the Netherlands, the estimated impact of changes in benefits during the 1990s on structural unemployment is in the order of 0.2 to 0.6 percentage points. Moreover, the six countries (like several others) tightened up on various aspects of eligibility and job-availability conditions for receipt of unemployment benefits that are not accounted for in the OECD summary measure of benefit generosity.<sup>16</sup>

**Table 3a. Accounting for the changes in structural unemployment, 1983/85-1993/95**

	Estimated change in structural unemployment <sup>a</sup>	UB	TWEDGE	Institutional factors <sup>b</sup>	Country- specific effect
Australia	0.9	0.4	0.1	-0.2	0.7
Austria	1.3	-0.1	0.1	0.2	1.2
Belgium	-0.4	-0.3	-0.1	0.0	0.0
Canada	-0.4	-0.2	0.4	0.0	-0.7
Denmark	-0.5	1.3	-0.1	0.0	-1.7
Finland	10.2	1.1	0.2	1.9	7.0
France	2.6	0.4	0.1	0.6	1.5
West Germany	1.2	-0.1	0.3	0.1	0.9
Ireland	-3.1	0.5	-0.2	-2.0	-1.4
Italy	5.5	1.6	-0.1	-1.5	5.5
Japan	0.7	0.1	0.1	0.1	0.4
Netherlands	-3.5	-0.4	-0.5	-2.1	-0.5
New Zealand	1.7	-0.3	-0.3	-0.1	2.3
Norway	1.6	0.5	-0.5	0.0	1.6
Portugal	-0.4	1.9	0.2	0.2	-2.7
Spain	4.7	-0.3	0.1	-0.2	5.1
Sweden	4.3	0.0	-0.4	1.9	2.8
UK	-1.6	-0.3	-0.4	-0.4	-0.5
US	-1.6	-0.2	-0.3	0.1	-1.2

*Notes:*

<sup>a</sup> Structural unemployment is proxied by actual unemployment minus the cyclical component estimated from the coefficient of the output gap in col. 4 of Table 2.

<sup>b</sup> The degree of centralisation/co-ordination and the index of employment protection legislation (EPL).

Zealand, several changes were made since the late 1980s, which cut the average replacement rate from a peak of 33% in 1987 to the current 27%.

<sup>16</sup> See Martin (1996) for a review of the OECD summary measure. An international overview of various dimensions of availability and eligibility does not suggest that the levels of these requirements deviate in any systematic manner between the six countries and other OECD countries (Danish Ministry of Finance, 1998).

**Table 3b. Accounting for the changes in structural unemployment, 1990-1995**

	Estimated change in structural unemployment <sup>a</sup>	UB	TWEDGE	Institutional factors <sup>b</sup>	Country- specific effect
Australia	-0.3	0.1	0.0	-0.3	-0.2
Austria	0.2	-0.4	0.1	0.1	0.4
Belgium	1.7	-0.3	0.5	0.0	1.6
Canada	0.2	-0.1	0.3	0.0	0.0
Denmark	-0.7	1.4	-0.1	0.0	-2.0
Finland	9.6	0.6	0.3	-0.2	8.8
France	0.9	0.0	0.3	0.2	0.5
West Germany	1.1	-0.1	0.3	0.1	0.9
Ireland	-2.1	-0.2	-0.1	0.0	-1.8
Italy	1.8	1.5	0.1	-1.5	1.7
Japan	-0.3	0.0	-0.2	0.0	-0.2
Netherlands	-0.7	-0.6	-0.1	0.0	0.1
New Zealand	-1.4	-0.4	0.1	-0.1	-1.0
Norway	0.7	0.0	-1.6	0.0	2.3
Portugal	-0.3	0.2	0.0	0.0	-0.5
Spain	2.2	-0.2	0.2	-0.2	2.4
Sweden	4.2	-0.2	-0.4	1.9	2.8
UK	-0.5	0.0	0.0	0.0	-0.5
US	-0.8	0.1	0.0	0.0	-0.8

*Notes:*

<sup>a</sup> Structural unemployment is proxied by actual unemployment minus the cyclical component estimated from the coefficient of the output gap in col. 4 of Table 2.

<sup>b</sup> The degree of centralisation/co-ordination and the index of employment protection legislation (EPL).

Measured relative to GDP, spending on *active labour market programmes* shows large variations across the six countries. But three of them, Denmark, Ireland (in the 1990s), and the Netherlands, are well above average regarding spending on active policies. These countries also managed to shift more of their spending on labour market policies toward active policies and away from unemployment benefits during the 1985-97 period. In Australia, New Zealand, and the UK, there has also been a shift in the orientation of spending on active policies toward job-search assistance and counselling for groups with particular disadvantages in the labour market. In Denmark, this shift in emphasis was a key element of the 1994 labour market policy re-

form, which laid down that individual action plans must be prepared for all people with more than three months of unemployment.

The overall *tax wedge on labour use* has been reduced in several OECD countries over the past decade, including the six success stories. The tax burden was reduced by more than 5 percentage points in the UK, Ireland and New Zealand, and by almost 8 percentage points in the Netherlands (albeit from an extremely high level in the early 1980s). According to our econometric estimates, these reductions could have lowered structural unemployment by about 0.2 to 0.5 percentage points. Australia recorded a decline in the tax wedge in the late 1980s that was subsequently reversed.

Because of their direct effect on labour costs, employer social security contributions were cut in recent years in several countries, sometimes targeted to encourage the hiring of low-wage workers. Thus, the Netherlands, Ireland, and to a minor extent the UK, reduced these contributions together with France and Sweden. But in the latter two countries, the tight fiscal position meant that other taxes had to be raised to offset the revenue loss.

Though there are marked differences in the strictness of EPL across OECD countries, there has been a tendency toward less constraining hiring and firing practices in several of them, including some of the six success cases. In particular, there has been some relaxation of EPL in the case of individual and/or collective dismissals in the UK (1993), and in Italy (1991), Portugal (1989, 1991), Spain and, more recently, in Germany and the Netherlands. In Australia, in response to employers' concerns about the 1993 tightening of regulations, new legislation was introduced in 1994 and 1995 to reduce legal costs to employers and to simplify procedures for dismissal in justified circumstances. But France moved in the opposite direction, with some easing of dismissal procedures (abolition of the administrative authorisations) in 1986 being followed by tightening in 1989 and 1993 for collective redundancies (the introduction of social plans).

As previously stressed, there are several relevant dimensions to *wage formation* that make it difficult to characterise a country as having done better or worse over time in this field. In addition, many aspects of wage formation are only indirectly amenable to policy influence, resting principally on private-sector decisions. Notwithstanding these difficulties, the six countries seem to have moved away from uncoordinated, sectoral, wage bargaining to either higher co-ordination or full decentralisation, both leading to greater wage mod-

eration and lower structural unemployment, at least according to our empirical results (see Table 3). Widespread decentralisation of wage bargaining has been the result of a deliberate policy aimed at reducing union power in the UK and New Zealand. Wage bargaining has also been substantially decentralised in Denmark, though employers maintain a significant element of co-ordination, and Australia has also moved toward decentralisation since the late 1980s, if from a very particular starting point. By contrast, Ireland (since 1988) and the Netherlands (since 1983) have conducted wage bargaining with close co-ordination among the government, employers' associations, and trade unions.

At the end of the day, what appears to set apart the six success stories from those countries that have failed to prevent a rise in structural unemployment in the 1990s is that they have implemented policy reforms across most of the key policy areas identified in the empirical analysis. Indeed, the six countries stand out as a group more in terms of the *comprehensive* coverage of reforms than in terms of their having taken particularly bold steps in specific areas—with industrial relations reform in New Zealand and to some extent in the UK, standing out as exceptions. To this comprehensive approach must be added the effects of relatively successful macroeconomic policies (see below).

Comprehensiveness seems indeed to be a crucial feature of any successful strategy to reduce unemployment because reforms in different areas can reinforce each other's effects. Conversely, policies that tend to drive up unemployment may also be mutually reinforcing. An example is that an increase in payroll taxes may have a larger effect on unemployment if introduced in a context of a high minimum wage, which prevents backward shifting of the tax hike into wages.<sup>17</sup>

### **2.3. Are there significant interactions between labour market policies and institutions?**

Labour market policies may have a different impact on the functioning of the labour market depending upon the institutional framework within which they operate. Interaction mechanisms are generally

<sup>17</sup> Such interaction effects have recently received theoretical backing in Coe and Snower (1997). At the practical level, the OECD's reviews of individual countries' progress in implementing the *Jobs Strategy* have thrown up many examples of such interactions between policies in different fields—for details, see OECD (1997b).

complex and may not be fully accounted for by the analytical approach used in this study. But to shed some preliminary light on this issue, Table 4 presents the results of reduced-form unemployment rate regressions in which some policy parameters are allowed to vary across different policy and institutional settings. The results reported refer to those interactions that were statistically significant.

Column 1 in Table 4 suggests that unemployment benefits probably have different effects on structural unemployment depending on the intensity of public spending on active labour market policies. In countries that spend a lot on active programmes, per person unemployed, unemployment benefits have a slightly stronger impact than they do in the intermediate group of countries.<sup>18</sup> This result has intuitive appeal: the joint effect of generous benefits and high spending on active programmes serves to raise the reservation wage of the unemployed over and above what each policy in isolation would have done and thus leads to an even stronger aggregate impact on unemployment. But given this reasoning, one would expect to find the largest interaction effect for the countries with the highest spending on ALMPs, followed by the group of intermediate and low-spending countries in that order. The fact that our estimates do not match this pattern is a finding for which we have no satisfactory explanation.

Buti et al. (1998) argued that strict EPL may act as a substitute for unemployment insurance benefits. Under this hypothesis, countries might opt for either generous unemployment benefits and lax EPL or *vice versa*, and a combination of generous benefits with strict EPL could lead to higher structural unemployment. But the evidence in column 2 of Table 4 does not support this hypothesis: the estimated effect of unemployment benefits is not statistically different in countries with either strict or lax EPL.

Table 4 suggests that different collective bargaining arrangements influence the way in which EPL and the tax wedge affect unemployment. In both cases, the positive impact on aggregate unemployment is stronger and statistically significant in countries with an intermediate degree of centralisation/co-ordination, i.e., where sectoral wage bargaining predominates with limited co-ordination, while neither EPL nor the tax wedge are statistically significant in either highly

<sup>18</sup> The Wald test rejects the restriction that the coefficients of UB are equal for the three groups of countries according to their spending on ALMPs.

centralised/co-ordinated or decentralised countries.<sup>19</sup> These results are consistent with the hypothesis that when insiders have strong bargaining power, they may more easily resist employers' attempts to reflect higher payroll taxes and/or high turnover costs (due to strict EPL) in lower wages, even if this works to the detriment of outsiders.

Bearing in mind the tentative nature of these results, they may have some implications for the understanding of the determinants of changes in structural unemployment discussed above. In particular, the impact of significant changes in the tax wedge may have been less marked in countries with either a high degree of centralisation/co-ordination (i.e., Austria and Germany) or decentralised wage bargaining systems (i.e., Canada and Japan). Conversely, the impact could have been stronger in countries with intermediate wage bargaining settings (e.g., Belgium, Finland, France, and Spain). Similarly, the tightening of EPL in France in 1989 and 1993 might have produced a more important increase in structural unemployment than that calculated in Table 3, while the loosening of EPL in Portugal in the 1990s might have contributed more strongly to the estimated reduction in structural unemployment.

#### 2.4. The role of macroeconomic policies

Sound macroeconomic policies are an important element in any comprehensive strategy to combat high and persistent unemployment. This is in part because large macroeconomic fluctuations are likely to contribute to rising structural unemployment as increases in unemployment, which are initially cyclical, tend, over time, to become structural.<sup>20</sup>

<sup>19</sup> Daveri and Tabellini (1997) obtained a similar result for the differentiated impact of the tax wedge on unemployment, although they included a smaller number of countries in their analysis and used a slightly different classification of countries according to the collective bargaining system.

<sup>20</sup> This would also occur if the impact of unemployment on wage inflation is non-linear (the Phillips curve). For example, if the difference between the log of unemployment and the log of the natural rate drives changes in inflation, the average level of unemployment will be larger, the greater the variance of unemployment, even if the log of unemployment is on average equal to the log of the natural rate. Indeed, if  $(\log U - \log U^*)$  is normally distributed with mean zero and variance  $\sigma^2$ , then the expected value of  $U$  is:  $E(U) = \exp(\log U^* + \frac{1}{2}\sigma^2)$ . Turner (1995) presents estimation results that suggest that, for three of the G7 countries, the inflationary effects of a positive output gap (output being above trend) are much bigger than the disinflationary effects of a corresponding negative output gap.

Table 4. Reduced-form unemployment rate equations, 1983-

	1	2	3	4
ALMPU	-0.30 <i>0.23</i>	-0.11* <i>0.07</i>	-0.04 <i>0.07</i>	-0.06 <i>0.06</i>
UB			0.10*** <i>0.02</i>	0.09*** <i>0.02</i>
UB*LWalmpu	0.21*** <i>0.04</i>			
UB*INTaimpu	0.05** <i>0.02</i>			
UB*HGalmpu	0.11** <i>0.05</i>			
UB*LWepI		0.09*** <i>0.03</i>		
UB*HGepI		0.10*** <i>0.03</i>		
EPL	0.28* <i>0.17</i>	0.31 <i>0.20</i>		0.26 <i>0.17</i>
UDENS	-0.01 <i>0.02</i>	-0.02 <i>0.02</i>	-0.02 <i>0.02</i>	-0.01 <i>0.02</i>
INTCORP	0.25 <i>0.35</i>	0.55 <i>0.36</i>	0.53 <i>0.34</i>	0.46 <i>0.35</i>
HGCORP	-1.65*** <i>0.38</i>	-1.49*** <i>0.34</i>	-1.46*** <i>0.33</i>	-1.42*** <i>0.34</i>
EPL*HGCORP			-0.12 <i>0.29</i>	
EPL*INTCORP			0.50** <i>0.21</i>	
EPL*LWCORP			0.35 <i>0.33</i>	
TWEDGE*HGCORP				0.06 <i>0.05</i>
TWEDGE*INTCORP				0.15*** <i>0.05</i>
TWEDGE*LWCORP				0.12* <i>0.06</i>
TWEDGE	0.15*** <i>0.04</i>	0.10** <i>0.04</i>	0.10** <i>0.04</i>	
GAP	-0.49*** <i>0.03</i>	-0.51*** <i>0.03</i>	-0.50*** <i>0.03</i>	-0.50*** <i>0.03</i>

... continued on next page

**-1995: interactions between explanatory variables.**

<i>... continued ...</i>	1	2	3	4
Observations	226	238	238	238
Countries	18 <sup>a</sup>	19	19	19
F-test	89.7***	124.6***	114.1***	101.0***
B&P LM test	890.0***	1034.0***	956.5***	853.7***
Hausman test	12.1	36.1***	12.4	11.1

Notes: See the notes for Table 2.

**Acronym      Dummy for countries with ...**

LWalmpu = Low levels of ALMPU: Australia, Canada, Italy, Japan, Spain, UK, US

INTalmpu = Intermediate levels of ALMPU; Austria, Belgium, Denmark, France, Ireland, the Netherlands, New Zealand, Portugal

HGalmpu = High levels of ALMPU; Finland, Germany and Norway

LWepI = Low levels of EPL: Austria, Canada, Denmark, Ireland, Japan, New Zealand, UK, and US

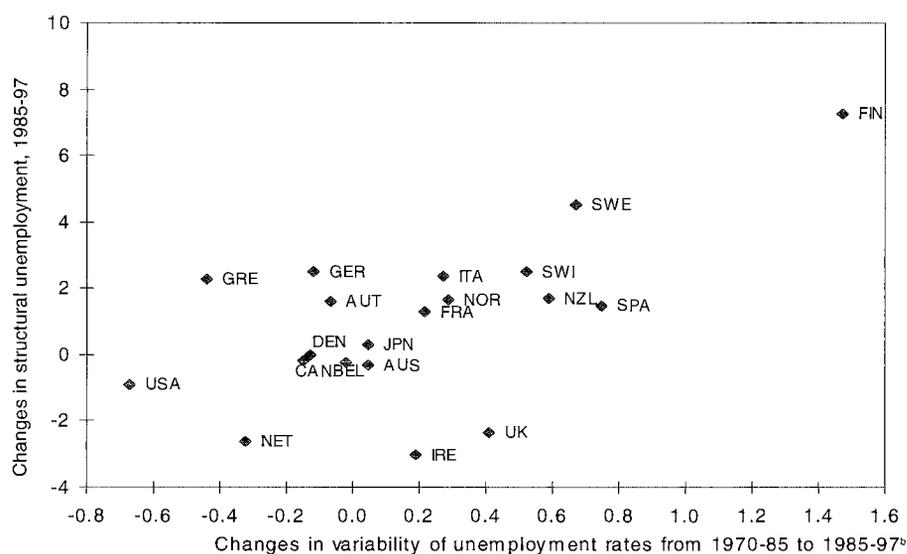
HGepl = High levels of EPL: Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, and Sweden

HGCORP = High, intermediate, low degree of centralisation/co-ordination. For  
INTCORP the list of countries in each group and changes over time, see Table  
LWCORP B2.

<sup>a</sup> Sweden is not included in the sample.

Across countries, a positive correlation exists between the degree of annual volatility of unemployment and the extent of the rise over time in structural unemployment (Figure 2). Thus, stable conditions may help to maintain low structural unemployment. As a corollary, countries with macroeconomic room for manoeuvre to counteract prolonged slumps in macroeconomic conditions (e.g., Norway) have often avoided strong increases in actual unemployment.

**Figure 2. Cyclical variability and structural unemployment,<sup>a</sup> 1985-97 (percentage points)**



Notes:

<sup>a</sup> Structural unemployment data are based on estimates of the NAWRU made for the OECD *Economic Outlook*, 63, 1998.

<sup>b</sup> Measured by the standard deviation of yearly changes in unemployment rates.

Source: OECD.

There are also potentially important interactions between macroeconomic and structural policy settings. Thus labour market policies can help determine to what extent cyclical unemployment increases

are translated into higher structural unemployment.<sup>21</sup> The policy implications of this include:

- For countries with very rigid labour markets, macroeconomic instability carries a particularly high price in terms of structural unemployment, whereas countries with flexible labour markets, most notably the US, have experienced large cyclical fluctuations in unemployment around a rather stable level of structural unemployment.<sup>22</sup>
- Moves toward medium-term macroeconomic targets will often be less costly in terms of unemployment if the appropriate structural policies have been implemented first (Ball, 1996). Conversely, a sequencing that involves moving toward macroeconomic targets before implementing structural reform may be expensive in terms of unemployment.

The medium-term orientation of macroeconomic policies will probably also be important. This is mainly due to the effects over the longer term of sound public finances and price stability on unemployment *via* the channel of real interest rates:

- A fall of real interest rates may lower production costs in much the same way that lower payroll taxes or energy prices would do, and it may raise capital accumulation and thereby labour productivity. Where wage earners do not receive a corresponding increase in real wages, unemployment might fall.
- In some cases, lower real interest rates may affect the bargaining attitudes of workers and the labour-demand behaviour of enterprises, leading to the end result of lower unemployment.<sup>23</sup>

<sup>21</sup> Scarpetta (1996) links slow adjustment of unemployment to strict employment protection, generous unemployment benefits, and aspects of wage bargaining systems. Layard (1989) finds that long benefit durations slow adjustment whereas centralised bargaining and expenditure on active labour market policies speed it up.

<sup>22</sup> Bean (1997) provides some empirical evidence of the long-lasting effect of a demand shock in EU countries compared with the US.

<sup>23</sup> Phelps (1992) argues that real interest rates affect the value that firms put on their customer base and their stock of employees familiarised with the firm, and thereby labour demand. Similarly, in a context where current employment raises the chances of future employment, a lower real interest rate may soften the bargaining stance of wage earners because the discounted value of future earnings associated with having a current job will increase.

- Lower real interest rates could also favourably affect productivity growth, either temporarily—while the capital-intensity of production responds, or more long lastingly—if the rate of innovation and its diffusion are affected. Increased productivity growth again might cause unemployment to fall. This would be the case to the extent it reduced the incidence of downward wage stickiness or facilitated wage bargaining by increasing the scope for real-wage gains.<sup>24</sup>

Empirical estimates of the effects of real interest rates on cross-country differences in unemployment yielded results that are variable but suggestive of significant impacts in some countries.<sup>25</sup>

### 3. Overcoming resistance to labour market reform

The analysis in the previous section treats a range of institutional and labour market policies as exogenous factors. On this view, unemployment is basically the result of misguided policies. But an alternative view sees the policy settings that influence unemployment as determined by political-economy considerations. This may also explain why it is so difficult to introduce policy reforms that will reduce unemployment. This section discusses the role that resistance by labour market insiders may have played as a hindrance to effective labour market reform; the role of equity considerations in shaping policies; and some evidence on the role of crises in overcoming resistance to reforms.

#### 3.1 Insider resistance as a hindrance to reform

There can be little doubt that the insider-outsider distinction is an important one. Figure 3 shows a cross-country breakdown of em-

<sup>24</sup> Manning (1992) argues that higher productivity and real-wage growth increase the incentives to set wages so that a job is retained.

<sup>25</sup> Scarpetta (1996) finds that the rise in real interest rates accounted for between 1 and 3 percentage points of the rise in the unemployment rate across 17 OECD countries during the 1971-93 period. Manning (1992), in a study of 19 OECD countries, finds effects suggesting that a 1 percentage point increase in real interest rates may increase unemployment by between 0 and 1 percentage point. In a study of 17 OECD countries, Phelps (1994) finds an impact of 0.1 to 0.4 percentage points on unemployment. Cotis et al. (1996) report estimates suggesting that rising real interest rates accounted for about half of the rise in the French equilibrium unemployment rate between 1974 and the mid-1990s.

ployment rates by age and gender. What sets countries apart in terms of overall employment/population rates is largely the extent to which *outsider* groups are employed. The young, older workers, and adult women represent outsiders in Figure 3. By contrast, the employment/population rates of prime-age males, a group dominated by *insiders* are much more similar across countries.

Arguments why insiders may oppose reforms that would produce higher employment for outsiders come in different forms. One such argument is that insiders are virtually unaffected by the unemployment consequences of labour market rigidities, but that the same rigidities may enhance their bargaining power in wage negotiations.

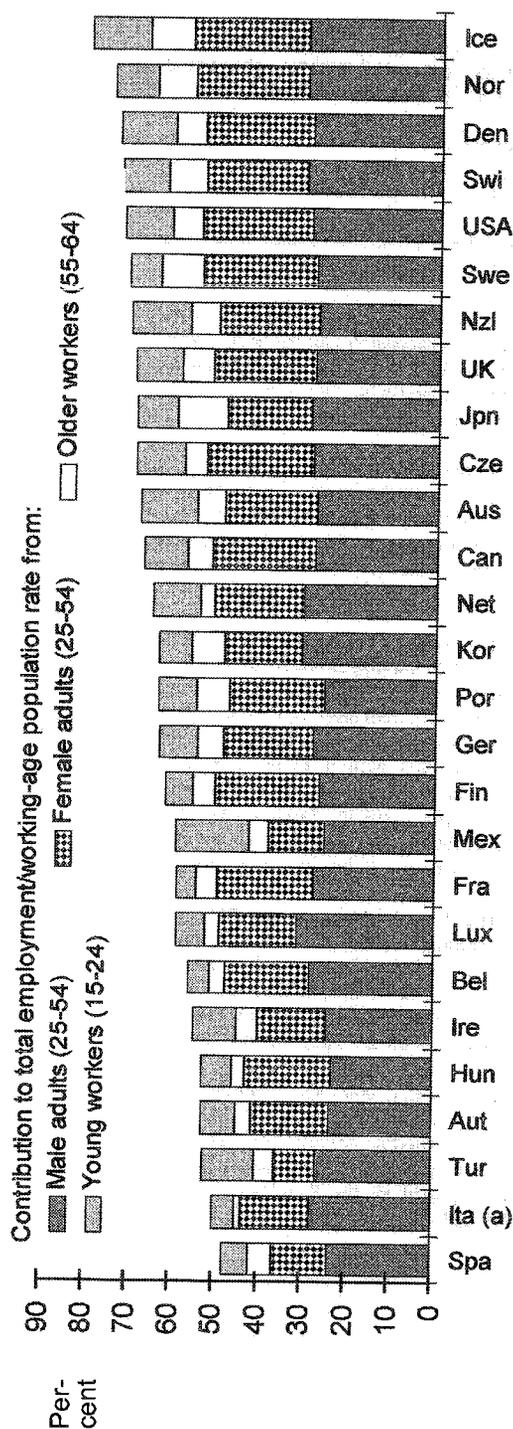
In these circumstances, insiders will have an interest in raising rigidities to the point where the extra gain in terms of higher real wages is offset by the loss in terms of added risk of unemployment and related income loss.<sup>26</sup>

Some empirical observations are consistent with such an insider-outsider view of policy determination:

- Across countries, there is a positive correlation between strictness of EPL for permanent workers and *excess coverage of wage contracts*, which is a measure of the extent to which union wage agreements are extended to non-union members (Figure 4). This suggests that the insiders, who benefit from strict EPL, may press for administrative extension of wage agreements as a protection against underbidding of their wages by outsiders.
- Spending on active labour market policies should empower labour market outsiders to compete more effectively with insiders. It may be no coincidence that Figure 5 shows a positive correlation between the extent of such spending (per unemployed and relative to per capita GDP) and the extent of union density. Where large parts of the labour market (including those with an outsider or near-outsider status) are organised, there may be greater internalisation of the gains from integrating outsiders and greater pressure to do so.

<sup>26</sup> Seeing policy settings as endogenously determined has potential implications for the Section 2 analysis. In principle, it could raise questions about the direction of causality of the links between unemployment and policy settings and about the extent to which coefficients in Table 2 may be biased as estimates of the impact of policy settings on unemployment. To spotlight this issue, we ran some Granger causality tests to explore the possibility of reverse causality (see Appendix B). The results mostly tend to support interpretations of the empirical results in Section 2.

**Figure 3. Decomposition of the employment rate, 1996**



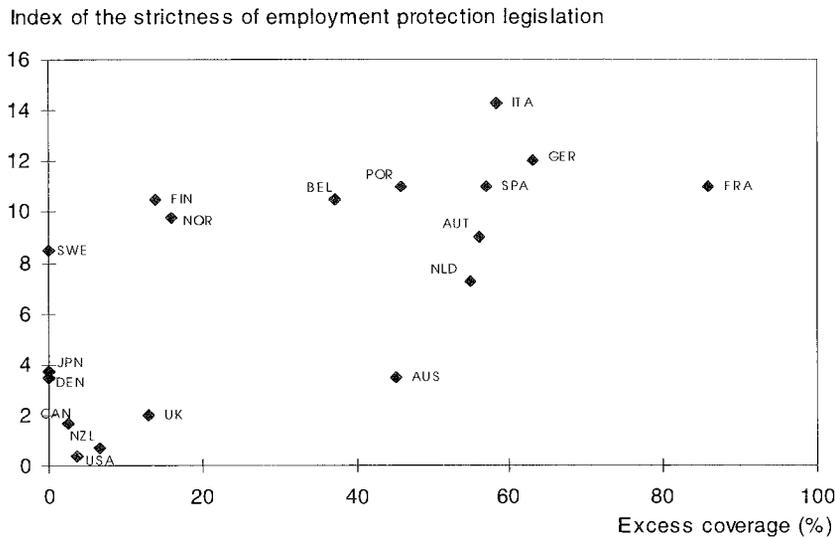
Notes:

<sup>a</sup> Italy 1997. Adults = 25-59 years of age.

The contributions of individual demographic groups to the overall employment/working-age population rate were calculated as the group-specific employment rates multiplied by the share of individual groups in the population of working age. The countries are ordered from left to right in ascending order of the total employment population rate.

Source: OECD Labour Force Statistics, Analytical Data Base.

**Figure 4. Employment protection legislation and coverage of wage agreements**



*Note.* The excess coverage index is the difference between the coverage rate (proportion of workers covered by the terms of wage agreements) and union density rate.

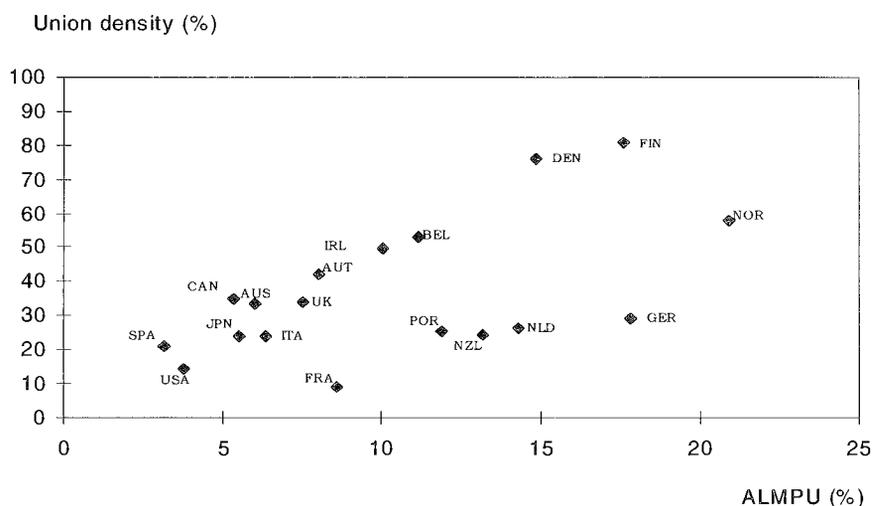
Evidence in OECD (1997b, 1998a) suggests that successful countries may have succeeded where others failed, in part, because their reform efforts to a greater extent were directed at reducing the bargaining power of insiders:

- Many countries have tightened up the eligibility conditions of their unemployment benefit schemes—a move that is unlikely to affect the insiders who, by definition, enjoy high job tenure. By contrast, central parameters of unemployment and related welfare benefit systems such as replacement rates and duration of benefits, which may affect the bargaining positions of insiders, were left relatively untouched in most countries outside the group of success stories.
- In a similar vein, many countries have eased up on the regulation of fixed-term contracts that expanded the supply of temporary jobs for outsiders, but it has typically been much more difficult to lower employment protection for permanent workers. In this context, Bentolila and Dolado (1994) argue that the existence of a group of temporary workers, who are easy to lay off, effectively

reduces the unemployment risk of the secure insiders, and thus strengthens their position in wage bargaining.

This raises the question why successful countries could introduce policy reforms that affected insiders whereas other countries could not. Initial weakening of insider power may be part of the answer.

**Figure 5. Union density and active labour market programmes**



*Note.* ALMPU is spending on active labour market programmes per unemployed relative to GDP per capita.

Thus in some of the successful countries, in particular the UK and New Zealand, governments took determined action at the outset of the reform process to weaken the bargaining power of insiders, notably through curbs on union rights and privileges. In other success countries, including Ireland, the Netherlands and Australia (at least in the initial phase of reform in the 1980s), there were moves toward increased centralisation of wage bargaining and a more corporatist attitude toward the setting of labour market policies, which may have led to a greater internalisation of outsider interests. But these are only proximate answers, because they do not explain why the weakening of insider power occurred in the first place.

In some cases, insider resistance may also have been reduced because individual reforms were seen as part of a comprehensive strategy of structural reforms. The argument would be that any individual

reform might hurt the insiders who will therefore resist it. But when individual reforms are part of a much wider strategy, affecting all groups, they may be seen as more fair, the losses suffered by any particular group may not appear excessive, and there may be a stronger likelihood of economy-wide gains that may compensate some of the losses.

### 3.2. Equity concerns as a hindrance to reform

A reason often cited by countries to account for slow and sporadic implementation of the *OECD Jobs Strategy* recommendations is the perception that undertaking reform of, in particular, wage formation, EPL and social transfer systems involves conflict with policy objectives concerning income distribution.

Reflecting the many complicated mechanisms operating in this area, OECD research as to the nature and magnitudes of any potential trade-offs has provided no conclusive evidence. Nevertheless, it has been suggested that equity and efficiency objectives do not necessarily conflict, or at least that the terms of the trade-off may change, when they are seen in a dynamic perspective. Three reasons have been quoted for this:

1. Increased employment, because of policy reform, will tend to offset, at least partly, the impact of increased wage dispersion and restricted social transfers on income distribution. Thus, a wider distribution of wage rates is likely to enhance the employment prospects of workers at the bottom of the qualifications scale. But little agreement exists about the magnitude of such employment effects, with econometric estimates of elasticities between relative wage rates and demands for different categories of labour being highly uncertain and variable across studies.<sup>27</sup>
2. There is evidence of considerable mobility of individuals over time within the earnings distribution, showing that in some cases low-paid jobs are a stepping-stone to good careers. Across countries, with large differences in the static distribution of earnings,

<sup>27</sup> For example, estimates of elasticities of substitution between different categories of labour substantially above one were found by Bound and Johnson (1992) and Katz and Murphy (1992) for the US, and by Risager (1992) for Denmark. In contrast, Machin et al. (1996) find an elasticity of around one for the US and less than one-half for the UK, Denmark and Sweden.

the degree of mobility seems remarkably similar.<sup>28</sup> OECD (1997c, Chapter 2) shows that, as a rule of thumb, after a period of five years only about one-third of those full-time workers initially receiving low earnings (belonging to the lowest earnings quintile) do so at the end of the period. A large part of the workers who left low-paid employment had moved up in the earnings distribution, though in some countries a significant fraction had also moved out of employment (in particular, this was the case in the US).

3. Lower relative incomes at the bottom of the scale may raise incentives for investment in human capital by groups who would otherwise have made little such investment; the existence of this kind of linkage is supported by evidence that, across countries, university graduation rates tend to be higher where the financial reward to such education is higher (Figure 6).<sup>29</sup> Such an effect, in turn, could reduce income dispersion over the longer run and assist the adaptation of the workforce to changing skills requirements.

Nevertheless, there are also arguments that might suggest that the equity-efficiency trade-off is even starker. For example, there is concern about the effectiveness of relative wage signals in influencing human-capital investment, not least because increased inequality of income, in a context of imperfect capital markets, may prevent those at the bottom of the income distribution from investing in their own or their children's education.<sup>30</sup>

In the context of the conflicting evidence on the strength, and perhaps even the sign, of the equity-efficiency trade-off, the Nordic countries have tended to take a strong position against wider dispersion of wage rates as a means of reducing unemployment. Instead, policies are directed toward validating the existing, relatively compressed earnings distributions in these countries by creating a similarly narrow distribution of individual productivities. The emphasis is

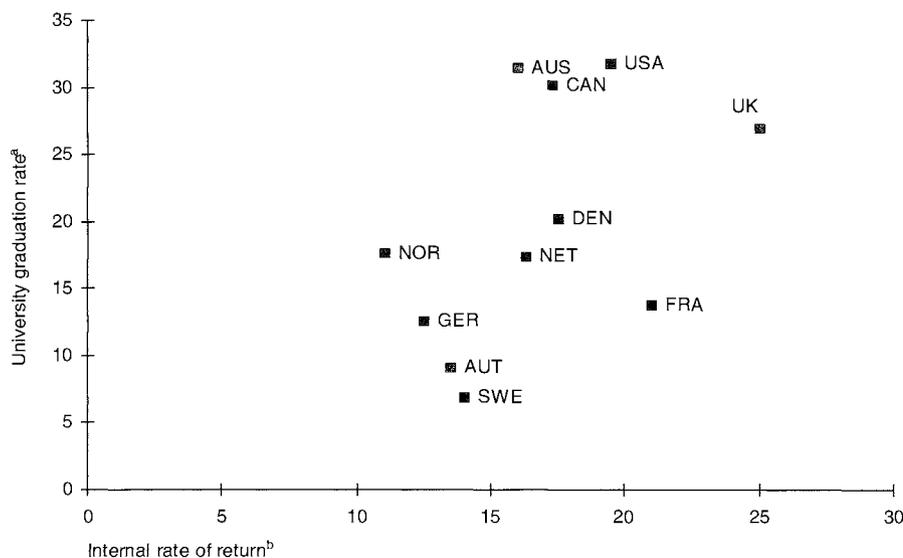
<sup>28</sup> This is based on the comparative data on earnings mobility in several countries presented in OECD (1996c, 1997c). Aaberge et al. (1996) also supported the finding of broadly similar mobility patterns across countries.

<sup>29</sup> The rates of return in Figure 6 do not account for the effects of tax-transfer systems, including support for students or different unemployment risks across education categories.

<sup>30</sup> Benabou (1996) presents a model that illustrates this point.

put, in particular, on education and active labour market policies to achieve this latter goal. But beyond a certain level of spending, active labour market policies may suffer from declining returns to scale. Even abstracting from this consideration, the results in Section 2 suggest that quite sizeable public spending in this area, with accompanying effects on taxes, could be required to validate relatively compressed earnings distributions. Moreover, there is a question as to how effective government subsidies to education, through near-free provision and generous grants, can be as an instrument to offset the disincentives arising from compressed wages and progressive taxes.

**Figure 6. Internal rate of return and university graduation rates**



*Notes:*

<sup>a</sup> Ratio of graduates from short first university degree programmes to population at the typical age of graduation in 1994 [long first university degree programmes where short first degree programmes are not available (Austria, France, and Germany)].

<sup>b</sup> Based on university wage *premia* in the early 1990s, theoretical length of study and assumed retirement at age 65.

Sources: OECD, *Education at a Glance*, Paris, 1996; OECD, *The OECD Jobs Study*, Vol II, Paris, 1994.

### 3.3. The role of crises in facilitating reform

OECD (1988) argued that crisis conditions are often necessary to change the general orientation of macroeconomic policies. In a similar vein, crises may help to overcome resistance to labour market reforms, be it based on insider intransigence or equity considerations. Indeed, it has been argued that many of the successful countries embarked on reform programmes because "existing policies could no longer be sustained" (OECD, 1997b).

Taking a more systematic view on the role of crises should begin with an attempt to date the beginning of the reform process. For the six successful countries, this produces the following picture:

- In Australia, the re-orientation of policies has been a gradual process, beginning with trade liberalisation and tri-partite wage Accords after the new Labour government took office in 1983. This process gathered speed in the late 1980s and early 1990s with moves toward decentralisation of wage bargaining and an increasingly medium-term orientation of macroeconomic policies.
- In Denmark, the 1982 change of government marks a relatively clear break, with an immediate shift toward a medium-term orientation for macroeconomic policies, based on a fixed exchange rate vis-à-vis the DM and fiscal consolidation, and the abolition of indexation of private and public-sector wages and income transfers.
- For Ireland, the shift in policy stance also dates back to the early 1980s when the incoming coalition government embarked on a major shift in the orientation of fiscal policies, emphasising the imperative need to halt the debt spiral. The 1987 change in government led to a strong focus on wage moderation achieved through tri-partite national agreements, and with a tax-based element as government finances improved. The 1990s have seen sustained attempts to raise work incentives via reforms to the tax/benefit system, cuts in the tax wedge, and increased spending on ALMPs.
- In the Netherlands, 1982 is also a watershed year, with a change of government, a shift toward fiscal consolidation (eventually to be followed by tax cuts) and deregulation, and the conclusion of the tri-partite so-called Wassenaar agreement on wage moderation.
- In New Zealand, the change of government in 1984 marks a clear shift in economic philosophy toward one of stability-oriented macroeconomic policies and market deregulation—a series of re-

forms to the collective bargaining system culminated in the Employment Contracts Act in 1991.

- In the UK, the change in government that occurred in 1979 also led to increased emphasis on market deregulation and macroeconomic stability—even if the latter proved to be rather elusive, at least until recently.

One notable lesson from this dating exercise is the role that changes in government seem to have played in the context of radical shifts in policy orientation. Not surprisingly, it is easier for a new government to break with past policies and strike out on a new path. A second lesson is that it can take a long time for a radical shift in policy orientation to bear fruits in terms of making significant inroads into structural unemployment. In most cases, the reform process in the successful countries got underway in the early or mid-1980s, but it took up to a decade before this was translated into success.

Even if a change of government was involved at the start of the reform process in the success countries, this does not explain why shifts in government in other countries did not lead to sustained reforms capable of reducing structural unemployment. We tried to examine whether particular features of economic developments might explain why reform programmes were enacted. The main results are:

- Major hikes in unemployment occurred in the years before the beginning of the reform process in Australia, Denmark, Ireland, and the Netherlands (Table 5). But for the other two success countries, it is difficult to argue that a sharp rise in unemployment was a major trigger of reform. And, some other countries experienced periods of significant rises in unemployment without embarking on sustained reforms. In other cases, though, sharp hikes in unemployment may have prompted a change in policy orientation that has not yet had sufficient time to work.
- A misery index, constructed by summing unemployment rates, government budget deficits, and external deficits relative to GDP, is not suggestive of crisis as a major common factor among the six countries. Denmark and Ireland are the only countries with a sharp rise in the misery index just before reform; Australia and the Netherlands had recorded a steady, but fairly slow, rise in the index; and, if anything, the index had tended to decline in the UK. Several other countries also recorded increases in the misery index that match those of the successful countries.

- Exchange-rate pressures are capable of precipitating or exacerbating crises, and they were strong at the time of policy change in Denmark, Ireland, and New Zealand. Moreover, while pressures may not have been as strong, the Netherlands actually devalued in 1982, and the UK exchange rate declined significantly through 1978 and into 1979 (the winter of discontent). But Australia did not really experience exchange-rate pressures before 1986, that is, after the reform programme had been launched.

**Table 5. Unemployment developments and policy reform 1961-96<sup>a</sup>**

Country <sup>b</sup>	Change in unemployment preceding policy reform		Maximum rise in unemployment over <sup>c</sup>	
	2 years	3 years	2 years	3 years
Australia (1983)	4.2	3.9	4.2 (83)	4.6 (92)
Denmark (1982)	2.8	3.6	4.5 (75)	4.5 (76)
Ireland (1982)	4.0	4.1	4.0 (84)	6.5 (83)
Netherlands (1982)	4.5	4.9	5.2 (83)	7.0 (83)
New Zealand (1984)	0.9	1.1	3.2 (91)	4.7 (91)
UK (1979)	-0.6	-0.3	4.5 (81)	5.9 (82)
US			3.6 (75)	3.9 (82)
Japan			0.7 (94)	1.0 (95)
Germany			3.4 (83)	4.7 (83)
France			2.3 (93)	2.8 (94)
Italy			2.5 (94)	3.1 (95)
Canada			4.3 (83)	4.4 (83)
Austria			1.8 (83)	2.2 (83)
Belgium			4.0 (82)	5.3 (83)
Finland			10.2 (93)	14.4 (93)
Greece			3.8 (83)	5.1 (83)
Iceland			2.9 (93)	3.3 (94)
Norway			2.8 (89)	3.1 (90)
Portugal			3.8 (76)	5.2 (77)
Spain			6.4 (93)	7.9 (94)
Sweden			5.3 (93)	6.6 (93)
Switzerland			3.4 (93)	4.0 (93)

Notes:

<sup>a</sup> Data availability restricts the period for some countries.

<sup>b</sup> Year when policy reform began in parentheses.

<sup>c</sup> End-year of rise in parentheses.

Overall, it is difficult to argue that the existence of a crisis, in the narrow sense of a sharp rise in unemployment, or in the misery index or in exchange-market pressures, was a common factor triggering policy reform in the success countries and setting them apart from other countries. Clearly, other countries went through crises without introducing policies sufficient to reduce structural unemployment. But the success countries generally began their policy reforms against a background of either full-blown crisis or, at least, critical developments. In sum, while the evidence is not very conclusive, it might tentatively be argued that crises tend to create a groundswell of support for reforms, though the ability to harness such support and translate it into actions depends on political factors, such as shifts in government.

#### 4. Concluding remarks

Recent OECD work on remedies for the unemployment problem has highlighted an important message: countries can reduce high and persistent unemployment significantly if they implement the right policies in a determined fashion.

This message is important because it runs counter to the sense of pessimism about tackling the unemployment problem that pervades much of the debate in the media and general public in many OECD countries today, especially in Europe. Hence, there is nothing inevitable about high unemployment, even if the evidence suggests that it can take quite some time for a successful strategy to bear its fruits.

It is also important to add that the six country successes highlighted by recent OECD research span a wide range of social, economic, and political models that include four EU countries.

When one reviews the experiences of the country successes and failures, one is struck by the great diversity in their experiences. There is no unique golden road to implement the policies required for success.

This paper identifies several policy settings and institutional features of the labour market that are associated with high structural unemployment. At the same time, it tries to highlight some important common features across those countries that were successful in reducing structural unemployment. In particular, we emphasise the importance of opting for a *comprehensive* set of reforms to all the policies and institutional factors that are the main determinants of structural unemployment, and to exploiting the synergies between these re-

forms and macroeconomic policies. We also draw attention to the important role played by changes of government, often against the backdrop of crises, in implementing effective reforms.

We also discuss some of the obstacles to implementation of the OECD *Jobs Strategy*. Some of the medicine prescribed under the OECD recommendations is bitter and hard for many countries to swallow, especially insofar as it appears to raise concerns about equity and appears to threaten some of the rents and privileges of insiders. As a result, there is natural tendency in many countries to delay needed reforms in certain areas and/or to search for alternative, sweeter remedies.

It requires strong political will and leadership to convince electorates that it is necessary to swallow all the medicine, and that it will take time before this treatment leads to improved labour market performance and falling unemployment. But the success stories show that it can be done.

## Appendix A. OECD indicator of structural unemployment

The OECD indicator of structural unemployment is based on the notion of a non-accelerating wage rate of unemployment, *NAWRU*. Estimates are derived under the assumption that changes in wage inflation are proportional to the gap between actual unemployment and the *NAWRU*:

$$D^2 \log W = -a \cdot (U - \text{NAWRU}), a > 0, \quad (\text{A1})$$

where  $D$  is the first-difference operator, and  $W$  and  $U$  are levels of wages and the unemployment rate, respectively. Using consecutive observations, and assuming the *NAWRU* to be constant between two consecutive years, an estimate of  $a$  can be calculated as:

$$a = -D^3 \log W / DU \quad (\text{A2})$$

which yields an estimate of the *NAWRU* as

$$\text{NAWRU} = U - ((DU / D^3 \log W) \cdot D^2 \log W). \quad (\text{A3})$$

Conceptually, the *NAWRU* estimated in this way is a short-run concept, i.e., it indicates the unemployment rate which, in a given year and based on the *actual* history of unemployment, would be associated with a constant rate of nominal wage increases.<sup>31</sup> In practice, the OECD indicator of structural unemployment takes into account not only the (suitably smoothed) mechanical estimates based on the above method but also the views of country experts (Giorno et al., 1995).

<sup>31</sup> In the presence of speed-limit effects or slow adjustment, a lower (or higher) unemployment rate may be associated with stable wage inflation in the long run, but this unemployment rate cannot be reached in the short term without setting off changes in inflation.

## Appendix B. The empirical analysis

Table B.1 shows basic characteristics of variables used in the regression analysis in Tables 2 and 4. More details are in Scarpetta (1996).

**Table B.1. Basic characteristics of the variables used**

Variables	Averages of values over the 1983-95 period				No. of countries
	Mean	Standard deviation	Minimum	Maximum	
UR	7.96	4.23	1.46	22.60	19
ALMPU	14.03	16.29	3.11	78.94	19
UB	29.77	12.92	0.35	70.97	19
EPL	6.88	4.34	0.36	14.25	19
UDENS	41.44	20.09	8.83	91.00	19
GAP	-0.29	2.50	-7.88	8.72	19
TWEDGE	38.39	9.40	17.70	54.51	19
MINWAGE	47.57	10.12	29.33	65.34	9

Acronym	Explanation
UR	For all countries but Denmark (administrative data), the OECD standardised unemployment rate.
ALMPU	Public expenditures for active labour market programmes per person unemployed relative to GDP per capita (in per cent).
UB	The OECD summary measure of benefit entitlements that is computed as the average of unemployment benefit replacement rates for two earnings levels, three family situations, and three duration categories.
EPL	Index of the strictness of employment protection legislation (see below).
UDENS	The proportion of workers who are members of a trade union (in per cent).
GAP	Output gap = $[(A_o/T_o)-1] \cdot 100$ ; where $A_o$ is actual output and $T_o$ is trend output computed by applying the Hodrick-Prescott filter to actual output.
TWEDGE	The total value of employers' and employees' social security contributions and personal income tax paid divided by gross earnings plus employers' social security contributions.
MINWAGE	Gross statutory minimum wage relative to the average wage.

### **Negotiating levels and co-ordination in collective bargaining arrangements**

The collective bargaining structure of each OECD country was assessed on the basis of the union density index (the proportion of workers who are member of a trade union) and indicators of the predominant level of wage bargaining and the level of co-ordination among employers, on the one hand, and among trade unions, on the other hand. Moreover, we also used a summary measure that considers both the degree of centralisation and the degree of co-ordination in bargaining.

Three dummies were created to capture the level of centralisation, co-ordination or the summary measure (1 = low; 2 = intermediate; 3 = high).<sup>32</sup> The reference group in the tables of the main text includes countries with low levels of centralisation and co-ordination. The summary measure of centralisation/co-ordination was computed on the basis of the values assigned to the two individual indexes, considering the degree of centralisation first, and then the degree of co-ordination. In countries with decentralised wage bargaining, it was assumed that different degrees of co-ordination did not significantly modify the potential labour market outcomes: wages were still considered to be predominantly determined by firms' conditions. But co-ordination was considered crucial in the case of intermediate (sectoral) wage bargaining: each bargaining unit could generate dis-employment effects if the decisions of employers' associations and sectoral trade unions are not well co-ordinated. Finally, high centralisation is generally accompanied by a high degree of co-ordination and countries in this group were considered as highly centralised/co-ordinated.

The distribution of countries according to the three measures and the changes over the period covered by our data are in Table B.2. It should be stressed that the indicators in Table B.2 are intended to summarise the broad trend in the degree of centralisation and/or co-ordination in each country and cannot fully account for repeated changes in a short time period, such as the zigzag path toward decentralisation observed in some Nordic countries.

<sup>32</sup> The classification proposed is based on recent OECD publications, including the 1995 and the 1997 issues of the OECD *Employment Outlook* (chapter 5 and chapter 3, respectively) and the special chapters on implementing the *Jobs Strategy* in the OECD Economic Surveys.

Table B.2. Country groupings—according to degree of ...

Country	Centralisation	Co-ordination
US	1	1
Japan	1	3
Germany	2	3
France	2	2
Italy	1; 3 since 1992	2; 3 since 1992
UK <sup>a</sup>	2; gradually to 1	1
Canada	1	1
Australia	2; 1 since 1988	2; 1 since 1988
Austria	2	3
Belgium	2	2
Denmark	3; gradually 2	3
Finland <sup>b</sup>	3; gradually to 2	2
Ireland	2	2; 3 since 1988
Netherlands	2	2; 3 since 1982
New Zealand	2; 1 since 1991	1
Norway	3	3
Portugal	2	2
Spain	2	3; 2 since 1987
Sweden	3; gradually 2	3; gradually 1 in the 1980s and back to 2 in 1991-95

*Notes:*

<sup>a</sup> In the UK, there has been a gradual move toward company-level pay setting. In the empirical analysis, it was assumed that by the end of the 1980s the UK was among the decentralised group of countries.

<sup>b</sup> In Finland, economy-wide bargaining agreements set guidelines rather than binding provisions, and sectoral unions have often, and increasingly over time, deviated from these guidelines. In the empirical analysis, it was assumed that in the second half of the 1980s, Finland was among the intermediate group of countries.

## ...centralisation/co-ordination (1=low; 2=intermediate; 3=high)

Summary measure of centralisation/co-ordination	Comments
1	
1	
3	
2	
1; 3 since 1992 2; gradually to 1	Income policy accords of July 1992 and July 1993
1	
2; 1 since 1988	Industrial Relations Act of 1988 followed by the Industrial Reform Act of 1993, that created a formal system of enterprise bargaining
3	
2	
3	Move toward decentralised bargaining but with a strong degree of co-ordination
3; gradually to 2 2; 3 since 1988	Tripartite three-year national pay agreements since 1988
2; 3 since 1982	Wassenaar Agreement, 1982, which set tripartite negotiations at national level on pay increases
2; 1 since 1991	Employment Contracts Act of 1991
3	
2	
3; 2 since 1986	Up to 1986 national tripartite accords
3; gradually 2	In 1983, the engineering industry employer association and metal workers broke away from economy-wide negotiations; 1989 last central agreement for non-manual workers (SAF-PTK); 1991 and 1993 tripartite agreements.

### **Changes in employment protection legislation (EPL)**

The summary measure of EPL is the average of two indices measuring the strictness of EPL rules for regular and fixed-term contracts, as presented in Tables 6.5 and 6.6 in OECD (1994b). In particular, the two indices are country rankings based on the average of scores assigned to several key elements characterising regular and fixed-term contracts, respectively. Since this classification was made, there were significant changes in the EPL of several OECD countries, including Germany, France, the UK, Australia, Denmark, Portugal and Spain (see OECD, 1997b). These changes were considered, using the following procedure: (1) the country scores for each of the key elements of regular and fixed-term contracts were re-evaluated on the basis of the observed changes; (2) the overall country scores for regular and fixed-term contracts were re-calculated; and, (3) the summary EPL indexes were recalculated taking into account (for the countries with changes in EPL) how their new summary scores compared with those of countries that had no changes.

In other words, the original ranking presented in OECD (1994b) was used as a benchmark; each country whose EPL had changed was assigned a position in the new ranking similar to the country with the closest summary score. Along these lines, Germany had only a marginal change that did not modify its position in the overall country ranking. France moved gradually to a more restrictive EPL from 1989 (the index rose from 9.5 to 11.5 in 1995). The UK moved to a slightly less-restrictive EPL (the index fell from 2.25 to 2 in 1993). Australia moved firstly to a more restrictive EPL in 1993 (from 3.26 to 4) and then in the opposite direction in 1994 (from 4 to 3.5). Denmark moved to a somewhat more restrictive EPL in 1994 (from 3.25 to 3.5). Portugal moved to ease its very strict EPL slightly in 1989 and 1991 (from 12.5 to 11.5 and 11).

### **Testing for reverse causality**

To explore the possibility of reverse causality, Granger causality tests were run between, on the one hand, unemployment and, on the other hand, the generosity of unemployment benefits and the size of the tax wedge. The tests obviously had to be restricted to the variables that vary over time. Keeping this caveat in mind, the results in Table B3 do not give strong backing to the hypothesis of reverse causation. But there are a few exceptions. Thus, unemployment may have led changes in benefit generosity in Belgium, France and Italy.

**Table B.3 Testing for reverse causality  
(F-statistics of the Granger causality tests, 1970-1995)<sup>a</sup>**

Country	Test of the hypothesis that unemployment does not Granger-cause	
	Benefit generosity	Tax wedge
Australia	0.47	0.58
Austria	0.59	4.90**
Belgium	8.29***	1.32
Canada	0.95	0.53
Denmark	0.91	0.49
Finland	0.54	2.42
France	5.98***	0.68
West Germany	1.13	1.45
Ireland	0.74	5.23**
Italy	9.47***	1.51
Japan	2.43	0.75
Netherlands	3.11*	0.16
New Zealand	0.18	1.63
Norway	0.07	3.89**
Portugal	0.93	1.98
Spain	0.48	0.74
Sweden	0.14	0.74
UK	3.62**	0.17
US	3.56**	0.02

*Notes:*

\* = Statistically significant at 10% level

\*\* = Statistically significant at 5% level

\*\*\* = Statistically significant at 1% level

<sup>a</sup> F-statistics of the relevant hypotheses. Different lag structures of the dependent and independent variables were used to maximise the efficiency of the estimates and obtain white-noise residuals.

The hypothesis that unemployment does not lead benefit generosity is also rejected for the UK and the US; in the latter, this result may reflect the regular practice of extending benefit duration from 26 to 39 weeks during periods of recession. Similarly, the hypothesis that unemployment does not lead changes in the tax wedge is rejected for Austria, Ireland, and Norway. Here, rejection does not necessarily imply a political-economy link, but could just reflect the normal economic mechanism that as unemployment changes, government budgets are affected and tax changes may be enacted in response.

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## Labor Market Flexibility as a Determinant of FDI Inflows

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### Abstract

This paper shows that labor market flexibility, measured by labor market standards and regulations, has two opposing effects on FDI inflows. Labor market regulations and standards decrease FDI inflows through the cost channel, but they increase FDI inflows through the productivity channel. Allowing for a non-linear relationship between different indicators of labor market flexibility and FDI inflows revealed that some degree of labor market standards and regulations may be attractive for foreign investors. Results strongly suggest that foreign investments to and from different countries and in different sectors are affected differently by different aspects of labor market standards and regulations.

**Key Words:** foreign direct investment, labor market flexibility  
**JEL Classification:** F16, F21

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## I. Introduction

Globalization of production and more open economies have expanded the decision range of profit-maximizing firms on where to conduct business. A large portion of the literature on foreign direct investments (FDI) has examined the various determinants of FDI location. Some determinants of FDI location such as market size and distance are beyond the influence of policymakers in host countries. However, some institutional determinants such as tax and investment incentive structures are more malleable. One often-overlooked institutional determinant is the flexibility of the labor market. Labor market standards and regulations or any limitation placed on employment lead to labor market rigidity, which imposes costs on firms. Hence, a profit-maximizing firm would most likely want to locate in countries with more flexible labor markets. In addition, flexible labor markets afford firms more freedom to adjust to prevailing economic conditions. Therefore, it seems reasonable to assert that countries with rigid labor markets will have less FDI inflows. While the mainstream literature argues that a highly regulated labor market impose additional cost on firms, which may deter FDI inflows, another strand of the literature has claimed that a highly regulated labor market may help enhance labor relations and increase labor productivity. Moreover, by providing job security, labor market standards and regulations can add to social stability. And these attract FDI inflows.

While existing studies find *either* a positive or negative relationship between labor market flexibility and FDI inflows, no study has yet reconciled these two opposing effects, which I attempt to do in the current study. First, I present the simple model of Dewit, Gorg, and Montagna (2003) to demonstrate that labor market flexibility can have two opposing effects on the expected profit of a multinational company (MNC), and thus on the motivation of the latter to invest in other countries. I augment this simple model to show that the impact

of labor market flexibility on FDI inflows is ambiguous and not clear cut positive or negative as suggested by previous studies. Then, in my empirical specification, I allow for a non-linear relationship between labor market flexibility and FDI inflows. Previous studies have simply assumed that the relationship between the two is linear. Hence, when a negative relationship is found, the immediate policy implication is that countries should reduce their labor market standards and regulations to increase flexibility and therefore attract more FDI. However, when the possibility of non-linear effects is recognized, it may reveal that some degree of standards and regulations is valued by foreign investors and that it is only high degrees of standards and regulations that repels FDI. Thus, allowing for non-linearities can help reconcile the two opposing effects of labor market flexibility on FDI inflows.

Apart from the aforementioned, this study aims to contribute to the labor market-FDI literature in other ways. First, I use the International Labor Organization (ILO) Conventions that specifically pertain to hiring, at work, and firing standards to construct a simple measure of labor market flexibility. This is in contrast to previous studies that have used either the total number of ILO conventions ratified by each country or ILO conventions on workers' basic rights. In addition, I use the labor market flexibility indexes constructed by the World Bank (WB) from a survey of business people in over 150 countries. These indicators have not been previously used in the FDI-labor market flexibility literature. In contrast to previous studies that have used a single index to measure labor market flexibility, these indicators are disaggregated into hiring, hours at work, and firing regulations. Thus, it is easy to distinguish which among these labor market regulations are actually significant to foreign investors. I use the ILO conventions as a proxy for labor market standards and the WB indexes for labor market regulations. All countries may decide to observe the same standards, but may

implement them using different regulations. Hence, WB indicators represent the actual market conditions faced by firms.

Second, I verify whether the impact of labor market flexibility on FDI inflows matter more for developing than developed countries. Previous studies have investigated this possibility, but on a limited number of countries. I expanded the number of countries to test the robustness of previous studies' findings. In addition, most studies have pooled developed and developing countries, which I deem inappropriate.<sup>1</sup> Since FDI inflows to developed and developing countries have different motivations, this suggests that foreign investors may respond differently to labor market flexibility in different types of countries.

Finally, I test which of the two countries' MNCs – Japan or US, are more sensitive to labor market standards and regulations when choosing a host country for their FDI. This may be important especially for countries aiming to attract FDI particularly from these two countries. I disaggregate Japanese and US FDI by the recipient country level of development and by sector (manufacturing and non-manufacturing).

## **II. FDI-Labor Market Flexibility Literature**

The literature on FDI determinants has been motivated by theories of international business, which are firm-based; and by international trade, which is based on general equilibrium models. The former points to the OLI framework developed by Dunning (1977, 1981, and 2001), which argues that three conditions must be satisfied for FDI to occur: the firm must have both an ownership (O) and an internalization (I) advantage, and the host country must offer a locational (L) advantage. Both ownership and internalization advantages depend on the firm, while locational advantage depends on the host country. When potential

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<sup>1</sup> This was earlier shown by Blonigen and Wang (2004).

countries are being considered by a MNC to host its FDI, the latter will choose based on the locational advantages offered by the former.

The OLI framework complements the more formal general equilibrium models used to explain FDI location, which is based on factor endowment differences, market sizes, and trade costs. The significance of these factors typically depends on whether FDI is of the horizontal or vertical type, as shown by general equilibrium models of Markusen (1984, 1995), Helpman (1984), Brainard (1993, 1997), Markusen and Venables (1995), Carr, Markusen, and Maskus (2001), and Markusen and Maskus (2001).

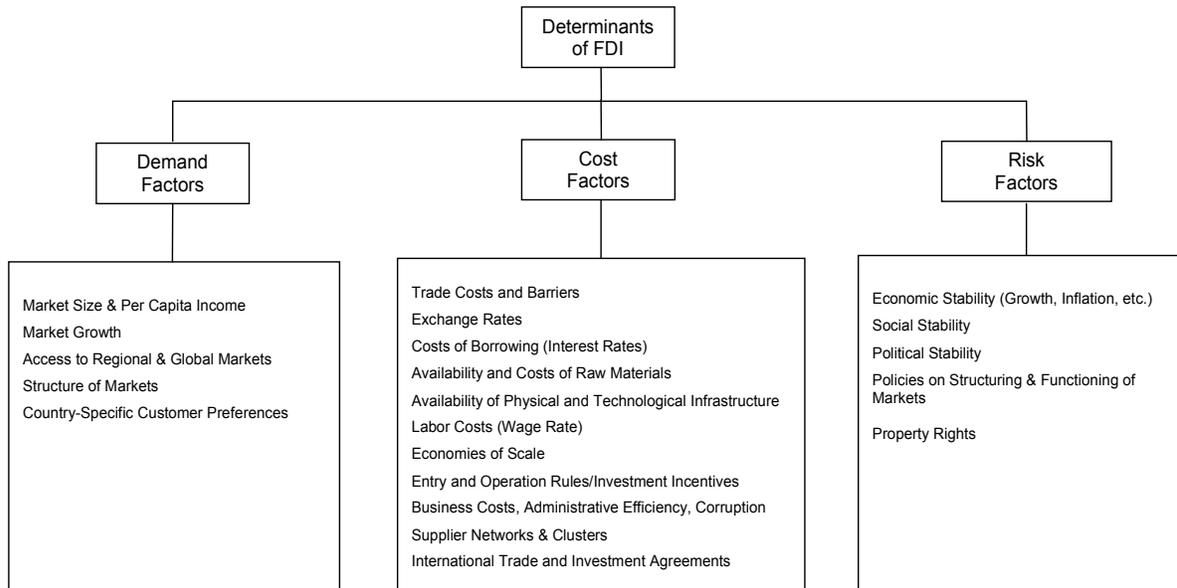
The two approaches in studying FDI determinants have produced a plethora of empirical work on FDI determinants at the firm and country level. These studies have considered various host country characteristics that may influence FDI inflows.<sup>2</sup> Figure 1 presents a classification of the various determinants identified in the literature. These factors may be divided into non-policy and policy factors. Non-policy factors would include market size, distance, relative factor endowments, economic growth, and risk/uncertainty. Policy factors meanwhile would include tax structure, investment incentives, product FDI restrictions, participation in trading agreements, and tariff regime.<sup>3</sup> An often overlooked policy factor is the labor market flexibility of the host country. This factor can be considered vital in the choice of FDI host country because an entire production process (for the case of horizontal FDI) or a part of it (for the case of vertical FDI) is left to the hands of the host country labor force.

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<sup>2</sup> Chakrabarti (2001) have pointed out that some of these empirical studies form examples of ‘measurement without theory,’ as variables are searched for that show a significant influence on FDI and the relationship is explained *ex post*.

<sup>3</sup> See Whyman and Baimbridge (2006), Blonigen (2005), Nicoletti et al. (2003), and Yeyati, Stein, and Daude (2002) for a more detailed review of these factors.

Figure 1. Determinants of FDI



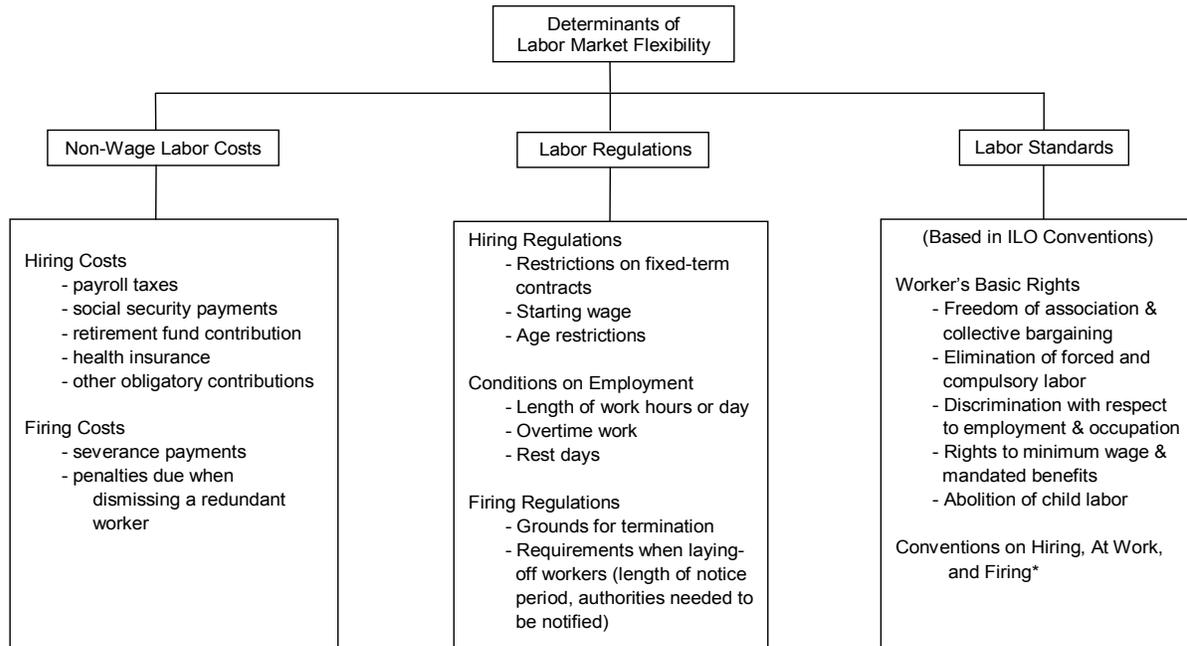
Source: Adopted by the author from Whyman and Baimbridge (2006)

According to Whyman and Baimbridge (2006), labor market flexibility refers to the degree to which labor market outcomes are determined by the operation of market forces free from rigidities and/or restrictions imposed by powerful actors such as the government, trade unions, and monopsony employers. Thus, a perfectly flexible labor market would imply the absence of all hindrances to the free operation of market forces. However, labor market standards, regulations, and non-wage labor costs prevent labor market outcomes to be freely determined by market forces. Figure 2 presents the various factors affecting labor market flexibility.

The literature on labor market effects on FDI inflows has mostly focused on the impact of labor cost as part of the firm's production cost. These studies frequently use average wage rate<sup>4</sup> and unit labor costs as measures of labor costs. While results of most

<sup>4</sup> Manufacturing wage rate is mostly used.

Figure 2. Determinants of Labor Market Flexibility



Note: \* - See Appendix Table 1.

Source: Compiled by the author from various studies

studies (Bellak et al. (2007), Fung et al. (2002), Cheng and Kwan (2000), Lucas (1993), Culem (1988), Schneider and Frey (1985), Flamm (1984)) conform to the mainstream literature that higher wages discourage FDI inflows, some studies found wages to be insignificantly and even positively related to FDI inflows (Owen (1982), Gupta (1983), Wheeler and Mody (1992)). What is common in these studies is that labor cost is usually measured using wage labor only. This may be reasonable since a large fraction of labor costs is composed of wage cost. However, this neglects the fact that labor cost consists of both wage and non-wage costs, where the latter includes hiring and firing costs. Of the studies that have considered the non-wage components of labor costs, the focus is mostly on European countries where non-wage costs are high relative to other countries. According to Whyman and Baimbridge (2006), the OECD Economic Outlook (2003), Buckley and Casson (1998),

and Moran (1998), a quarter to about one-third of total labor costs in European countries are non-wage costs. In addition, more studies have focused on firing than hiring costs. A possible reason for this is that hiring costs may be compensated by a reduction in wages in the long-run.<sup>5</sup> However, the same adjustment cannot be made for firing costs. The reason for this is that the firm may be faced with future uncertainties that may force it to unexpectedly lay-off employees or even exit the market. Since it is difficult to factor in all future uncertainties when a firm makes investment decisions, firing costs cannot really be planned ahead and therefore cannot be compensated with lower wages. Similarly, for studies using labor market regulations as an indicator of labor market flexibility, more studies have focused on firing than hiring regulations. There are likewise a considerable number of studies that have focused on regulations during the period of employment. As seen from Figure 2, conditions during the duration of employment and firing regulations constrain the ability of firms to easily respond to changes in market forces.

Bellak et al. (2007) included hiring costs (employers' contributions to social security and to contractual and private benefit plans) in their measure of total labor costs. Using a sample of selected European Countries, a negative and significant effect of total labor costs on FDI inflows was found. However, it is hard to tell whether hiring costs really made a significant impact because it was not separated from total labor cost. Haaland, Wooton, and Faggio (2003) theoretically demonstrated that firing costs, in particular severance payments, deters potential investment especially in risky industries. Though the empirical test verified the theoretical result, this study cannot offer generalizations since the model was tested on only three countries, namely, Romania, Poland, and Bulgaria. Covering a wider group of

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<sup>5</sup> However, if minimum wage laws exist, then the shifting of non-wage costs to wages may only be partial. (OECD Economic Outlook, 2003)

OECD countries, Lee (2003) used an EPL (employment protection legislation) index<sup>6</sup> to show that labor market regulations have a strong negative impact on FDI inflows. However, the EPL index is limited since it simply averages the level of employment protection under a regular and a temporary contract. Gorg (2005) focused on the impact of labor market flexibility on US FDI in 33 host countries. He similarly found that countries with more liberal labor markets receive more FDI from the US. The study likewise revealed that the impact of labor market restrictions on US FDI inflows is the same regardless of the host country's level of economic development and economic risk/uncertainty. The labor market flexibility indicator used in this study is a single index that is based on a survey of managers across countries conducted by the World Economic Forum and published in the Global Competitiveness Report. The question asked on this survey is 'whether hiring and firing practices are too restricted by the government or are flexible enough'. An obvious drawback of this index is that it averages the effects of all hiring and firing practices. Thus, it is uncertain which of the two drives the result. Likewise, response to the survey question is likely to be subjective.

Non-wage labor costs and regulations are driven by policy objectives that are unrelated to FDI. Most of these objectives arise with the aim of protecting the employee. It is for this reason that labor market regulations are usually associated with EPL. In addition, labor market regulations arise as outcomes of negotiations of contracts and incentives. Regardless of the exact reason why non-wage costs and labor market regulations exist, they have important implications on the cross-country distribution of FDI. The mainstream literature suggests that non-wage costs and labor market regulations negatively affect FDI inflows in a potential host country due to: (1) the decrease in MNC's returns due to higher

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<sup>6</sup> From Nicoletti, Scarpetta, and Boylaud (1999)

labor costs; and (2) the decrease in the capacity of the MNC to readily respond to supply and demand shocks.

One strand of the literature uses labor standards as an indicator of labor market flexibility. These studies usually use the ILO Conventions as indicators of labor market flexibility. Forteza and Rama (2001) argued that ratified ILO Conventions is a reasonable proxy for the rigidity of a country's labor market. In addition, Freeman (1993)<sup>7</sup> claimed that these conventions reflect the ideal regulatory framework from an institutionalist perspective, where employees are considered weaker than employers. Since ILO conventions restrict the ability of employers to decide on the terms and conditions of work, they are therefore seen as a source of labor market distortions. A number of studies have used ILO Conventions as indicators of labor market flexibility, namely, Rodrik (1995), Kucera (2001, 2002), Cooke and Noble (1998), and Daude, Mazza, and Morrison (2003).<sup>8</sup> Results of these studies mostly show that low labor standards might be a hindrance, rather than an attraction, for foreign investors. Moreover, these studies suggest that high labor standards facilitate human capital development and enhance political and social stability, which encourage FDI inflows.

The foregoing shows that labor market flexibility has numerous facets, which makes the exact relationship between labor market flexibility and FDI inflows harder to predict. In addition, the relationship between the two will be sensitive to the choice of labor market flexibility indicator used. Thus, depending on the indicator chosen, labor market flexibility can have two opposing effects on FDI inflows, as illustrated in Figure 3. On the one hand, labor market standards and regulations increase costs and decrease the ability of a firm to

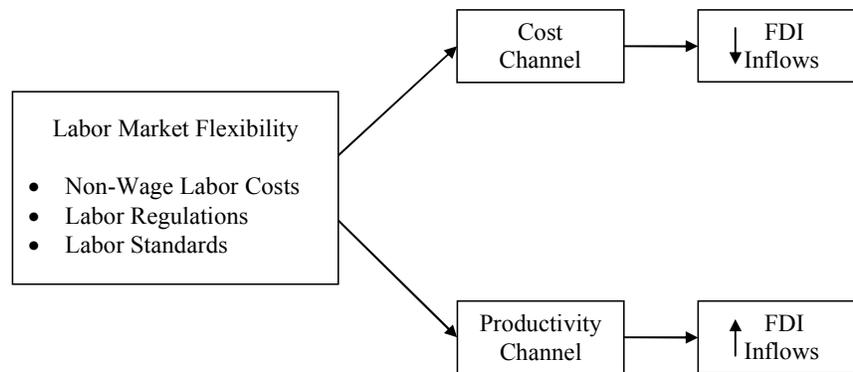
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<sup>7</sup> Cited in Forteza and Rama (2001)

<sup>8</sup> Rodrik (1995) used the total number of ILO conventions ratified; Kucera (2001, 2002), Cooke and Noble (1998), and Daude et al. (2003) used an index based ILO Conventions 87 (Freedom of Association and Protection of the Rights to Organize) and 98 (Right to Organize and Collective Bargaining).

respond to market changes, which deters FDI. On the other hand, labor market standards and regulations enhance labor productivity, which attracts FDI.

Figure 3. The Impact of Labor Market Flexibility on FDI Inflows



### III. Theoretical Framework

I use the simple theoretical model developed by Dewit et al. (2003) to demonstrate how labor market flexibility in potential FDI host countries can affect the choice of the MNC on where to locate. There are two types of countries in the model, home and foreign, which are assumed to have the same production costs. Dewit et al. (2003) argued that the symmetric cost assumption allows the model to focus on employment regulations as the sole motivation for location choice of the firm. However, under this assumption, there will be no motivation for vertical FDI, which mainly occurs to take advantage of differences in production costs between home and foreign country. Therefore, I slightly altered the assumption of the model by assuming that the choice of the MNC is among potential FDI host countries. This would accommodate both horizontal and vertical FDI. Therefore, even if production costs are assumed the same between the potential host countries, if FDI is of the vertical type, then the

choice must be between countries that have the same lower production costs than the FDI source country. Furthermore, I assume that the profit-maximizing MNC in the home country has already recognized that it is optimal for it to invest in a foreign country, where horizontal FDI is motivated by market access and vertical FDI is motivated by cost advantage.

The firm is a monopolist that chooses among countries,  $C_1, \dots, C_n$ , as the host country for its FDI. There are two periods in the model. Demand in period 1 is known by the firm for certain, but demand in period 2 has some degree of uncertainty. Therefore, the inverse demand curves in periods 1 and 2 are given by  $p_1 = a - q_1$  and  $p_2 = a - q_2 + u$ , respectively, where  $p_t$  and  $q_t$  are the price and quantity in period  $t$  ( $t=1, 2$ ),  $a$  is a positive constant and  $u$  is a stochastic demand component, with mean  $E(u) = 0$  and variance  $v$ . Since the firm faces uncertainty in period 2, it values labor market flexibility. In the event of a decrease in demand in period 2, it has to cut its production, which means it may have to resort to cutting employment. Similarly, when demand increases in period 2, the firm wants to increase its production, which means it may want to increase employment. In either case, hiring and firing of employees can be costly, notably when the labor market is rigid.

The total variable cost in location  $i$  ( $i=1, \dots, n$ ) is given by:

$$(1) \quad \text{TVC}_i = c_i \sum_{t=1}^2 q_t + \frac{\lambda_i}{2} (q_2 - q_1)^2,$$

where  $c_i$  is the marginal cost of production in location  $i$ , which is assumed to be the same in both periods.  $\lambda_i$  is the degree of labor market inflexibility in location  $i$ . The higher  $\lambda_i$  is, the more stringent the labor market in location  $i$  is. When the firm decides to alter its output in period 2,  $|q_2 - q_1| > 0$ ; otherwise,  $|q_2 - q_1| = 0$ . Thus, the second term in (1) reflects the adjustment cost when output level is changed.

The fixed set-up cost in location  $i$  is given by:

$$(2) \quad FC_i = \phi + \delta_i,$$

where  $\phi$  is a constant fixed cost faced by the MNC regardless of the location chosen and  $\delta_i$  is a location-specific fixed cost.

To maximize expected total profits,  $E(\Pi) = \Pi_1 + E(\Pi_2)$ , the MNC chooses its optimal output in location  $i$  in each period given by:

$$(3) \quad q_{i1} = \frac{a - c_i}{2}$$

$$(4) \quad q_{i2} = \frac{a - c_i}{2} + \frac{u}{2 + \lambda_i}$$

Clearly, with uncertainty, the MNC will be more flexible in period 2 if  $\lambda_i$  is low, since

$\frac{dq_{i2}}{du} \left( = \frac{1}{2 + \lambda_i} \right)$  is decreasing in  $\lambda_i$ . If location  $i$  has an inflexible labor market (high  $\lambda_i$ ), the

MNC optimally chooses to adjust its period 2 output by a small amount in the face of uncertainty.

The maximized expected profit is given by:

$$(5) \quad E(\Pi_i) = 2 \left( \frac{a - c}{2} \right)^2 + \frac{v}{2(2 + \lambda_i)} - FC_i.$$

Therefore,

$$(6) \quad \frac{dE(\Pi_i)}{d\lambda_i} = -\frac{v}{[2(2 + \lambda_i)]^2} < 0.$$

This implies that the MNC will have greater expected profits when it chooses the location with more flexible labor market (low  $\lambda_i$ ). Thus, more FDI is expected to flow in location  $i$  as the expected profits in location  $i$  increase.

The foregoing illustrates how labor market regulations can constrain the decision of firms to respond readily to changes in the economic environment. A firm experiencing an

unexpected decrease in demand may decide to lay-off workers. However, doing so is not costless and may not be an easy process. The firm has to deal with regulations on notice period and severance payments. Similarly, when a firm unexpectedly experiences an increase in demand, even if it wants to increase employment of labor in response to the market change, hiring of new employees or increasing work hours will come at a cost. Hence, a MNC would have to take into account the state of the labor market in their choice of host country. When labor markets have stringent regulations, they are considered less flexible since they cause firms to slow down the reallocation of their resources in response to market changes, which in turn can be costly for firms.

What the preceding does not show, however, is that labor standards and regulations, though restrictive from the point of view of firms, exist to protect the interest of workers. For instance, if there were no restrictions on work hours and overtime pay, a firm can just require its existing employees to work for longer hours to meet an increase in demand for its good and just pay the regular hourly wage for the additional hours of work. Beyond some number of work hours, however, this practice may be considered exploitative. In addition, labor standards may be established to promote long-lasting work relationships and provide job security. For instance, firms may respond to the rigidity in the labor market by training employees in various functions, which increases within firm or internal flexibility. This reduces the cost associated with hiring and firing of workers. Moreover, if firms provide more employment protection, they may find that their workers are more loyal and hard-working. High labor standards may likewise encourage human capital development. An example is the ILO Convention on paid educational leave, which increases the cost of employers, but enhances human capital development. Social stability may likewise result from the job security that certain labor standards and regulations provide. Therefore, labor

regulations and standards can actually have a positive impact on FDI inflows by enhancing the aggregate labor productivity of a country. If this is the case, it is possible for certain labor market regulations and standards to decrease the marginal cost of production in location  $i$ , that is,  $c$  can be a negative function of  $\lambda$ . Thus, (5) and (6) can be alternatively written as

$$(5') \quad E(\Pi_i) = 2\left(\frac{a - c(\lambda)}{2}\right)^2 + \frac{v}{2(2 + \lambda_i)} - FC_i$$

$$(6') \quad \frac{dE(\Pi_i)}{d\lambda_i} = -\left(\frac{a - c(\lambda)}{2}\right)c'(\lambda) - \frac{v}{[2(2 + \lambda_i)]^2} > 0.$$

where  $c'(\lambda) < 0$ . The first term in (6') represents the positive impact of labor market regulations and standards on the MNC's expected profits due to increased labor productivity that decreases the marginal cost of production. The second term, meanwhile, represents the negative impact of labor market regulations and standards on the MNC's expected profits due to adjustment costs incurred by the firm when it changes its production decisions as a result of market uncertainties. Thus, the sign of  $\frac{dE(\Pi_i)}{d\lambda_i}$  is ambiguous, depending on which effect

dominates. Based on the foregoing, I hypothesize that labor market flexibility can influence the cross-country differences in FDI inflows through two channels: costs and productivity.

***Hypothesis: An increase in labor market inflexibility will decrease FDI inflows through the cost channel and will increase FDI inflows through the productivity channel.***

#### IV. Empirical Methodology and Data

To empirically test whether labor market flexibility has a significant impact on cross-country differences in FDI inflows, the following equation will be estimated:

$$(7) \quad \log(\text{FDI}_{ji}) = \alpha + \beta \text{LM}_i + \gamma X_i + \varepsilon_{ji},$$

where FDI inflows from source  $j$  to country  $i$  is regressed on a measure of labor market flexibility (LM) of country  $i$  and other country  $i$  characteristics,  $X_i$ , known to affect FDI inflows.  $\beta$  is the coefficient of interest and  $\varepsilon$  is a random error term. Stated in this manner, (7) is a reduced form representation of the FDI-labor market flexibility relationship. Whether labor market flexibility has a positive or negative impact on FDI inflows depends on the net impact of the former on the expected profits of the MNC.

Equation (7) assumes a linear relationship between labor market flexibility and FDI inflows. When labor market standards and regulations are used as indicators of labor market flexibility and when a negative effect on FDI inflows is found, the outright conclusion is that labor market flexibility should be increased by reducing standards and regulations in order to attract more FDI inflows. And when a positive relationship is found, the explanation given for the seemingly surprising result is that labor market standards and regulations increase labor productivity. Thus, standards and regulations should be encouraged in order to attract more FDI inflows. Note that when only a linear relationship is assumed, the relationship between labor market flexibility and FDI inflows could only be either positive or negative at all levels of labor market standards and regulations.

The theoretical model presented in the preceding section recognizes that labor market standards and regulations may reduce the marginal cost of production by increasing aggregate labor productivity. At the same time, labor standards and regulations increase the total variable cost faced by a MNC when an adjustment needs to be done in response to market uncertainties. To allow for these two possible channels, I add a squared term for the labor market flexibility indicator. Hence, equation (7) becomes

$$(7') \quad \log(\text{FDI}_{ji}) = \alpha + \beta_1 \text{LM}_i + \beta_2 \text{LM}_i^2 + \gamma X_i + \varepsilon_{ji}.$$

There are several possibilities in the signs of  $\beta_1$  and  $\beta_2$ .

First,  $\beta_1 > 0$  and  $\beta_2 < 0$ . This implies that labor market standards and regulations increase FDI inflows at a decreasing rate. If this case holds, then this would suggest that some degree of labor market standards and regulations is helpful in attracting FDI inflows. But higher levels of regulation will be too costly and eventually ward off investors. This case may likewise suggest that the productivity effect of standards and regulations can have a diminishing effect on FDI inflows.

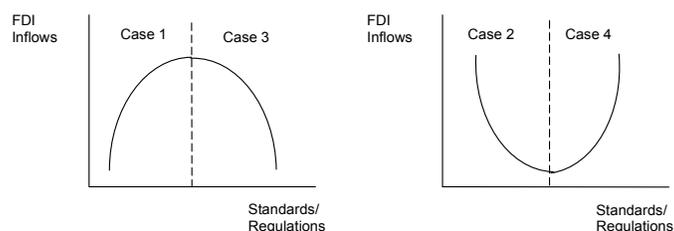
Second,  $\beta_1 < 0$  and  $\beta_2 > 0$ . This implies that labor market standards and regulations decrease FDI inflows at a decreasing rate. If this case holds, the marginal increase in costs becomes smaller as standards and regulations increase; that is, the negative impact of regulations will have a diminishing effect on FDI inflows.

Third,  $\beta_1 < 0$  and  $\beta_2 < 0$ . This implies that labor market standards and regulations decrease FDI inflows at an increasing rate. If this case holds, then the cost channel dominates the productivity channel.

Fourth,  $\beta_1 > 0$  and  $\beta_2 > 0$ . This implies that labor market regulations increase FDI inflows at an increasing rate. If this case holds, then the productivity channel dominates the cost channel.

The aforementioned cases are illustrated in Figure 4. The four cases suggest that the impact of labor market regulations on FDI inflows depends on whether a country has high or low levels of standards or regulations and on which of the two channels is more dominant.

Figure 4. The Non-linear Effects of Labor Market Standards/Regulations on FDI Inflows



On the choice of labor market flexibility indicator, I depart from previous studies in two ways. First, I do not use the total number of ILO conventions or number of ILO conventions pertaining to workers' basic rights ratified by each country as an indicator of LMF. Using the total number of ILO conventions ratified as an indicator of LMF is inappropriate since the conventions cover a wide variety of employment regulations. I choose only ILO conventions that specifically pertain to *hiring, at work, and firing standards*. Appendix Table 1 summarizes the conventions classified under each category. I do not aggregate the conventions covering these three categories in order to distinguish which among the three is most important for foreign investors. Moreover, rather than simply obtaining the number of conventions ratified by each country under each category, I consider the number of conventions ratified by each country  $i$  relative to the maximum possible number of regulations for each category  $k$  (where  $k = \text{hiring, at work, firing standards}$ ) for each year  $t$ , that is,

$$k \text{ index}_{it} = \frac{(\text{Number of ILO Ratifications for Category } k)_{it}}{(\text{Total Number of ILO Ratifications for Category } k)_t} \times 100.$$

The larger the index is, the greater are the number of conventions ratified by a country. For instance, in 1992, 21 ILO Conventions were classified under at work category. Of these conventions, Australia has ratified only one. Thus, at work index for Australia for 1992 is  $(1/21) \times 100$  or 4.80. In 1993, an additional convention under at work category was introduced,<sup>9</sup> but Australia did not ratify the convention. Hence, at work index for Australia in 1993 went down to  $(1/22) \times 100$  or 4.50. Thus, if a convention is not ratified by a country in a given year, the index will decrease for the country. If no convention is introduced by the ILO in a given year, then the indexes remain the same for all countries. An exception happens

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<sup>9</sup> Convention No. 174 (Prevention of Major Industrial Accidents)

when a country denounces a previously ratified convention. For instance, Brazil ratified Convention No. 158 (Termination of Employment) in 1982, but denounced the convention in 1996. Hence, though no convention was ratified in 1996, the firing index for Brazil decreased from 20 in 1995 to 0 in 1996.

Second, I use various labor market flexibility indicators obtained from the *Doing Business* Database of the World Bank (WB). The indicators focus on the regulation of employment, specifically the hiring and firing of workers and the rigidity of work hours. They were based on a survey that started in 2003, which was conducted on various firms in over 150 countries. To make the data comparable across countries, the survey was designed to reflect the employment regulation enforcement across countries. Thus, in contrast to the ILO indicators which represent the labor standards countries agreed in principle to observe, the WB indicators represent the actual regulations faced by investors in different countries. Specific assumptions about the worker and the business were provided in the survey and respondents were asked to answer based on the given assumptions and the existing labor regulations in the country.<sup>10</sup> Hence, subjectivity of responses is eliminated, in contrast to other indicators of labor market flexibility. Out of the survey, the database provides a rigidity of employment index (REI), which is a weighted average of the difficulty of hiring index (DHI), rigidity of hours index (RHI), and difficulty of firing index (DFI). Higher values of the indexes indicate more rigid regulation. A summary of the components of the indexes is provided in Appendix Table 2.

Compared to single aggregate indexes used in previous studies, the disaggregation of the ILO Conventions and the WB's rigidity of employment index into different components is appealing. The disaggregated indicators enable one to see whether the impacts of the

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<sup>10</sup> A copy of the actual questionnaire can be downloaded from <http://www.doingbusiness.org/Methodology/>.

different categories of standards and regulations are equally significant for foreign investors. However, as with any other indicator, both sets of labor market flexibility indicators have drawbacks.

Although the ILO actively monitors the observance of the ratified conventions, it does not have the legal power to penalize a nation from not observing a convention that it has ratified. The most that it can do is to rely on moral suasion. Hence, a limitation of using the ILO conventions as indicators of labor market flexibility is that they may just measure the latter as stated on paper and not necessarily in practice. Another drawback of the ILO Conventions is that whether countries ratify a convention or not may depend on its level of economic development. Appendix Table 3 summarizes the percentage of developed and developing countries with ILO and WB labor market flexibility indicators above and below the mean values of these indicators. The table reveals that a greater proportion of developed countries have ILO indexes above the mean. This implies that developed countries generally ratify more conventions than developing countries. This is most apparent for the firing index where 71 percent of developed countries have an index above the mean, while only 38 percent of developing countries have an index above the mean.

A more preferred indicator of labor market flexibility is one that does not only capture labor regulations as stated on paper, but which captures their enforcement and effect on firms' operations as well. The labor market flexibility indicators from the WB satisfy this characteristic. In addition, as seen in Appendix Table 4, compared to the ILO indexes, there seem to be no apparent correlation between a country's level of development and the WB indexes.<sup>11</sup> Hence, in these aspects the WB indicators are preferred over the ILO indicators. A

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<sup>11</sup> Although among the ILO indicators, only firing standards seem to be highly correlated with a country's level of development. Correlation between the developing country dummy and firing standards is -0.39, which imply that developing countries generally have lesser firing standards than developed countries.

drawback of using the WB labor market flexibility indicators, however, is that the values of the indexes do not change for any country for the period covered by the survey.<sup>12</sup>

I proceed with the aforementioned limitations in mind. Both sets of labor market flexibility indicators will be used to estimate the impact of labor market flexibility on FDI inflows. Fixed effects technique is used to estimate equations (7) and (7') when the ILO indexes are used as indicators. Fixed effects estimation eliminates the effect of time-invariant omitted variables. Such estimation method can be used since the ILO indexes vary for countries for the period 1990-2005. However, fixed effects estimation cannot be used when the WB indexes are used as indicators since the indexes are time-invariant. Thus, when using the WB indexes, data is pooled across years for all 165 countries, where each country-year observation is treated as a single observation. Since I am only able to estimate a simple cross-country relationship between FDI inflows and labor market flexibility when using the WB indexes, there is always a risk that the correlations I document are spurious. To address this concern, I include various variables that the literature suggests are correlated with FDI inflows. This lessens the possibility that the LMF indicators will capture the effect of omitted variables. I likewise included dummy variables for each year to account for year effects.<sup>13</sup>

I consider three sources (j) of FDI, namely, the rest of the world (ROW), Japan, and the United States. A cursory inspection of the FDI data shows that all countries included in

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<sup>12</sup> Statistically, this is a limitation. In reality, not much can really be done about it since labor market regulations rarely change from one year to another. Since many regulations have to be passed into law before being implemented, it is necessarily expected that regulations will not change on an annual basis.

<sup>13</sup> Based on existing literature, the following explanatory variables are included in the estimations: wage and its square, GDP per capita and its square, trade as a percent of GDP, inflation rate, tax on goods and services, labor force participation rate, population, literacy rate, exchange rate, external debt as a percentage of GDP, capital account openness index, dummy variable whether the form of government is democratic or not, corruption index, manufacturing value added (included in estimation for the manufacturing sector), distance from US (included in estimation for US FDI), distance from Japan (included in the estimation for Japanese FDI), and dummy variables for membership in different preferential trading agreements (AFTA, NAFTA, COMESA, MERCOSUR, CARICOM, EU). Variance inflation factor was checked for each regression to ensure that there is no serious multicollinearity among the explanatory variables. Robust standards errors are also used to minimize the problem of heteroskedasticity.

the study have received FDI inflows from the ROW in the years covered by the study. However, not all countries have received FDI from Japan and US. Therefore, Tobit estimation is the appropriate method of estimation when considering FDI coming from US and Japan. Appendix Table 5 presents the description of variables and their corresponding sources. Appendix Table 6 presents the summary statistics of these variables.

## V. Results

Table 1A presents the results of the estimations using the constructed ILO indexes as the labor market flexibility indicators. Panel A lists the coefficients for the sample of all countries. Panels B and C, meanwhile, contain the coefficients for the developed and developing countries samples, respectively.

Panel A reveals that countries with more hiring and at work standards generally receive more FDI inflows. A 10 unit increase in hiring and at work indexes increases FDI inflows by about 7-11 and 14 percent, respectively, as seen in columns (1), (2), and (4). There is no discernable non-linear relationship between FDI inflows and the ILO standards. In addition, firing standards are statistically insignificant in affecting FDI inflows. The results for the developed countries sample are very similar to the pooled sample as seen in Panel B. Hiring and at work standards are statistically significant, but firing standards are not. A 10 unit increase in hiring and at work indexes will increase FDI inflows to developed countries by about 11-19 and 16 percent, respectively, as seen in columns (1), (2), and (4).

The result for the developing countries sample is quite different as revealed in Panel C. Hiring standards are only weakly statistically significant in affecting FDI inflows, while at work and firing standards are statistically significant in explaining FDI inflows. A 10 unit increase in at work index increases FDI inflows by about 14 percent, as seen in columns (2).

Table 1A. Impact of Labor Market Standards on FDI Inflows from the Rest of the World

Labor Market Flexibility Indicator	Panel A. All Countries					
	(1)	(2)	(3)	(4)	(5)	(6)
Hiring Standards	0.0073** (0.002)			0.0111** (0.004)		
(Hiring Standards) <sup>2</sup>				-0.0001 (0.000)		
At Work Standards		0.0146** (0.003)			0.0088 (0.009)	
(At Work Standards) <sup>2</sup>					0.0001 (0.000)	
Firing Standards			0.0023 (0.001)			0.0045 (0.003)
(Firing Standards) <sup>2</sup>						-0.0001 (0.000)
No. of Observations	2640	2640	2640	2640	2640	2640
F-statistic	17.54	18.08	17.34	17.08	17.59	16.88
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.2017	0.2066	0.1998	0.2019	0.2067	0.2000
Labor Market Flexibility Indicator	Panel B. Developed Countries					
	(1)	(2)	(3)	(4)	(5)	(6)
Hiring Standards	0.0119** (0.0039)			0.0191** (0.008)		
(Hiring Standards) <sup>2</sup>				-0.0001 (0.000)		
At Work Standards		0.0167** (0.004)			0.0202 (0.021)	
(At Work Standards) <sup>2</sup>					-0.0001 (0.000)	
Firing Standards			0.0011 (0.001)			-0.0001 (0.005)
(Firing Standards) <sup>2</sup>						0.0001 (0.000)
No. of Observations	656	656	656	656	656	656
F-statistic	10.68	10.86	10.28	10.41	10.54	9.98
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.3920	0.3959	0.3829	0.3930	0.3959	0.3830
Labor Market Flexibility Indicator	Panel C. Developing Countries					
	(1)	(2)	(3)	(4)	(5)	(6)
Hiring Standards	0.0053 (0.001)			0.0097* (0.005)		
(Hiring Standards) <sup>2</sup>				-0.0001 (0.000)		
At Work Standards		0.0142** (0.003)			0.0074 (0.010)	
(At Work Standards) <sup>2</sup>					0.0001 (0.000)	
Firing Standards			0.0031 (0.002)			0.0152** (0.005)
(Firing Standards) <sup>2</sup>						-0.0002** (0.023)
No. of Observations	1984	1984	1984	1984	1984	1984
F-statistic	11.56	11.94	11.55	11.26	11.61	11.40
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.1823	0.1870	0.1821	0.1826	0.1870	0.1844

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively. Coefficients estimates of other explanatory variables appear in Appendix Table 7.

A non-linear relationship is apparent between firing standards and FDI inflows. Developing countries with more firing standards will generally attract more FDI inflows such that a 10 unit increase in the firing index will increase FDI inflows by about 15 percent, as seen in column (6). However, when firing standards reach a certain level, FDI inflows will start to decrease. Developing countries with firing index below 32 will find that FDI inflows will still increase if firing standards are increased.<sup>14</sup> However, countries with firing index above 32 may find that increasing firing standards any further will decrease their FDI inflows. Of the 124 developing countries in the sample, only 19 countries have firing index above 32. Thus, my results suggest that most developing countries can still increase their firing standards sans the fear of repelling FDI inflows.<sup>15</sup>

The preceding results suggest that countries with higher labor market standards generally receive more FDI inflows, suggesting that MNCs value labor market standards in host countries. Moreover, results show that not all labor market standards have the same and significant effects on FDI inflows to developed and developing countries.

Table 1B presents the results of the estimations using the WB indexes as the labor market flexibility indicators. Again, Panels A, B, and C list the results for the pooled, developed, and developing countries samples, respectively.

Panel A, column (1) shows that based on the aggregate index – rigidity of employment, labor market regulations do not have a significant impact on FDI inflows. However, when this index is disaggregated into its components, regulations on work hours and firing have statistically significant impact on FDI inflows, as seen in columns (3) and (4).

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<sup>14</sup> This is calculated as  $(-\beta_1/2\beta_2)$ .

<sup>15</sup> For instance, the following developing countries have firing index below 32: Angola, Bangladesh, Cambodia, Cote d'Ivoire, Guatemala, Mongolia, Mozambique, Rwanda, and Vietnam; and the following have firing index above 32: Mexico, Madagascar, and Zambia.

Table 1B. Impact of Labor Market Regulations on FDI Inflows from the Rest of the World

Labor Market Flexibility Indicator	Panel A. All Countries							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rigidity of Employment	0.0004 (0.001)				-0.0081** (0.003)			
(Rigidity of Employment) <sup>2</sup>					0.0001** (0.000)			
Difficulty of Hiring		0.0010 (0.000)				0.0012 (0.001)		
(Difficulty of Hiring) <sup>2</sup>						0.0000 (0.000)		
Rigidity of Hours			0.0020** (0.000)				0.0028 (0.002)	
(Rigidity of Hours) <sup>2</sup>							-0.0000 (0.000)	
Difficulty of Firing				-0.0024** (0.000)				-0.0057** (0.002)
(Difficulty of Firing) <sup>2</sup>								0.0001 (0.000)
No. of Observations	2640	2640	2640	2640	2640	2640	2640	2640
F-statistic	39.32	38.94	0.3799	0.3908	38.39	37.91	37.53	39.19
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.3147	0.3153	0.3162	0.3171	0.3163	0.3153	0.3162	0.3177
Labor Market Flexibility Indicator	Panel B. Developed Countries							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rigidity of Employment	-0.0020 (0.002)				-0.0402** (0.008)			
(Rigidity of Employment) <sup>2</sup>					0.0005** (0.000)			
Difficulty of Hiring		0.0006 (0.001)				-0.0017 (0.004)		
(Difficulty of Hiring) <sup>2</sup>						0.0001 (0.000)		
Rigidity of Hours			-0.0022 (0.002)				-0.0453** (0.004)	
(Rigidity of Hours) <sup>2</sup>							0.0006** (0.000)	
Difficulty of Firing				-0.0032* (0.001)				0.0071 (0.006)
(Difficulty of Firing) <sup>2</sup>								-0.0002* (0.000)
No. of Observations	656	656	656	656	656	656	656	656
F-statistic	51.27	50.08	51.87	50.63	52.74	49.27	57.04	47.69
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.6420	0.6417	0.6425	0.6431	0.6577	0.6418	0.6983	0.6488
Labor Market Flexibility Indicator	Panel C. Developing Countries							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rigidity of Employment	-0.0032** (0.001)				-0.0104** (0.003)			
(Rigidity of Employment) <sup>2</sup>					0.0001* (0.000)			
Difficulty of Hiring		-0.0013* (0.000)				-0.0017 (0.001)		
(Difficulty of Hiring) <sup>2</sup>						0.0001 (0.000)		
Rigidity of Hours			0.0007 (0.001)				0.0141** (0.002)	
(Rigidity of Hours) <sup>2</sup>							-0.0002** (0.000)	
Difficulty of Firing				-0.0038** (0.000)				-0.0091** (0.002)
(Difficulty of Firing) <sup>2</sup>								0.0001** (0.000)
No. of Observations	1984	1984	1984	1984	1984	1984	1984	1984
F-statistic	27.07	27.01	26.75	27.65	26.58	26.32	27.05	27.22
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.2650	0.2635	0.2624	0.2697	0.2662	0.2635	0.2726	0.2715

Notes: Values in ( ) are standard robust errors. \*\* and \* indicate significance at 5% and 10% level, respectively. Coefficients estimates of other explanatory variables appear in Appendix Table 7.

A 10 unit increase in the rigidity of hours index will increase FDI inflows by 2 percent, while a 10 unit increase in the difficulty of firing index will decrease FDI inflows by 2.4 percent.

When a non-linear relationship is allowed between the labor market flexibility indicators and FDI inflows, the rigidity of employment index gains statistical significance as seen in column (4). A 10 unit increase in the rigidity of employment index decreases FDI inflows by about 8 percent. However, when the index is disaggregated into its components, there is no apparent non-linear relationship between FDI inflows and the disaggregated indexes as seen in columns (6) – (8).<sup>16</sup>

Panel B, columns (1)-(4) reveal that when only a linear relationship is allowed between labor market flexibility and FDI inflows to developed countries, the former is insignificant in explaining the latter.<sup>17</sup> A statistically significant relationship between labor market flexibility and FDI inflows in developed countries is strongly evident only when non-linear relationship is allowed, as seen in columns (5) and (7). A 10 unit increase in the rigidity of employment index decreases FDI inflows by about 40 percent, and this can be attributed to the rigidity of hours. A 10 unit increase in the rigidity of hours index decreases FDI inflows by about 45 percent. Thus, MNCs are discouraged to invest in developed countries with rigid work hour regulations, but are indifferent as regards hiring and firing regulations.<sup>18</sup>

Panel C shows that a 10 unit increase in the rigidity of employment index decreases FDI inflows to developing countries by about 3-10 percent, as seen in columns (1) and (5). Among the components of the aggregate index, the difficulty of hiring index is marginally significant, as seen in column (2). Both the rigidity of hours and difficulty of firing indexes

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<sup>16</sup> Squared term for difficulty of firing is insignificant.

<sup>17</sup> Difficulty of firing index in column (4) is only marginally significant.

<sup>18</sup> Firing regulations are only weakly statistically significant and the economic impact is quite small – 3 percent, as seen in column (4).

are strongly statistically significant. A 10 unit increase in the rigidity of hours index will increase FDI inflows by about 14 percent as seen in column (7), while a 10 unit increase in the difficulty of firing index will decrease FDI inflows by about 3-9 percent, as seen in columns (4) and (8).

The preceding results show that it is important to look not only at aggregate indexes, as important relationships may be concealed when analysis is based only on an aggregate index. For instance, the negative relationship found for the rigidity of employment index and FDI inflows to developing countries may give an impression that all types of labor market regulations should be reduced in developing countries in order to attract more FDI inflows. However, once the index is disaggregated into its components, only firing regulations have a negative impact on FDI inflows. In fact, regulations on work hours have a positive impact on FDI inflows up to a certain limit. Countries with rigidity of hours index below 40 can still increase their work hour regulations and still have an increase in their FDI inflows. However, countries with rigidity of hours index above 40 may find their FDI inflows decreasing if regulations on work hours are further increased. Of the 124 developing countries in the sample, 91 countries have rigidity of hours index below 40. My results imply that a great majority of developing countries can still increase their work hour regulations and still increase their FDI inflows.

Regulations on work hours may improve the productivity of workers, which may explain the positive impact of the rigidity of hours index on FDI inflows. This suggests that though regulations constrain work hours in developing countries, this is not necessarily seen by foreign investors as a hindrance to their operations. Making employees work beyond a certain number of hours may actually decrease their productivity. This likewise suggests that foreign investors do not necessarily gravitate towards countries where workers are made to

work for unreasonable number of hours.<sup>19</sup> Regulations on firing, however, may slow down the operations of firms, especially when an adjustment on the employment level needs to be made, which explains the negative relationship between the difficulty of firing index and FDI inflows. These results are consistent with the theoretical model presented in the previous section. On the one hand, labor market regulations decrease the marginal cost of production by increasing labor productivity, which increases FDI inflows. On the other hand, labor market regulations increase the adjustment costs faced by a firm when it decides to change its employment level, which deters FDI inflows.

Similar to the estimations using ILO indexes, results show that not all labor market regulations have the same and significant effects on FDI inflows to developed and developing countries. Based on the rigidity of employment index, labor market regulations have a larger negative impact on developed than developing countries. A 10 unit increase in the rigidity of employment index will reduce FDI inflows to developed countries by about 40 percent and only about 10 percent for developing countries. This is in contrast to the prediction of Haaland et al. (2003) that labor market flexibility should have a greater impact in developing than developed countries. A possible explanation for this is that worker compensation is in general more costly in developed than developing countries. Moreover, allowing for non-linear effects is important, as it may reveal additional information that is concealed when the relationship is just assumed to be linear. For instance, the positive impact of work hour regulations on FDI inflows to developing countries is only evident when a non-linear relationship is specified.

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<sup>19</sup> An example is the issue about a textile factory in India where laborers are made to work from dawn until late in the evening. This factory was exposed to produce garments for the American retail clothing chain GAP Inc. As a response, the latter severed all its ties with suppliers that are known to manufacture garments in deplorable working conditions.

The results in Tables 1A and 1B are very suggestive. While labor market standards generally increase FDI inflows, labor market regulations have a greater tendency of reducing FDI inflows. These imply that foreign investors prefer to invest in countries with some degree of labor market standards as these may signal higher aggregate labor productivity. However, foreign investors may be wary of some labor market regulations because these translate to actual costs. These suggest that developing countries need not “race to the bottom” in order to attract FDI inflows. What developing countries need to do is to find a proper balance of labor market standards and regulations such that these can increase labor productivity, but at the same time not becoming too rigid and costly from the point of view of MNCs.

Among the other explanatory variables, wage, GDP per capita, inflation rate, trade, tax, exchange rate, labor force participation rate, literacy rate, population, capital account openness, external debt, and corruption index appear significant in explaining FDI inflows, depending on the estimation technique used. Results are shown in Appendix Tables 7A and 7B.

Next, equations (7) and (7') are estimated for FDI inflows from Japan and US. Tables 2A and 2B display the results using ILO and WB indexes as labor market flexibility indicators, respectively. Table 2A, Panel A reveals that the decision of MNCs from both Japan and US to invest in other countries is affected by the potential host countries' labor market standards. It is noticeable though that Japanese MNCs are more sensitive to most labor market standards as revealed by the larger magnitude of effects on Japanese FDI inflows. In general, FDI inflows from Japan and US decrease as hiring and at work standards increase, but FDI inflows increase as firing standards increase.

Table 2A. Impact of Labor Market Standards on FDI Inflows from Japan and US

Labor Market Flexibility Indicator	Japan						US					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A. All Countries												
Hiring Standards	-0.0122** (0.005)			-0.0362** (0.014)			-0.0035** (0.001)			-0.0074** (0.003)		
(Hiring Standards) <sup>2</sup>				0.0005** (0.000)						0.0001* (0.000)		
At Work Standards		-0.0325** (0.006)			-0.1169** (0.017)			-0.0080** (0.001)			-0.0163** (0.003)	
(At Work Standards) <sup>2</sup>					0.0016** (0.000)						0.001** (0.000)	
Firing Standards			0.0079** (0.004)			-0.0037 (0.008)			0.0037** (0.000)			0.0113** (0.001)
(Firing Standards) <sup>2</sup>						0.0002* (0.000)						-0.0001** (0.000)
No. of Observations	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624
LR chi2	2196.10	2223.64	2194.82	2199.70	2257.80	2197.01	2723.77	2759.93	2736.79	2725.95	2767.45	2760.30
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.2802	0.2837	0.2800	0.2806	0.2881	0.2803	0.7144	0.7239	0.7178	0.7150	0.7259	0.7240
Panel B. Developed Countries												
Hiring Standards	-0.0039 (0.005)			0.0169 (0.016)			-0.0168** (0.001)			-0.0284** (0.003)		
(Hiring Standards) <sup>2</sup>				-0.0003 (0.000)						0.0002** (0.000)		
At Work Standards		-0.0217** (0.006)			-0.1010** (0.019)			-0.0097** (0.001)			-0.0383** (0.004)	
(At Work Standards) <sup>2</sup>					0.0012** (0.000)						0.0004** (0.000)	
Firing Standards			0.0172** (0.003)			0.0507** (0.012)			-0.0006 (0.000)			0.0120** (0.003)
(Firing Standards) <sup>2</sup>						-0.0003** (0.000)						-0.0001** (0.000)
No. of Observations	640	640	640	640	640	640	640	640	640	640	640	640
LR chi2	895.64	905.66	912.11	897.21	923.02	922.03	1242.33	1166.43	1126.01	1255.34	1213.92	1149.20
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.3072	0.3106	0.3128	0.3077	0.3166	0.3162	0.8665	0.8135	0.7853	0.8755	0.8466	0.8015
Panel C. Developing Countries												
Hiring Standards	-0.0246** (0.007)			-0.0400** (0.019)			-0.0022** (0.001)			-0.0013 (0.003)		
(Hiring Standards) <sup>2</sup>				0.0003 (0.0003)						-0.0001 (0.000)		
At Work Standards		-0.0539** (0.009)			-0.0640** (0.028)			-0.0039** (0.001)			0.0092** (0.003)	
(At Work Standards) <sup>2</sup>					0.0002 (0.000)						-0.0002** (0.000)	
Firing Standards			-0.0217** (0.008)			-0.0292 (0.023)			0.0012 (0.001)			0.0310** (0.004)
(Firing Standards) <sup>2</sup>						0.0001 (0.000)						-0.0008** (0.000)
No. of Observations	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984
LR chi2	1181.44	1213.70	1178.28	1182.09	1213.87	1178.43	1346.48	1351.81	1343.96	1346.59	1364.11	1387.18
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.2716	0.2790	0.2709	0.2717	0.2790	0.2709	0.7897	0.7929	0.7882	0.7898	0.8001	0.8136

Notes: Values in ( ) are standard errors. \*\* and \* indicate significance at 5% and 10% level, respectively.

Panel B reveals that hiring standards are insignificant for Japanese MNCs when they choose to invest in developed countries, but at work and firing standards are important for them. In particular, an increase in at work standards decreases FDI inflows from Japan, but an increase in firing standards increases FDI inflows from Japan. Meanwhile, US MNCs are sensitive to all labor market standards in developed countries. An increase in both hiring and at work standards decreases FDI inflows from US, but an increase in firing standards increases FDI inflows.

Panel C reveals that Japanese MNCs are sensitive to all labor market standards in developing countries. Japanese MNCs are most sensitive to at work standards in developing countries, such that a 10 unit increase in at work index will decrease FDI inflows by about 54-64 percent, as seen in columns (2) and (5). Firing standards, meanwhile, exert the least impact - a 10 unit increase in firing index will decrease FDI inflows by about 22 percent, as seen in column (3). Similarly, US MNCs are sensitive to all labor market standards in developing countries. A 10 unit increase in hiring index will decrease FDI inflows by only about 2 percent. A non-linear relationship, meanwhile, is found for both at work and firing standards. A 10 unit increase in at work and firing indexes will increase FDI inflows by about 9 and 31 percent, respectively. This positive effect, however, has a limit. Developing countries with at work and firing indexes beyond 23 and 20, respectively, may experience a decline in US FDI inflows if they further increase their at work and firing standards. Of the 124 developing countries considered, 89 countries have at work index below 23 and 108 countries have firing index below 20. This implies that most developing countries can further increase their at work and firing standards and still increase their FDI inflows from US.

Table 2B. Impact of Labor Market Regulations on FDI Inflows from Japan and US

Labor Market Flexibility Indicator	Japan								US								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Panel A. All Countries																	
Rigidity of Employment	-0.0185** (0.004)				-0.1307** (0.014)				-0.0062** (0.001)					-0.0618** (0.002)			
(Rigidity of Employment) <sup>2</sup>					0.0016** (0.0002)									0.0008** (0.000)			
Difficulty of Hiring		-0.0011 (0.003)				-0.0504** (0.000)				-0.0005 (0.000)					-0.0176** (0.001)		
(Difficulty of Hiring) <sup>2</sup>						0.0006** (0.000)									0.0002** (0.000)		
Rigidity of Hours			-0.0329** (0.003)				-0.0786** (0.008)				-0.0113** (0.000)					-0.0397** (0.002)	
(Rigidity of Hours) <sup>2</sup>							0.0006** (0.000)									0.0004** (0.000)	
Difficulty of Firing				0.0018 (0.003)				-0.0279** (0.010)				-0.0006** (0.000)				-0.0147** (0.002)	
(Difficulty of Firing) <sup>2</sup>								0.0004** (0.000)								0.0002** (0.000)	
No. of Observations	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624	2624
LR chi2	2205.65	2191.29	2270.16	2191.40	2258.82	2225.26	2293.08	2198.95	2751.59	2715.49	2909.36	2715.55	3062.29	2789.80	3115.12	2752.06	
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.2814	0.2796	0.2896	0.2796	0.2882	0.2839	0.2926	0.2806	0.7217	0.7123	0.7631	0.7123	0.8032	0.7317	0.8171	0.7218	
Panel B. Developed Countries																	
Rigidity of Employment	-0.0259** (0.005)				-0.0844** (0.022)				-0.0082** (0.001)					-0.0491** (0.005)			
(Rigidity of Employment) <sup>2</sup>					0.0009** (0.000)									0.0006** (0.000)			
Difficulty of Hiring		-0.0126** (0.004)				-0.0500** (0.017)				-0.0043** (0.000)					-0.0094** (0.003)		
(Difficulty of Hiring) <sup>2</sup>						0.0005** (0.000)									0.0001 (0.000)		
Rigidity of Hours			-0.0318** (0.004)				-0.0845** (0.011)				-0.0089** (0.001)					-0.0392** (0.002)	
(Rigidity of Hours) <sup>2</sup>							0.0007** (0.000)									0.0004** (0.000)	
Difficulty of Firing				-0.0023 (0.005)				-0.0243** (0.017)				-0.0021 (0.001)				-0.0208** (0.004)	
(Difficulty of Firing) <sup>2</sup>								0.0003 (0.000)								0.0002** (0.000)	
No. of Observations	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640
LR chi2	914.62	905.04	938.97	895.44	922.96	911.44	962.99	897.08	1161.11	1145.35	1190.45	1128.40	1240.34	1147.68	1357.07	1145.85	
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.3137	0.3104	0.3220	0.3071	0.3165	0.3126	0.3303	0.3077	0.8098	0.7988	0.8303	0.7870	0.8651	0.8004	0.9465	0.7992	
Panel C. Developing Countries																	
Rigidity of Employment	-0.0183** (0.006)				-0.1848** (0.022)				-0.0017 (0.001)					-0.0657** (0.004)			
(Rigidity of Employment) <sup>2</sup>					0.0022** (0.000)									0.0008** (0.000)			
Difficulty of Hiring		-0.0006 (0.004)				-0.0545** (0.011)				0.0017** (0.000)					-0.0118** (0.001)		
(Difficulty of Hiring) <sup>2</sup>						0.0006** (0.000)									0.0001** (0.000)		
Rigidity of Hours			-0.0424** (0.005)				-0.1035** (0.013)				-0.0097** (0.001)					-0.0380** (0.003)	
(Rigidity of Hours) <sup>2</sup>							0.0008** (0.000)									0.0004** (0.000)	
Difficulty of Firing				0.0064 (0.004)				0.0003 (0.0133)				-0.0004 (0.000)				-0.0066** (0.002)	
(Difficulty of Firing) <sup>2</sup>								0.0001 (0.000)								0.0001** (0.000)	
No. of Observations	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984
LR chi2	1177.50	1170.50	1233.13	1172.38	1227.14	1194.84	1249.57	1172.57	1345.35	1349.52	1408.16	1343.51	1581.52	1402.57	1484.85	1350.50	
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.2707	0.2691	0.2835	0.2695	0.2821	0.2747	0.2872	0.2695	0.7891	0.7915	0.8259	0.7880	0.9276	0.8226	0.8709	0.7921	

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively.

Similar to ILO indexes, Table 2B, Panel A reveals that WB indexes are significant determinants of FDI inflows from Japan and US, implying that investors from both countries

are sensitive to labor market regulations. In general, countries with higher labor market regulations receive fewer FDI from Japan and US. Results likewise reveal that Japanese MNCs are more sensitive to regulations than US MNCs, as implied by the larger magnitude of the coefficients of the indexes for the case of Japan. For both countries, it is evident there is a non-linear relationship between labor market regulations and FDI inflows, and that firing regulations exert the least impact among the labor market regulations considered.

Panels B and C similarly show that Japanese MNCs are in general more sensitive to labor market regulations than US MNCs, except for firing regulations in developing countries. Firing regulations are insignificant for Japanese FDI inflows to developing countries. However, a 10 unit increase in the firing index reduces US FDI inflows to developing countries by about 6 percent.

The foregoing suggests that investors from different countries have different preferences for different labor market standards and regulations. In general, Japanese MNCs are more sensitive to labor market standards and regulations than US MNCs. This finding is consistent with the conclusion of Lee (2003). MNCs from both countries are likewise more negatively affected by hiring and work hour regulations than firing regulations in both developed and developing countries. Firing standards and regulations have the least negative impact on FDI inflows. Firing standards even exert a positive impact on US FDI inflows to all countries.

Next, I consider the possibility that the impact of labor market flexibility on FDI inflows varies per sector. Tables 3A and 3B present estimations for manufacturing<sup>20</sup> and non-manufacturing<sup>21</sup> FDI inflows from Japan and United States.<sup>22</sup>

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<sup>20</sup> Manufacturing sector includes production of food, textile, lumber and pulp, chemical, metal, machinery, electrical, and transport.

Table 3A. Impact of Labor Market Standards on FDI Inflows from Japan and US, by Sector

Labor Market Flexibility Indicator	Japan						US					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A. Manufacturing FDI											
Hiring Standards	-0.0241** (0.010)			-0.0904** (0.024)			0.0153** (0.003)			0.0404** (0.009)		
(Hiring Standards) <sup>2</sup>				0.0016** (0.000)						-0.0004** (0.000)		
At Work Standards		-0.0029 (0.011)			0.0457 (0.028)			-0.0068 (0.004)			0.0012 (0.011)	
(At Work Standards) <sup>2</sup>					-0.0010* (0.000)						-0.0001 (0.000)	
Firing Standards			-0.0485** (0.009)			0.1175** (0.038)			0.0075** (0.003)			-0.0055 (0.006)
(Firing Standards) <sup>2</sup>						-0.0043** (0.001)						0.0001** (0.000)
No. of Observations	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290
LR chi2	1422.89	1417.21	1450.51	1431.37	1419.53	1480.50	2293.91	2284.04	2287.51	2299.98	2284.52	2291.97
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.4535	0.4516	0.4623	0.4562	0.4524	0.4719	0.4068	0.4051	0.4057	0.4079	0.4052	0.4065
	Panel B. Non-Manufacturing FDI											
Hiring Standards	-0.0407** (0.012)			-0.1108** (0.027)			-0.0042 (0.003)			0.0200** (0.008)		
(Hiring Standards) <sup>2</sup>				0.0016** (0.000)						-0.0004** (0.000)		
At Work Standards		-0.0269** (0.012)			-0.0098 (0.037)			-0.0028 (0.003)			0.0322** (0.009)	
(At Work Standards) <sup>2</sup>					-0.0001 (0.000)						-0.0006** (0.000)	
Firing Standards			-0.0890** (0.010)			0.0551 (0.041)			0.0077** (0.003)			0.0057 (0.006)
(Firing Standards) <sup>2</sup>						-0.0038** (0.001)						0.0001 (0.000)
No. of Observations	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291
LR chi2	1210.55	1203.22	1267.75	1217.12	1203.46	1282.33	2385.02	2384.40	2391.30	2391.96	2395.19	2391.43
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.3655	0.3643	0.3838	0.3685	0.3644	0.3883	0.4241	0.4240	0.4252	0.4253	0.4259	0.4252

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively.

Table 3A, Panel A reveals that Japanese FDI inflows to the manufacturing sector are very sensitive to both hiring and firing standards, but insensitive to at work standards. An increase in hiring standards decreases FDI inflows and an increase in firing standards increases FDI inflows as seen in columns (1), (4), and (6). Panel B shows that Japanese FDI inflows to the non-manufacturing sector, meanwhile, are very sensitive to all labor market

<sup>21</sup> Non-manufacturing sector includes farming and forestry, fishery, mining, construction, trade, finance and insurance, service, transportation, real estate, professional, scientific, and technical services, and information.

<sup>22</sup> A caveat to these estimations is that not all countries have reported breakdown of manufacturing and non-manufacturing FDI inflows. Countries with positive values of FDI inflows are therefore those countries which reported a breakdown, but this may not necessarily mean that those with zero FDI inflows did not actually have FDI inflows.

standards. In general, higher labor market standards decreases Japanese FDI inflows to the non-manufacturing sector. The results for US FDI inflows to the manufacturing and non-manufacturing sectors reveal quite a different picture. In contrast to Japanese FDI, US FDI inflows to both sectors are in general positively affected by labor market standards. The only exception is that at work standards are insignificant for US manufacturing FDI.

Table 3B. Impact of Labor Market Regulations on FDI Inflows from Japan and US, by Sector

Labor Market Flexibility Indicator	Japan								US							
	Panel A. Manufacturing FDI															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Rigidity of Employment	-0.0268** (0.011)				-0.0104 (0.038)				-0.0161** (0.004)				-0.0614** (0.015)			
(Rigidity of Employment) <sup>2</sup>					-0.0002 (0.000)								0.0006** (0.000)			
Difficulty of Hiring		-0.0092* (0.005)				-0.0360** (0.014)				-0.0002 (0.002)				-0.0125 (0.008)		
(Difficulty of Hiring) <sup>2</sup>						0.0003** (0.000)								0.0001 (0.000)		
Rigidity of Hours			-0.0171** (0.008)				-0.0718** (0.021)				-0.0138** (0.003)					-0.0717** (0.010)
(Rigidity of Hours) <sup>2</sup>							0.0008** (0.000)									0.0008** (0.000)
Difficulty of Firing					-0.0115* (0.006)			-0.1140** (0.015)				-0.0150** (0.002)				-0.0170* (0.008)
(Difficulty of Firing) <sup>2</sup>								0.0015** (0.000)								0.0001 (0.000)
No. of Observations	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290	2290
LR chi2	1425.66	1419.90	1423.61	1420.30	1425.96	1423.88	1431.45	1459.35	2298.06	2281.79	2299.16	2308.64	2309.10	2248.58	2345.64	2308.69
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.4544	0.4526	0.4537	0.4527	0.4545	0.4538	0.4562	0.4651	0.4076	0.4047	0.4078	0.4094	0.4095	0.4052	0.4160	0.4094
Labor Market Flexibility Indicator	Panel B. Non-Manufacturing FDI															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Rigidity of Employment	0.0165 (0.013)				-0.1924** (0.034)				0.0024 (0.004)				-0.0725** (0.012)		
(Rigidity of Employment) <sup>2</sup>					0.0031** (0.000)								0.0011** (0.000)			
Difficulty of Hiring		0.0080 (0.007)				-0.1007** (0.016)				0.0027 (0.002)				-0.0129* (0.007)		
(Difficulty of Hiring) <sup>2</sup>						0.0014** (0.000)								0.0001** (0.000)		
Rigidity of Hours			-0.0074 (0.010)				-0.1267** (0.021)				-0.0012 (0.003)					-0.0597** (0.008)
(Rigidity of Hours) <sup>2</sup>							0.0018** (0.000)									0.0008** (0.000)
Difficulty of Firing					0.0186** (0.008)			-0.0163** (0.017)				0.0012 (0.002)				-0.0201** (0.008)
(Difficulty of Firing) <sup>2</sup>								0.0026** (0.000)								0.0003** (0.000)
No. of Observations	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291	2291
LR chi2	1201.39	1200.44	1199.69	1205.84	1241.18	1244.29	1226.30	1296.50	2384.36	2385.34	2384.11	2384.14	2421.83	2390.84	2440.76	2391.24
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.3638	0.3635	0.3632	0.3651	0.3758	0.3767	0.3713	0.3926	0.4239	0.4241	0.4239	0.4239	0.4306	0.4251	0.4340	0.4252

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively.

Table 3B reveals that both manufacturing and non-manufacturing FDI inflows from both Japan and US are negatively affected by regulations. It is likewise noteworthy that a

non-linear relationship between labor market regulations and FDI inflows exist. The implications of these results for the case of US FDI inflows are very similar to what is suggested by the findings in Tables 1A and 1B. In particular, while US MNCs invest more in countries with higher labor standards, regulations have a greater tendency of reducing US FDI inflows. This implies that US foreign investors prefer to invest in countries with some degree of labor market standards as these may signal higher aggregate labor productivity, but they may be wary of some labor market regulations because these translate to actual costs.

Though results show that both manufacturing and non-manufacturing FDI inflows are sensitive to labor market standards and regulations, the impact of the latter on the former varies, depending on the standard or regulation considered. The difference in the impact of standards and regulations on US and Japanese FDI may be explained by the fact that FDI from the two countries go in different specific sectors and that different sectors have varying degrees of sensitivities to different labor market standards and regulations. The bulk of Japanese non-manufacturing FDI goes into service (professional, scientific, technical, information services) (31%), real estate (27%), and finance<sup>23</sup> and insurance (18%), while majority of US non-manufacturing FDI goes into finance<sup>24</sup> (45%), petroleum (16%), and wholesale trade (14%). Greater proportion of Japanese manufacturing FDI goes into electrical (38%), chemical (15%), and transport (11%), while majority of US manufacturing FDI goes into chemical (33%), machinery (17%), and transport (16%).<sup>25</sup>

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<sup>23</sup> Including banking institutions

<sup>24</sup> Excluding banking institutions

<sup>25</sup> These figures are based on average US and Japanese outbound FDI from 1990-2003.

## VI. Robustness Check

Several robustness checks were performed to verify the results in the preceding section. These estimations are displayed in Tables 4-6.

Table 4. Robustness Check – Coefficients of Wage and Wage<sup>2</sup> Excluding LMF Indicators

Panel A. Without LMF, FE			
	All Countries	Developed Countries	Developing Countries
Wage	0.0056 (0.048)	0.2478* (0.147)	-0.0196 (0.053)
(Wage) <sup>2</sup>	0.0029 (0.003)	-0.0121 (0.010)	0.0044 (0.003)
Panel B. Without LMF, OLS			
	All Countries	Developed Countries	Developing Countries
Wage	0.0624** (0.023)	0.1203* (0.066)	0.0644** (0.024)
(Wage) <sup>2</sup>	-0.0032* (0.001)	0.0042 (0.007)	-0.0040** (0.001)

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively. The same explanatory variables that appear in Appendix Table 7 are used in the estimations, but are not shown for brevity purposes.

First, though the correlation between wage and the different labor market flexibility indicators do not suggest a high level of correlation as seen in Appendix Table 8, I recognize the possibility that the labor market indicators may just be capturing the effect of wages or vice-versa. Table 4 contains the coefficients of wage and wage<sup>2</sup> in estimations excluding any labor market flexibility indicator. Coefficients in Panel A are estimated using fixed effects estimation, while coefficients in Panel B are estimated using ordinary least squares. These coefficients can then be compared to the coefficients of wage and wage<sup>2</sup> in Appendix Tables 7A and 7B, where labor market flexibility indicators are included in the estimations. The coefficients of wage and wage<sup>2</sup> displayed in Table 4, Panels A and B are similar to the

coefficients in Appendix Tables 7A and 7B, respectively.<sup>26</sup> This dismisses the possibility that the labor market flexibility indicators are capturing the effects of wages.

Table 5. Robustness Check – Including All LMF Indicators in a Single Estimation

Panel A. Labor Market Standards						
	All Countries		Developed Countries		Developing Countries	
	(1)	(2)	(3)	(4)	(5)	(6)
Hiring Standards	0.0008 (0.003)	0.0050 (0.005)	0.0042 (0.005)	0.0123 (0.008)	-0.0005 (0.003)	0.0015 (0.006)
(Hiring Standards) <sup>2</sup>		-0.0001 (0.000)		-0.0001 (0.000)		-0.0001 (0.000)
At Work Standards	0.0137** (0.003)	0.0056 (0.009)	0.0134** (0.006)	0.0113 (0.022)	0.0139** (0.004)	0.0055 (0.011)
(At Work Standards) <sup>2</sup>		0.0001 (0.000)		0.0001 (0.000)		0.0001 (0.000)
Firing Standards	0.0008 (0.001)	0.0013 (0.003)	-0.0002 (0.002)	-0.0045 (0.005)	0.0016 (0.002)	0.0121** (0.005)
(Firing Standards) <sup>2</sup>		0.0001 (0.000)		0.0001 (0.000)		-0.0002** (0.000)
No. of Observations	2640	2640	656	656	1984	1984
F-statistic	17.11	15.85	10.26	9.53	11.30	10.57
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.2067	0.2072	0.3965	0.3988	0.1873	0.1893

Panel B. Labor Market Regulations						
	All Countries		Developed Countries		Developing Countries	
	(1)	(2)	(3)	(4)	(5)	(6)
Difficulty of Hiring	0.0010 (0.000)	0.0009 (0.001)	0.0027* (0.001)	0.0046 (0.005)	-0.0013* (0.000)	-0.0035* (0.001)
(Difficulty of Hiring) <sup>2</sup>		0.0001 (0.000)		-0.0001 (0.000)		0.0001 (0.000)
Rigidity of Hours	0.0024** (0.000)	0.0031 (0.002)	-0.0020 (0.002)	-0.0466** (0.004)	0.0024** (0.001)	0.0155** (0.002)
(Rigidity of Hours) <sup>2</sup>		-0.0001 (0.000)		0.0005** (0.000)		-0.0001** (0.000)
Difficulty of Firing	-0.0033** (0.000)	-0.0062** (0.002)	-0.0040** (0.001)	0.0038 (0.006)	-0.0040** (0.000)	-0.0096** (0.002)
(Difficulty of Firing) <sup>2</sup>		0.0001 (0.000)		-0.0001 (0.000)		0.0001** (0.000)
No. of Observations	2640	2640	656	656	1984	1984
F-statistic	37.54	36.31	47.91	50.66	26.90	25.99
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.3205	0.3210	0.6448	0.6994	0.2721	0.2836

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively. The same explanatory variables that appear in Appendix Tables 7A and 7B are used in the estimations, but are not shown for brevity purposes.

Second, instead of adding the labor market indicators one by one, I included the indicators in a single estimation. Results are displayed in Table 5. Panel A adds the ILO indexes in a single estimation and Panel B adds the WB indexes in a single estimation. Comparing these with the coefficients of the ILO and WB indicators in Tables 1A and 1B,

<sup>26</sup> An exception is that the coefficient of wage becomes insignificant when at work indexes are included in the estimations for developed countries, as seen in Appendix Table 7A, Panel B, columns (2) and (5). In addition, the coefficient of wage becomes insignificant when WB indicators enter non-linearly in the estimations for developed countries, as seen in Appendix Table 7B, Panel B, columns (5)-(8).

where the indicators enter singly in the estimations, show that values and significance of most coefficients are similar.<sup>27</sup>

Table 6. Robustness Check – Impact of Labor Market Flexibility in Low and High Rigidity Countries

		Panel A. Labor Market Standards															
Labor Market Indicator	Flexibility	Low Rigidity								High Rigidity							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Hiring Standards		0.0144** (0.006)			0.0394 (0.075)					-0.0117 (0.004)				-0.0289* (0.016)			
(Hiring Standards) <sup>2</sup>					-0.0024 (0.007)									0.0002 (0.000)			
At Work Standards			0.0295** (0.009)			-0.0077 (0.021)						0.0065 (0.009)				-0.0730 (0.045)	
(At Work Standards) <sup>2</sup>						0.0024** (0.001)										0.0402 (0.061)	
Firing Standards				0.0001 (0.000)				-0.0011 (0.000)						-0.0032 (0.002)			-0.0178** (0.0064)
(Firing Standards) <sup>2</sup>								0.0001 (0.000)									0.0001** (0.000)
No. of Observations		1199	1554	1552	1199	1554	1552			1432	1077	1079	1432	1077	1079		
F-statistic		6.82	8.62	7.62	6.62	8.50	7.62			10.79	11.83	12.93	10.52	11.61	12.78		
Prob > F		0.000	0.000	0.000	0.000	0.000	0.000			0.000	0.000	0.000	0.000	0.000	0.000		
R-squared		0.1819	0.1721	0.1552	0.1820	0.1743	0.1552			0.2265	0.2932	0.3121	0.2272	0.2955	0.3161		
		Panel B. Labor Market Regulations															
Labor Market Indicator	Flexibility	Low Rigidity								High Rigidity							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Rigidity of Employment		0.0016 (0.002)				-0.0182** (0.008)				0.0066** (0.0022)				-0.1002** (0.021)			
(Rigidity of Employment) <sup>2</sup>						0.0005** (0.000)								0.0010** (0.000)			
Difficulty of Hiring			-0.0015 (0.002)					-0.0140** (0.007)				0.0014 (0.0011)					0.0110 (0.007)
(Difficulty of Hiring) <sup>2</sup>								0.0005* (0.000)									-0.0001 (0.000)
Rigidity of Hours				0.0129** (0.003)					0.0010 (0.000)				0.0005 (0.001)				-0.0293* (0.015)
(Rigidity of Hours) <sup>2</sup>									0.0006** (0.000)								0.0002* (0.000)
Difficulty of Firing					-0.0053** (0.001)					0.0463** (0.006)				0.0003 (0.002)			-0.0078 (0.019)
(Difficulty of Firing) <sup>2</sup>										-0.0017** (0.000)							0.0001 (0.000)
No. of Observations		1320	1197	878	1417	1320	1197	878	1417	1311	1434	1753	1214	1311	1434	1753	1214
F-statistic		21.13	19.99	32.46	27.65	21.65	19.95	32.46	28.66	19.30	20.80	23.31	18.17	19.96	20.47	22.85	17.68
Prob > F		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared		0.2719	0.3209	0.4230	0.3221	0.2744	0.3224	0.4230	0.3504	0.3940	0.3775	0.3286	0.3813	0.4039	0.3782	0.3303	0.3814

Notes: Values in ( ) are standards errors. \*\* and \* indicate significance at 5% and 10% level, respectively. The same explanatory variables that appear in Appendix Tables 7A and 7B are used in the estimations, but are not shown for brevity purposes.

Third, I divide the sample of countries into low and high rigidity countries. Countries with below average labor market indexes are considered to have less rigid labor markets,

<sup>27</sup> The only exception is that hiring standards loses significance in Table 5. This can be explained by the high correlation between hiring and at work standards as seen in Appendix Table 8.

while those with above average are considered to have more rigid labor markets. Results are shown in Table 6. Panel A, columns (1) and (2) reveal that countries classified under low rigidity will have increasing FDI inflows as hiring and at work standards increase. Firing standards are insignificant for low rigidity countries. Countries classified under high rigidity will have decreasing FDI inflows as hiring and firing standards increase, as seen in Panel A, columns (12) and (14). At work standards are insignificant for high rigidity countries. These suggest that countries with few labor market standards can still increase their standards and attract more FDI. However, for countries with already high labor market standards, increasing standards any further will deter FDI inflows. These confirm earlier results. Panel B shows that as hiring regulations increase in low rigidity countries, FDI inflows will decrease as seen in columns (6), but as work hour and firing regulations increase, FDI inflows will increase, as seen in columns (3) and (8), respectively. Meanwhile, as work hour regulations increase in high rigidity countries, FDI inflows will decrease as seen in column (15), but both hiring and firing regulations are insignificant as displayed in columns (10), (12), (14), and (16). Comparing these results to the developed and developing countries samples in Tables 1A and 1B shows no discernable pattern, suggesting that countries classified under low (high) rigidity countries are not necessarily developed (developing) countries.

Finally, I accounted for other market regulations that may be considered important by MNCs in choosing FDI host countries. In particular, I included variables that may capture the cost of market regulations, namely, the cost of starting a business, cost of registering a property, legal rights of a business, investor protection, and cost of implementing a contract.<sup>28</sup> Some of these variables are highly correlated with each other. For instance, investor

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<sup>28</sup> These are from the Doing Business Survey of the World Bank.

protection is highly correlated with legal rights of a business, and cost of a contract is highly correlated with the cost of starting a business. Thus, I did not include highly correlated variables in a single estimation. Some of these variables are likewise highly correlated with the labor market flexibility indexes. For instance, legal rights of a business is highly correlated with the rigidity of employment index<sup>29</sup>, and investor protection is highly correlated with the rigidity of hours and difficulty of firing index<sup>30</sup>. In such cases, I excluded the market regulation that is highly correlated with a labor market flexibility indicator. Results show that the other market regulations are not statistically significant in explaining differences in FDI inflows to countries coming from the rest of the world. A possible explanation for this is that the variables considered are highly correlated with the real GDP per capita, which is already included in the estimations.<sup>31</sup>

## VII. Conclusion

This study has made a number of significant contributions to our understanding of the labor market flexibility–FDI inflows literature. First, using a simple model, this study was able to reconcile the contrasting findings of previous studies. On the one hand, labor market regulations and standards decrease FDI inflows through the cost channel by increasing the total variable cost faced by a firm when it needs to make an adjustment in its employment level due to market uncertainties. On the other hand, labor market regulations and standards increase FDI inflows through the productivity channel by decreasing the marginal cost of production faced by a firm.

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<sup>29</sup> Countries with high degree of legal rights have low rigidity of employment index.

<sup>30</sup> Countries with high degree of investor protection have low rigidity of hours and difficulty of firing indexes.

<sup>31</sup> Average correlation coefficient between GDP per capita and various regulations is 0.50.

Second, in contrast to existing studies that have assumed a simple linear relationship, this study has shown that it is important to account for non-linear relationship between labor market flexibility and FDI inflows. Allowing for a non-linear relationship revealed that some degree of labor market standards and regulations may be attractive for foreign investors as this may signal better labor relations and higher labor productivity. There is evidence that the negative impact of some labor market standards and regulations may only manifest itself at higher levels of standards and regulations. This result is important especially for developing countries that want to attract more FDI inflows. In particular, there is no solid evidence that developing countries should “race to the bottom” in order to attract more FDI. What is needed is a proper balance of labor market regulations that will enhance labor productivity, but at the same time will not be too costly from the point of view of MNCs.

Third, in contrast to previous studies that have used a single aggregated index, this study used disaggregated labor market indicators to investigate the FDI-labor market flexibility relationship. Results strongly suggest that it is important to disaggregate the different aspects of labor market standards and regulations as foreign investors respond differently to them.

Fourth, the use of ILO indexes as indicators of labor market standards and WB indexes as indicators of labor market regulations has shown that it is important to distinguish between labor market standards and regulations. In general, FDI inflows increase in countries with higher labor market standards, but decrease in countries with higher labor market regulations. These suggest that countries should be cautious in formulating regulations to implement standards. While the existence of labor market standards may be attractive to foreign investors as they signal higher labor productivity, the way they are implemented is likewise important, as they can be costly from the point of view of firms.

Finally, this study has shown that Japanese and US MNCs respond differently to labor market standards and regulations. In particular, Japanese MNCs are more sensitive to most labor market standards and regulations, such that FDI inflows from Japan decrease as labor market standards and regulations increase.

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Appendix Table 1. ILO Conventions on  
Hiring, At Work, and Firing Standards

Standards	Convention No.
<i>Hiring</i>	
Minimum Age	138
Minimum Age (Industry)	59
Minimum Age (Non-Industrial Employment)	33
Minimum Age (Underground Work)	123
Part-Time Work	175
Minimum Wage Fixing	131
Minimum Wage Fixing (Agriculture)	99
Maintenance of Social Security Rights	157
Medical Care and Sickness Benefits	130
<i>At Work</i>	
Forty-Hour Week	47
Hours of Work (Commerce and Offices)	30
Hours of Work (Industry)	1
Weekly Rest (Commerce and Offices)	106
Weekly Rest (Industry)	14
Holidays with Pay	52,132
Holidays with Pay (Agriculture)	101
Paid Education Leave	140
Protection of Wages	95
Night Work	171
Night Work of Young Persons (Industry)	6, 90
Night Work of Young Persons (Non-Industrial Occupations)	79
Night Work (Women)	89
Employment Injury Benefits	121
Occupational Safety and Health	155
Occupational Health Services	161
Prevention of Major Industrial Accidents	174
Maternity Protection	103
Invalidity, Old-Age, and Survivors' Benefits	128
<i>Firing</i>	
Employment Promotion and Protection Against Unemployment	168
Protection of workers' Claims (Employer's Insolvency)	173
Termination of Employment	158
Unemployment Provision	44
Unemployment	2

Source: [www.ilo.org](http://www.ilo.org)

Appendix Table 2. World Bank Labor Market Flexibility Indicators

*Difficulty of Hiring Index (DHI)*

- whether term contracts can be used only for temporary tasks
- maximum duration of term contracts
- ratio of mandated minimum wage to the average value added per worker

*Rigidity of Hours Index (RHI)*

- whether night work is unrestricted
- whether weekend work is allowed
- whether the workweek can consist of 5.5 days
- whether the workday can extend to 12 hours or more (including overtime)
- the annual paid vacation days are 21 or fewer

*Difficulty of Firing Index (DFI)*

- whether redundancy is not considered fair grounds for dismissal
- whether the employer needs to notify the labor union or the labor ministry to fire 1 redundant worker
- whether the employer needs to notify the labor union or the labor ministry for group dismissals
- whether the employer needs approval from the labor union or the labor ministry for firing 1 redundant worker
- whether the employer needs approval from the labor union or the labor ministry for group dismissals
- whether the law mandates training or replacement before dismissal
- whether priority rules apply for dismissals
- whether priority rules apply for reemployment

Source: [www.doingbusiness.org/MethodologySurveys/EmployingWorkers.aspx](http://www.doingbusiness.org/MethodologySurveys/EmployingWorkers.aspx)

Appendix Table 3. Summary of Labor Market Indicators  
for Developed and Developing Countries

Countries	Developed Countries				Developing Countries			
With ILO Conventions	Hiring	At Work	Firing		Hiring	At Work	Firing	
Above the mean	69%	56%	71%		64%	40%	38%	
Below the mean	31%	44%	29%		36%	60%	62%	
With WB Indicators	REI	DHI	RHI	DFI	REI	DHI	RHI	DFI
Above the mean	46%	41%	68%	39%	51%	59%	33%	48%
Below the mean	54%	59%	32%	61%	49%	41%	64%	52%

Appendix Table 4. Labor Market Indicators in Developing Countries

Labor Market Indicator	Developing Country Dummy (=1)
ILO Indicators	
Hiring	-0.0475
At Work	-0.1692
Firing	-0.3990
WB Indicators	
Rigidity of Employment	0.1923
Difficulty of Hiring	0.1426
Rigidity of Hours	0.0303
Difficulty of Firing	0.1162

Appendix Table 5. Variable Description and Sources

Variable	Description	Source
FDI Inflows	Inflows of Foreign Direct Investment from the Rest of the World	www.unctad.org
Japanese FDI	Inflows of Foreign Direct Investment from Japan	http://www.mof.go.jp
US FDI	Inflows of Foreign Direct Investment from US	http://www.bea.gov/international
Wage	Monthly wage in US\$	www.ilo.org
GDP per capita	GDP per capita, PPP (constant 2000 international \$)	World Development Indicators
Inflation	Annual Inflation Rate	World Development Indicators
Trade	Trade in goods and services (% of GDP)	World Development Indicators
Tax	Taxes on goods and services (% of revenue)	World Development Indicators
Labor Force Participation	% of total population ages 15-64 in the labor force	World Development Indicators
Literacy Rate	Total adult literacy rate (% of people ages 15 and above)	www.unesco.org
Population	Population ages 15-64	World Development Indicators
Exchange Rate	Local Currency Unit per US\$, period average	World Development Indicators
External Debt	External debt (% of GDP)	World Development Indicators
Corruption Index	Index ranges from -2.5 to 2.5, with -2.5 and 2.5 indicating the least and most corrupt government	World Governance Indicators
Capital Openness Index	Index ranges from 0-1, with 0 and 1 indicating the most and least capital account restrictions, respectively,	Chinn and Ito (2006)
Manufacturing Value-Added	Manufacturing, value added (constant 2000 US\$)	World Development Indicators
Distance from US	Great circle distance between Washington DC, USA and Country's Capital (km)	http://www.indo.com/distance/
Distance from Japan	Great circle distance between Tokyo, Japan and Country's Capital (km)	http://www.indo.com/distance/
Dummy for Democratic Country	Dummy=1 if democratic country; 0, otherwise	World Factbook
Dummies for Preferential Trading Agreement	Dummy=1 if member of PTA; 0, otherwise (PTAs considered are AFTA, NAFTA, EU, MERCOSUR, CARICOM, COMESA)	www.wto.org

Appendix Table 6. Summary Statistics

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
FDI Inflows (% of GDP)	6.92	38.88	0	523.37
Japanese FDI, Total (in log)	1.53	2.51	0	10.55
Japanese FDI, Manufacturing (in log)	0.58	1.71	0	9.16
Japanese FDI, Non-Manufacturing	0.59	1.74	0	10.25
US FDI, Total (in log)	8.99	0.47	7.72	9.70
US FDI, Manufacturing (in log)	1.01	1.61	0	5.13
US FDI, Non-Manufacturing (in log)	0.97	1.55	0	4.59
Wage (in log)	5.93	1.83	0	14.79
Hiring Index	18.17	14.77	0	66.67
At Work Index	19.58	15.63	0	66.67
Firing Index	13.24	19.34	0	100
Rigidity of Employment	34.03	17.88	0	74
Difficulty of Hiring	31.88	26.55	0	100
Rigidity of Hours	39.15	22.28	0	80
Difficulty of Firing	31.09	21.80	0	80
GDP per capita	7933	8804	170.55	53582
Inflation	57.29	565.42	0	23773
Trade (% of GDP)	85.28	50.55	10.83	456.08
Taxes on Goods and Services (% of GDP)	29.28	12.79	0.69	79.45
Labor Force Participation Rate	69.73	8.91	46.07	93.12
Literacy Rate	78.36	22.05	11.40	100
Population (in log)	15.62	1.94	10.59	20.98
Exchange Rate (in log)	3.00	3.07	-19.84	14.22
External Debt (% of GDP)	1.40	18.03	0	548.15
Corruption Index	-0.01	1.00	-2.09	2.49
Manufacturing Value-Added	20.87	2.79	11.62	28.15
Distance from US (in log)	8.99	0.47	7.72	9.70
Distance from Japan (in log)	9.16	0.42	7.05	9.82

Appendix Table 7A. Impact of Other Explanatory Variables on FDI Inflows

	Panel A. All Countries						Panel B. Developed Countries						Panel C. Developing Countries					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Wage	0.0035 (0.048)	-0.0084 (0.048)	0.0013 (0.048)	0.0030 (0.048)	-0.0085 (0.048)	-0.0009 (0.048)	0.2904** (0.147)	0.1915 (0.146)	0.2441* (0.147)	0.3134** (0.148)	0.1921 (0.146)	0.2468* (0.148)	-0.0212 (0.053)	-0.0259 (0.053)	-0.0250 (0.053)	-0.0235 (0.053)	-0.0258 (0.053)	-0.0312 (0.053)
(Wage) <sup>2</sup>	0.0033 (0.003)	0.0041 (0.003)	0.0031 (0.003)	0.0034 (0.003)	0.0040 (0.003)	0.0032 (0.003)	-0.0139 (0.010)	-0.0085 (0.010)	-0.0120 (0.010)	-0.0153 (0.010)	-0.0085 (0.010)	-0.0121 (0.010)	0.0048 (0.003)	0.0054 (0.003)	0.0047 (0.003)	0.0049 (0.003)	0.0052 (0.003)	0.0053 (0.003)
GDP per capita	1.7031** (0.622)	1.6794** (0.620)	1.7954** (0.622)	1.7002** (0.623)	1.6886** (0.620)	1.7642** (0.623)	1.1021** (0.451)	1.3798** (0.437)	1.0797** (0.405)	1.0365** (0.451)	1.3459** (0.445)	0.2326** (0.425)	3.0341** (0.836)	2.9907** (0.833)	3.0849** (0.835)	3.0376** (0.836)	2.9905** (0.833)	2.9537** (0.837)
(GDP per capita) <sup>2</sup>	-0.1079** (0.039)	-0.1036** (0.039)	-0.1140** (0.039)	-0.1076** (0.039)	-0.1042** (0.039)	-0.1118** (0.039)	-0.0518 (0.216)	-0.0641 (0.216)	-0.0047 (0.219)	-0.0469 (0.216)	-0.0623 (0.216)	-0.0123 (0.222)	-0.1946** (0.053)	-0.1896** (0.053)	-0.1979** (0.053)	-0.1947** (0.053)	-0.1896** (0.053)	-0.1888** (0.053)
Inflation Rate	-0.0224 (0.014)	-0.0232* (0.013)	-0.0214 (0.014)	-0.0221 (0.014)	-0.0227* (0.013)	-0.0214 (0.014)	0.0335 (0.037)	0.0289 (0.037)	0.0336 (0.037)	0.0372 (0.037)	0.0290 (0.037)	0.0333 (-0.04)	-0.0352** (0.015)	-0.0357** (0.015)	-0.0347** (0.015)	-0.0351** (0.015)	-0.0347** (0.015)	-0.0336** (0.015)
Trade	0.4087** (0.061)	0.3924** (0.061)	0.4146** (0.061)	0.4062** (0.061)	0.3905** (0.061)	0.4144** (0.061)	0.3539** (0.157)	0.3903** (0.157)	0.3770** (0.159)	0.3652** (0.158)	0.3929** (0.158)	0.3714** (0.161)	0.3917** (0.069)	0.3705** (0.069)	0.03950** (0.069)	0.3877** (0.069)	0.3679** (0.069)	0.3867** (0.069)
Tax	-0.0707 (0.063)	-0.0704 (0.063)	-0.0629 (0.063)	-0.0720 (0.063)	-0.0670 (0.063)	-0.0619 (0.063)	-0.1001 (0.151)	-0.0980 (0.151)	-0.1435 (0.152)	-0.1127 (0.152)	-0.1006 (0.508)	-0.1470 (0.153)	-0.0372 (0.072)	-0.0419 (0.072)	-0.0285 (0.072)	-0.0387** (0.072)	-0.0387** (0.072)	-0.0257** (0.072)
LFP Rate	-0.4528 (0.394)	-0.2719 (0.395)	-0.4633 (0.396)	-0.4390 (0.394)	-0.3052 (0.399)	-0.4350 (0.397)	-0.7826 (0.805)	-0.5439 (0.812)	-0.4180* (0.782)	-0.8274 (0.807)	-0.5356 (0.814)	-1.4471 (0.792)	-0.2300 (0.475)	-0.1013 (0.474)	-0.1149 (0.481)	-0.1860 (0.477)	-0.1496 (0.480)	-0.0881 (0.480)
Literacy Rate	0.4010 (0.269)	0.2997 (0.269)	0.4205 (0.269)	0.3872 (0.269)	0.2999 (0.269)	0.4160 (0.123)	3.0753 (2.419)	3.0862 (2.371)	1.0009 (2.384)	2.4714 (2.494)	3.1132 (2.379)	0.7896 (2.539)	0.3431 (0.297)	0.2248 (0.298)	0.3359 (0.297)	0.3394 (0.297)	0.2239 (0.298)	0.3284 (0.297)
Population	-0.2371 (0.237)	-0.1336 (0.238)	-0.2521 (0.238)	-0.2452 (0.238)	-0.1241 (0.239)	-0.2464 (0.238)	0.1514 (0.421)	0.2775 (0.425)	0.0382 (0.424)	0.0805 (0.427)	0.2798 (0.425)	0.0603 (0.434)	-0.1236 (0.313)	-0.0556 (0.312)	-0.1451 (0.312)	-0.1260 (0.313)	-0.0424 (0.313)	-0.1343 (0.312)
Exchange Rate	0.0238** (0.010)	0.0224** (0.010)	0.0231** (0.010)	0.0240** (0.018)	0.0223** (0.010)	0.0233** (0.010)	0.1643* (0.095)	0.1051* (0.094)	0.1151* (0.098)	0.1567** (0.095)	0.1020 (0.096)	0.1188 (0.099)	0.0236** (0.010)	0.0226** (0.010)	0.0239** (0.010)	0.0239** (0.010)	0.0223** (0.010)	0.0256** (0.010)
KA Openness	0.0516** (0.016)	0.0526** (0.015)	0.0515** (0.016)	0.0510** (0.016)	0.0530** (0.016)	0.0516** (0.016)	0.0239 (0.031)	0.0198 (0.031)	0.0148 (0.031)	0.0236 (0.031)	0.0196 (0.031)	0.0149 (0.031)	0.0699** (0.019)	0.0713** (0.019)	0.0709** (0.019)	0.0689** (0.019)	0.0716** (0.019)	0.0761** (0.019)
External Debt	0.0081 (0.048)	0.0006 (0.048)	0.0095 (0.048)	0.0079 (0.048)	0.0006 (0.048)	0.0091 (0.048)	-0.0304 (0.044)	-0.0308 (0.044)	-0.0207 (0.044)	-0.0299 (0.044)	-0.0303 (0.044)	-0.0203 (0.044)	0.1552 (0.118)	0.1366 (0.118)	0.1522 (0.118)	0.1482 (0.118)	0.1340 (0.118)	0.1573 (0.118)
Corruption Index	0.0835** (0.017)	0.0828** (0.017)	0.0811** (0.017)	0.0825** (0.017)	0.0828** (0.017)	0.0812** (0.017)	0.0424 (0.123)	0.0895 (0.122)	0.0586 (0.124)	0.0075 (0.128)	0.0865 (0.124)	0.0570 (0.124)	0.0817** (0.018)	0.0810** (0.018)	0.0798** (0.018)	0.0808** (0.018)	0.0809** (0.018)	0.0797** (0.018)
Democracy	0.0027 (0.008)	0.0050 (0.008)	0.0028 (0.008)	0.0026 (0.008)	0.0052 (0.008)	0.0028 (0.008)	0.0125 (0.036)	0.0280 (0.036)	0.0064 (0.036)	0.0098 (0.036)	0.0278 (0.036)	0.0053 (0.036)	0.0036 (0.009)	0.0054 (0.009)	0.0040 (0.009)	0.0033 (0.009)	0.0056 (0.009)	0.0035 (0.009)

Notes: Columns in each panel correspond to columns in Table 1A. Values in ( ) represent standard errors. \*\* and \* indicate significance at 5% level and 10% level, respectively. Dummy variables for PTAs are included in the estimations, but were not reported to save space.

Appendix Table 7B. Impact of Other Explanatory Variables on FDI Inflows

	Panel A. All Countries								Panel B. Developed Countries								Panel C. Developing Countries							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wage	0.0634** (0.022)	0.0647** (0.023)	0.0648** (0.022)	0.0668** (0.022)	0.0554** (0.022)	0.0648** (0.023)	0.0644** (0.022)	0.0669** (0.022)	0.1249* (0.066)	0.1182* (0.068)	0.1288* (0.068)	0.1112* (0.066)	0.0456 (0.074)	0.1105 (0.070)	-0.0181 (0.072)	0.1176* (0.067)	0.0684** (0.024)	0.0678** (0.024)	0.0694** (0.024)	0.0753** (0.023)	0.0635** (0.024)	0.0679** (0.024)	0.0477* (0.024)	0.0779** (0.024)
(Wage) <sup>2</sup>	-0.0033* (0.001)	-0.0034* (0.001)	-0.0035** (0.001)	-0.0036** (0.001)	-0.0027 (0.001)	-0.0034* (0.001)	-0.0035** (0.001)	-0.0036** (0.001)	0.0039 (0.006)	0.0046 (0.007)	0.0040 (0.007)	0.0048 (0.006)	0.0096 (0.007)	0.0049 (0.007)	0.0147** (0.007)	0.0045 (0.006)	-0.0041** (0.001)	-0.0041** (0.001)	-0.0043** (0.001)	-0.0047** (0.001)	-0.0036** (0.001)	-0.0041** (0.001)	-0.0028 (0.001)	-0.0050** (0.001)
GDP per capita	2.0991** (0.381)	2.0909** (0.377)	2.1197** (0.381)	2.0835** (0.383)	2.0077** (0.383)	2.0920** (0.379)	2.1304** (0.374)	2.1091** (0.380)	2.4289** (0.351)	1.8900** (0.354)	3.1330** (0.356)	2.6194** (0.355)	3.1467** (0.341)	1.7610** (0.357)	2.9581** (0.327)	1.9304** (0.345)	0.8861** (0.446)	0.9680** (0.451)	0.9796** (0.450)	0.7957* (0.444)	0.8094* (0.449)	0.9640** (0.451)	1.1762** (0.450)	0.8910** (0.442)
(GDP per capita) <sup>2</sup>	-0.1256** (0.022)	-0.1253** (0.022)	-0.1268** (0.022)	-0.1242** (0.023)	-0.1201** (0.023)	-0.1254** (0.022)	-0.1274** (0.022)	-0.1257** (0.022)	-1.6983** (0.182)	-1.6697** (0.183)	-1.733** (0.185)	-1.7069** (0.184)	-1.7357** (0.176)	-1.6625** (0.185)	-1.5431** (0.167)	-1.6708** (0.178)	-0.0558** (0.028)	0.0608** (0.028)	-0.0614** (0.028)	-0.0499** (0.028)	-0.0512* (0.028)	-0.0605** (0.028)	-0.0725** (0.028)	-0.0556** (0.028)
Inflation Rate	-0.0211 (0.015)	-0.0214 (0.015)	-0.0263* (0.015)	-0.0199 (0.015)	-0.0218 (0.014)	-0.0214 (0.015)	-0.0256* (0.015)	-0.0197 (0.014)	-0.0618 (0.046)	-0.0619 (0.046)	-0.0594 (0.046)	-0.0705 (0.046)	-0.0902* (0.050)	-0.0640 (0.046)	-0.1185** (0.053)	-0.0512 (0.047)	-0.0421** (0.016)	-0.0448** (0.016)	-0.0470** (0.016)	-0.0434** (0.016)	-0.0421** (0.016)	-0.0447** (0.016)	-0.0379** (0.016)	-0.0415** (0.016)
Trade	0.7097** (0.042)	0.7098** (0.041)	0.7126** (0.042)	0.7132** (0.042)	0.6971** (0.041)	0.7103** (0.042)	0.7136** (0.041)	0.7099** (0.042)	0.7146** (0.067)	0.7352** (0.067)	0.7140** (0.065)	0.7058** (0.066)	0.7016** (0.069)	0.7378** (0.067)	0.6996** (0.067)	0.7336** (0.070)	0.5727** (0.048)	0.5704** (0.048)	0.5710** (0.048)	0.5855** (0.048)	0.5602** (0.048)	0.5686** (0.049)	0.5889** (0.049)	0.5913** (0.048)
Tax	0.0930** (0.025)	0.0904** (0.025)	0.0936** (0.025)	0.0982** (0.025)	0.1044** (0.025)	0.0904** (0.025)	0.0926** (0.026)	0.1004** (0.025)	-0.1960** (0.053)	-0.2001** (0.052)	-0.1780** (0.061)	-0.2081** (0.052)	-0.0558 (0.063)	-0.1949** (0.053)	-0.0294 (0.057)	-0.2144** (0.052)	0.1378** (0.027)	0.1393** (0.027)	0.1362** (0.027)	0.1404** (0.027)	0.1439** (0.027)	0.1391** (0.027)	0.1252** (0.027)	0.1462** (0.027)
LFP Rate	-0.2807* (0.172)	-0.2881* (0.172)	-0.3094* (0.174)	-0.3232* (0.171)	-0.3165* (0.173)	-0.2878* (0.172)	-0.3124* (0.172)	-0.3194* (0.171)	-3.1077** (0.485)	-3.012** (0.486)	-3.1900** (0.488)	-3.0697** (0.488)	-2.9035** (0.461)	-2.9579** (0.485)	-2.1963** (0.415)	-3.0827** (0.486)	0.4791** (0.157)	0.4635** (0.159)	0.4085** (0.162)	0.3804** (0.160)	0.4582** (0.158)	0.4640** (0.159)	0.3520** (0.158)	0.3801** (0.160)
Literacy Rate	0.2131** (0.061)	0.2258** (0.062)	0.2206** (0.061)	0.1926** (0.061)	0.2134** (0.061)	0.2245** (0.062)	0.2213** (0.061)	0.1914** (0.061)	0.7341 (1.084)	0.6941 (1.064)	0.4955 (1.092)	0.9754 (1.129)	0.6809 (1.036)	0.6965 (1.071)	0.7155 (0.975)	0.7859 (1.119)	0.2566** (0.064)	0.2674** (0.064)	0.2931** (0.063)	0.2536** (0.063)	0.2569** (0.064)	0.2702** (0.065)	0.2943** (0.062)	0.2444** (0.063)
Population	-0.0115 (0.010)	-0.0118 (0.010)	-0.0088 (0.010)	-0.0074 (0.010)	-0.0098 (0.010)	-0.0116 (0.010)	-0.0090 (0.010)	-0.0064 (0.010)	-0.1192** (0.026)	-0.1097** (0.026)	-0.1185** (0.026)	-0.1171** (0.027)	-0.0987** (0.0205)	-0.1115** (0.027)	-0.0978** (0.023)	-0.1190** (0.027)	0.0243** (0.011)	0.0225** (0.011)	0.0206* (0.011)	0.0298** (0.011)	0.0271** (0.011)	0.0223** (0.011)	0.0162 (0.011)	0.0323** (0.011)
Exchange Rate	0.0028 (0.006)	0.0031 (0.006)	0.0047 (0.006)	0.0005 (0.006)	0.0010 (0.006)	0.0032 (0.005)	0.0046 (0.006)	0.0010 (0.006)	0.0117 (0.018)	0.0089 (0.018)	0.0147 (0.018)	0.0136 (0.018)	0.0274 (0.020)	0.0060 (0.018)	0.0249 (0.017)	0.0103 (0.018)	0.0009 (0.006)	0.0025** (0.006)	0.0042 (0.006)	0.0011 (0.006)	0.0004 (0.006)	0.0023 (0.006)	0.0034 (0.006)	0.0015 (0.006)
KA Openness	0.0195 (0.012)	0.0198 (0.013)	0.0233* (0.013)	0.0162 (0.013)	0.0168 (0.013)	0.0198 (0.013)	0.0241* (0.013)	0.0149* (0.013)	0.0250 (0.028)	0.0279 (0.028)	0.0253 (0.028)	0.0251 (0.028)	0.0028 (0.030)	0.0278 (0.029)	0.0735 (0.029)	0.0365 (0.030)	0.0323** (0.014)	0.0352** (0.014)	0.0364** (0.014)	0.0314** (0.014)	0.0313** (0.014)	0.0352** (0.014)	0.0441** (0.014)	0.0302** (0.014)
External Debt	-0.0015** (0.000)	-0.0016** (0.000)	-0.0016** (0.000)	-0.0015** (0.000)	-0.0015** (0.000)	-0.0015** (0.000)	-0.0016** (0.000)	-0.0015** (0.000)	-0.0013** (0.000)	-0.0014** (0.000)	-0.0012** (0.000)	-0.0013** (0.000)	-0.0009** (0.000)	-0.0013** (0.000)	-0.0009** (0.000)	-0.0014** (0.000)	-0.0752** (0.028)	-0.0690** (0.027)	-0.0630** (0.027)	-0.0785** (0.027)	-0.0776** (0.027)	-0.0695** (0.027)	-0.0628** (0.027)	-0.0740** (0.027)
Corruption Index	0.0161* (0.008)	0.0151* (0.008)	0.0161* (0.008)	0.0167* (0.008)	0.0148* (0.008)	0.0151* (0.008)	0.0170** (0.008)	0.0160* (0.008)	0.1540** (0.074)	0.1517** (0.074)	0.1640** (0.075)	0.1431* (0.074)	0.17770** (0.074)	0.1540** (0.038)	0.2301** (0.076)	0.1307* (0.073)	0.0038 (0.008)	0.0044 (0.008)	0.0036 (0.008)	0.0037 (0.008)	0.0029 (0.008)	0.0045 (0.008)	0.0048 (0.008)	0.0029 (0.008)
Democracy	-0.0055 (0.005)	-0.0063 (0.005)	-0.0044 (0.005)	-0.0085 (0.005)	-0.0053 (0.005)	-0.0064 (0.005)	-0.0043 (0.005)	-0.0084 (0.005)	-0.0079 (0.024)	-0.0062 (0.024)	-0.0071 (0.024)	-0.0129 (0.025)	0.0123 (0.023)	0.0041 (0.023)	0.0073 (0.022)	0.0130 (0.025)	0.0049 (0.005)	0.0027 (0.005)	0.0032 (0.005)	0.0090 (0.005)	0.0047 (0.005)	0.0026 (0.005)	0.0035 (0.005)	0.0095 (0.005)

Notes: Columns in each panel correspond to columns in Table 1B. Values in ( ) represent standard errors. \*\* and \* indicate significance at 5% level and 10% level, respectively. Dummy variables for PTAs are included in the estimations, but were not reported to save space.

Appendix Table 8. Correlation of Labor Market Variables

All Countries								
	Wage	Hiring Standards	At Work Standards	Firing Standards	Rigidity of Employment	Difficulty of Hiring	Rigidity of Hours	Difficulty of Firing
Wage	1.0000							
Hiring Standards	0.0050	1.0000						
At Work Standards	0.1184	0.5974	1.0000					
Firing Standards	0.1788	0.3176	0.3176	1.0000				
Rigidity of Employment	-0.1750	0.2371	0.3539	0.1367	1.0000			
Difficulty of Hiring	-0.2143	0.1808	0.2574	0.1178	0.8075	1.0000		
Rigidity of Hours	-0.0004	0.2079	0.4067	0.1286	0.7577	0.4282	1.0000	
Difficulty of Firing	-0.0067	0.1517	0.1368	0.0618	0.7039	0.3327	0.3214	1.0000
Developed Country								
	Wage	Hiring Standards	At Work Standards	Firing Standards	Rigidity of Employment	Difficulty of Hiring	Rigidity of Hours	Difficulty of Firing
Wage	1.0000							
Hiring Standards	-0.1407	1.0000						
At Work Standards	-0.1503	0.7700	1.0000					
Firing Standards	0.0897	0.4037	0.3255	1.0000				
Rigidity of Employment	-0.2493	0.4663	0.6427	0.3515	1.0000			
Difficulty of Hiring	-0.1264	0.4337	0.5969	0.3811	0.8296	1.0000		
Rigidity of Hours	-0.2553	0.3874	0.6102	0.1314	0.8402	0.5064	1.0000	
Difficulty of Firing	-0.2236	0.3296	0.3473	0.3980	0.7980	0.5522	0.4981	1.0000
Developing Country								
	Wage	Hiring Standards	At Work Standards	Firing Standards	Rigidity of Employment	Difficulty of Hiring	Rigidity of Hours	Difficulty of Firing
Wage	1.0000							
Hiring Standards	0.0232	1.0000						
At Work Standards	0.1323	0.5140	1.0000					
Firing Standards	0.0136	0.2829	0.2339	1.0000				
Rigidity of Employment	-0.1067	0.1572	0.2709	0.1288	1.0000			
Difficulty of Hiring	-0.1642	0.1217	0.2049	0.1594	0.8023	1.0000		
Rigidity of Hours	0.0397	0.1182	0.2855	0.0858	0.7536	0.4463	1.0000	
Difficulty of Firing	-0.0850	0.1107	0.1133	0.0311	0.6702	0.2508	0.2934	1.0000

## LABOR MARKET RIGIDITY AND FOREIGN DIRECT INVESTMENT: THE CASE OF EUROPE

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**Abstract:** This paper examines the relationship between labor market rigidity and FDI decisions by European multi-national firms during 2004-2008. We use firm-level data for European Multinational Enterprises investment in 41 European countries during these four years. Using conditional fixed effect logit and Tobit estimations, we show that European MNEs generally respond to regulatory, gravity and firm specific indicators in the expected ways, but their responses to changes in labor market institutions are less consistent. We also find that the relationship between MNEs location decision and host country's labor market institutional factors is sensitive to host country's development stage and market integration with the EU countries.

**Keywords:** Foreign Direct Investment; Labor Flexibility; Economic Integration; Trade and Labor Market Interactions.

**JEL classification:** F23; J80; F15; F16.

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### 1. Introduction

The potential contribution of foreign direct investment (FDI)<sup>1</sup> to economic growth – with its introduction of new technology, capital accumulation, generation of jobs and access to new markets – has been extensively analyzed. Most studies have found that FDI exerts a positive effect on the growth rate of the receiving economy (i.e. Borensztein *et al.* (1998), De Mello (1999)), contributes in the generation of employment (Spiezia (2004), Vacaflores (2011)), and increases total tax revenues of the host country (Vacaflores (2009)). Consequently, many governments have developed policies to attract FDI. Many host countries have improved their macroeconomic environment and have also concentrated on upgrading specific policies, such as enhancing property rights, opening previously protected markets (especially government procurements), providing firm specific subsidies, and lowering tax rates to attract FDI.

The globalization of production processes by multinational enterprises (MNEs) has further encouraged policymakers around the world to redesign their labor market regulations to provide greater flexibility to the operations of MNEs. The rationale is that increased flexibility in labor market regulations will make a host country more attractive to MNEs looking at alternative locations and will result in greater FDI. Indeed, recent studies by Javorcik and Spatareanu (2005), Delbecque, Méjean, and Patureau (2007) and others have shown that labor market rigidities are negatively related to MNE's location decisions and the amount of FDI inflows.

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<sup>1</sup> FDI refers to ownership and control of productive assets, such as factories, mines or infrastructure, by a parent enterprise of a foreign affiliate.

However, while studies analyzing the impact of labor market institutions on FDI have provided evidence that greater labor market flexibility affects MNEs' location decisions and the amount of FDI, the impacts across time, regions, and levels of development have been relatively neglected. Changing conditions over time may make specific determinants more relevant in certain years than in others, perhaps bearing a differential effect according to the economic conditions of a given period. In addition, labor market flexibility could also have a differential effect on the location of FDI according to regions or types of countries if host country characteristics are inherently different. Investing in a European Union (EU) country may provide MNEs more certainty in regulatory enforcement and access to a broader market, as well as greater demand for its products. Transition economies, on the other hand, may be enticing as low-cost production platforms, but may also be detrimental for the lack of purchasing power of their populations, leading to different motivations for MNEs to invest in these countries than in the more established markets.

In this study we examine the effects of labor market rigidity on FDI using data on European firms' foreign investment within Europe over the period 2004-2008. We extend the framework utilized by Javorcik and Spatareanu (2005), where a set of host country characteristics and labor market indicators are used to estimate the location decisions of MNEs and amount of FDI, and to examine if the effects of the labor market indicators are stable across time and across different host country classifications. The data allow us to construct the decision variable in terms of a dichotomous variable to reflect FDI participation, and in terms of the stock of FDI in a given host country in four cross-sections to test the stability of the effects of labor regulations on FDI. Focusing on Europe also enables us to test the effects across different country classifications (i.e., EU versus non-EU and transition versus non-transition economies). This is important because FDI decisions are impacted by the characteristics of the host country according to the specific economic circumstances of the period and the perceived risks and rewards of the country or region.

We focus on the influence of three labor market indicators: the rigidity of hours' index, the firing costs, and the difficulty of hiring index. We find that the effect of the first two are in accordance with conventional wisdom when all countries are analyzed together, but when controlling for country classification we find evidence of a differential effect in some years. The evidence on the effect of the difficulty of hiring index is consistent in some years with previous studies only after accounting for inherent characteristics of the host country. We find that most of the so-called gravity determinants (e.g., size of market) of FDI are as expected and stable across time, with the exception of corporate tax rates.

The remainder of the article is organized as follows. Section 2 describes the literature on the impact of labor regulations on FDI. Section 3 lays out the data and the methodology. Section 4 presents the results, and Section 5 concludes.

## **2. Literature Review**

Globalization increasingly has wide-ranging impacts on almost every aspect of the production process and multinational corporations are adapting by expanding their

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operations across borders. Host countries actively compete to attract MNEs, enacting policies to facilitate trade, providing firm specific incentives, and increasing the flexibility of some regulations. One factor that may help countries differentiate themselves from alternative potential destinations is the degree to which their labor markets are regulated.

Research on this topic has been facilitated in recent years by the development of indices measuring various aspects of labor market regulation by Botero *et al.* (2004), the World Bank and World Economic Forum. The initial theoretical basis for the impact of labor market institutions on inward FDI is provided by Haaland and Wooton (2002). Their theoretical model focuses on uncertainty in the marketplace that forces firms to take into account the risk of having to close a foreign subsidiary. The model hypothesizes that, other things equal, a flexible labor market with limited lay-off rules and low closure costs will be more attractive to inward FDI. Haaland *et al.* (2003) extend the analysis to take into account not only exit costs, but also entry costs. They also show theoretically that worker protection rules will deter inward FDI. They find empirical support for their predictions in an analysis of FDI in Bulgaria, Romania and Poland by western MNEs during 1994-97.

Görg (2005) finds further empirical evidence in support of the Haaland and Wooton, and Haaland *et al.* hypotheses. Görg utilizes a labor market index of hiring and firing restrictions based on surveys of managers conducted by the World Economic Forum. Using aggregate data on U.S. FDI to 33 developed and developing countries during 1986-96, he finds a statistically significant negative relationship between U.S. FDI in manufacturing and labor market restrictions. Javorcik and Spatareanu (2005) also look at the impact of labor market rigidity on FDI utilizing firm-level data of new investments across 19 European countries during 1998-2001. The indices of labor market rigidity reflect laws governing individual and collective dismissals, length of the dismissal notice period, and the required severance payment. Their results suggest that greater flexibility in the host country's labor market relative to that in the investor's home country is associated with larger FDI inflows.

Dewit, Görg and Montagna (2009) further extend the theoretical model to not only include the impact of labor markets on inward FDI, but also on outward FDI (what they call “domestic anchorage”). They test the effects of employment protection differentials between domestic and foreign locations on the investment decision of MNEs in OECD countries during 1986-95. The index of employment protection for each country is based on measures of protection affecting the country's temporary and regular employment and they use bilateral FDI flows from the OECD's *International Investment Statistic Yearbook*. Their study finds that for a given level of home country employment protection, higher levels of employment protection in the host country discourage home country firms from investing there. In addition, they also find that a high level of employment protection in the home country discourages outward FDI.

In a study incorporating Krugman's international trade theory and labor market literature, Delbecque *et al.* (2007) analyze French firms' expansion decisions abroad during 1992-2001. Their empirical analysis utilized firm-level data to estimate the

impact of labor market institutions on the firms' location decisions. Their results suggest that stringent employment protection laws, powerful trade unions and a more centralized wage-bargaining process negatively impacted French firms' location decisions.

The most recent study, Olney (2011), is based on U.S. outward investment to 26 OECD countries during 1985-2003. It not only confirms the negative relationship between labor market rigidities (i.e., employment protection rules) and FDI, but also finds evidence that the effect differs by type of FDI. His results suggest that employment protection legislation in the host country has a limited impact when a firm invests in a country to access that foreign market (horizontal FDI). There is a more substantial negative impact when a MNE accesses a foreign market by setting up an affiliate in a neighboring country and exporting to the desired country (export-platform FDI), but the largest negative impact occurs when MNEs invest in a country in order to take advantage of low foreign factor prices and to minimize costs (vertical FDI).

There are, however, at least two studies that failed to consistently find the expected negative effects of labor market rigidity on the decision to invest in a given host country. In a study of FDI from seven developed countries entering seven Central and Eastern European countries using country-level data, Leibrecht and Scharler (2009) find that differences in employment protection legislation have no effect on FDI flows entering the host countries when labor costs are included in the model. However, they do find a statistically significant effect – although weak – when they drop labor costs, concluding that labor costs are already capturing information from the labor market, thus rendering the effect of labor rigidity on FDI into these transition economies insignificant when entered together. Parcon (2008) hypothesizes a non-linear relationship between labor market institutions and FDI inflow. Utilizing ILO labor market standards, as well as the World Bank's labor market regulatory indicators, Parcon analyses FDI inflows to 195 countries during 1990-2005 and finds evidence that FDI to developed and developing countries is affected differently (negatively in some cases and positively in other cases) by different aspects of labor market standards and regulations.

This study is similar to the above studies in analyzing the relationship between FDI and labor market institutions, and can be viewed as updating them in the sense that the time period covered herein is more recent. But, importantly, this study differs in several ways. Our analysis is based on a more extensive firm-level dataset than the previous studies utilizing firm-level data. Unlike all the previous studies, this study includes four cross-sections over time rather than a single cross section. The multiple cross-sections allow for changes in the labor market indices and, thus, allow us to analyze the stability of the parameters over time.

### 3. Data and Methodology

Our analysis examines the impact of labor market rigidity on MNEs location decisions and the amount of FDI in 40 European countries during 2005-08. To analyze the location decisions of the MNEs, we utilize a fixed effects logistic regression. For a given time period  $t$ , we specify this decision in the equation

$$FDI_{ij} = \alpha + \kappa * FDII_j + \phi * GI_j + \varphi * LMI_j + \varepsilon_{ij} \quad (1)$$

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where  $FDI_{ij} = 1$  if firm  $i$  conducts FDI in country  $j$ ,  $FDI_{ij} = 0$  otherwise. This decision is a function of FDI regulatory indicators in the host country ( $FDII_j$ ), gravity indicators of the host country ( $GI_j$ ), and labor market indicators of the host country ( $LMI_j$ ), all entering our specification with a lag. The parameter  $\alpha$  is the firm specific fixed effect, which controls for unobservable firm characteristics, and  $\varepsilon_{ij}$  is the error term. Each firm has the possibility to invest in 40 host countries in a given time period, so for each firm the number of observations is equal to the number of all possible destination countries under consideration.

The data on FDI and firm specific variables are derived from the OSIRIS database compiled by Bureau Van Dijk. Osiris provides company-level information on 65 million companies worldwide, including information on global ownership from which FDI is derived. We have extracted information on the investment decisions of all European firms with subsidiaries in other European countries. We first determine the MNE's ownership of a given subsidiary by multiplying the MNE's percentage ownership of the subsidiary by the total assets of the subsidiary. If an MNE owns more than one subsidiary in a country, those totals are added to determine the total stock of a MNE's FDI in each destination country.<sup>2</sup> For the analysis of MNE's location decisions, the information collected on FDI allows us to create a dichotomous measure that takes the value of one if the MNE of a given country invests in one of the other countries of Europe, and zero otherwise. The measure includes new and established subsidiaries. While previous studies have concentrated on the determinants of new FDI only, our examination of the stability of these effects over time forces us to include existing FDI to avoid survival bias.

The independent variables are entered in the models with a lag, not only to reflect the fact that investment decisions are taken in advance, but also to avoid potential reverse causality between FDI and the determinants. We include the so-called gravity variables of population, real GDP per capita, average wage, and geographic proximity incorporated in many of the earlier studies. The first measure is typically considered a proxy for the size of the market, and the second variable is a proxy for the purchasing power in the host country. Both measures are from the World Development Indicators (World Bank) and are particularly important if the FDI is geared to satisfying demand in the home market (horizontal FDI). The average wage, a measure of one aspect of the total cost of labor, is from Eurostat<sup>3</sup> expressed in real terms. Geographic proximity a dichotomous variable that indicates the home and host countries share a common border, a proxy for cultural affinity. Since FDI is influenced by the rules and regulation of the host country ( $FDII_j$ ), we include three measures of the regulatory environment in the host country, including corporate taxation, FDI rules

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<sup>2</sup> We then calculate total real FDI by dividing the stock of FDI by the CPI.

<sup>3</sup> In some cases the data were not available from Eurostat and, in those cases the data is from the country's Central Bank or statistical offices.

and property rights protection. The tax obligations in the host country are measured as the average statutory tax rate on profits of MNEs,<sup>4</sup> and are taken from Doing Business (World Bank). The security of MNEs' investment is measured by the Global Competitiveness Report's indices on property rights protection and rules governing FDI (indices range from 1 to 7). The indices increase as the security for MNE's investments improves.

Lastly, we include three indices of labor market institutions ( $LMI_j$ ) from the Doing Business publication: the rigidity of working hours, the difficulty of firing, and difficulty of hiring in the host country. The rigidity of hours index and the difficulty of hiring index are measures scaled from 0 to 100, with the indexes increasing if they become more rigid. The cost of firing an employee is measured in terms of weeks of compensation. These measures reflect labor market flexibility in the main dimensions in which the literature has focused, and are similar to the measures in Javorcik and Spatareanu (2005). We expect that an increase in the difficulty of hiring index, in the rigidity of hours index, or in the firing costs in a country would lead to a decrease in MNEs investing in that country.

In addition to examining the location decision of a MNE, we also explore the effects of the labor market indicators on the amount of investment that European MNEs made in other European countries during 2005-08. Using the Tobit model, we estimate the following equation for the volume of investment

$$\ln(FDI_{ij} + 1) = \alpha + \gamma * X_i + \beta * FDI_j + \delta * GI_j + \lambda * LMI_j + \varepsilon_{ij} \quad (2)$$

where the dependent variable is the logarithm of the size of real foreign direct investment made by firm  $i$  in country  $j$ . Following Javorcik and Spatareanu (2005), we take the log of one plus the volume of FDI because the volume of FDI equals zero in the potential destinations in which a given MNE does not operate.  $X_i$  denotes firm specific and home country specific variables. We include real total assets and international experience of a MNE as firm specific variables. Real total assets measures the size of a MNE, whereas the number of foreign subsidiaries of a MNE is used to proxy its international experience. The expectation is that the size of FDI should increase as a firm gets larger or acquires more international experience. We include home country GDP per-capita, and population to control for purchasing power and market size of the home country. It is expected that the volume of a MNE's FDI should increase as its home country gets richer since most MNEs are headquartered in the high-income countries. The other variables are the same as in the previous model. Both models use logs of real GDP per capita, population, wages, and total assets.

Panel A in Table 1 presents descriptive statistics of the variables included in our model for all European countries considered in our study. As can be observed, the rules on FDI and the protection of property rights became slightly more encouraging for MNEs between 2005 and 2008, and the level of taxes as a share of commercial profits decreased. We also see that average real wages increased in Europe by approximately 40% during this time period, real GDP per capita increased by

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<sup>4</sup> The statutory tax rate is not necessarily the effective tax rate that a MNE may pay.

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approximately 13%, but population remained relative stable. As far as labor market conditions are concerned, average firing cost seems to be fairly constant overtime, whereas, average values of difficulty of hiring workers and rigidity of hours indices show significant variation. Both of these measures indicate that labor markets on average became more rigid in 2006, and less rigid in following years. It should also be noted that there is significant variation in the labor market indicators across destination countries in a given time period (reflected in the standard deviation). Also, the variation in the firing costs and difficulty of hiring indices across countries is considerably greater than the variation in the rigidity of hours index.

	2005	2006	2007	2008
Rules on FDI (1 – 7)	4.913 (.607)	5.152 (.831)	5.241 (.791)	5.211 (.800)
Property Rights (1 – 7)	5.095 (1.177)	5.136 (1.062)	5.3 (1.106)	5.344 (1.020)
Tax Rate (0 – 100)	47.411 (12.834)	46.947 (12.803)	45.5 (12.229)	44.829 (12.149)
Average Real Wage (1000's USD)	29.346 (21.715)	32.098 (23.871)	34.546 (24.799)	41.346 (29.070)
Real GDP per capita (1000's USD)	17.760 (16.360)	18.237 (16.721)	18.868 (17.317)	19.761 (18.884)
Population (1000's)	20,869 (30,411)	20,924 (30,412)	20,983 (30,421)	21,058 (30,467)
Rigidity of Hours Index (0 – 100 )	57.575 (19.545)	60 (17.752)	56.363 (15.919)	52.941 (18.712)
Firing Costs (# of weeks)	28.125 (22.395)	28.125 (22.395)	28.181 (22.105)	28.454 (21.949)
Difficulty of Hiring Index (0 – 100 )	33.939 (25.603)	39.696 (21.648)	36.636 (21.529)	36.558 (23.860)
Note: standard deviations in parenthesis				

	2005		2006		2007		2008	
	T.E.	Non T.E.	T.E.	Non T.E.	T.E.	Non T.E.	T.E.	Non T.E.
Rigidity of Hours Index	55.384 (22.400)	59 (17.291)	60 (15.689)	60 (18.973)	60 (19.215)	54 (12.806)	61.538 (14.595)	47.619 (19.000)
Firing Costs	22.230 (11.543)	32.157 (26.711)	22.230 (11.543)	32.157 (26.711)	22.230 (11.543)	32.05 (26.108)	23.384 (11.035)	31.75 (26.233)
Difficulty of Hiring Index	32.384 (25.728)	34.95 (25.470)	38.384 (22.737)	40.55 (20.865)	36.615 (19.201)	36.65 (22.915)	37.538 (23.306)	35.952 (24.177)
Note: standard deviations in parenthesis								

	2005		2006		2007		2008	
	E.U.	Non E.U.	E.U.	Non E.U.	E.U.	Non E.U.	E.U.	Non E.U.
Rigidity of Hours Index	58.333 (20.749)	55.555 (15.713)	61.666 (19.075)	55.555 (12.570)	57.5 (17.618)	53.333 (9.428)	55.2 (20.614)	46.666 (9.428)
Firing Costs	27.434 (21.21)	29.888 (25.07)	27.434 (21.21)	29.888 (25.07)	27.916 (20.89)	28.888 (25.02)	28.291 (20.67)	28.888 (25.02)
Difficulty of Hiring Index	34.458 (25.83)	32.555 (24.92)	38.625 (22.90)	42.555 (17.56)	33.5 (21.51)	45 (19.21)	33.08 (24.11)	46.222 (20.20)

Note: standard deviations in parenthesis

To explore whether labor market conditions differ between (a) transition and non-transition economies within Europe, and (b) EU and non-EU countries, Panels B and C of Table 1 present labor market descriptive statistics for these categories.<sup>5</sup> A few differences are noteworthy. Firing costs are consistently higher in non-transition economies and in non-EU countries relative to their counter category. Variation in firing costs across non-transition economies is more than double the variation in firing costs in transition economies for each year studied. The rigidity of hours index and difficulty of hiring index also consistently differ between transition and non-transition economies, but this difference is not consistent across years. The same pattern holds for EU versus non-EU countries.

#### 4. Results

The results of the decision to invest abroad are presented in three parts: the first contemplating the importance of the measures of labor market flexibility of potential host countries on the decision to enter and remain in a host country, the second incorporating the importance of these labor conditions on the amount of FDI that MNEs made in the host countries, and the third explores the effect that labor market flexibility has on FDI according to country classification of the host country (transition versus non-transition economy) and the connectedness of the host country with the rest of the region (i.e., European Union membership).

Table 2, Panel A, presents the results of the conditional logit for the each of the years between 2005 and 2008. Because the interpretation of the coefficients of a logit regression is not straightforward, we report the odds ratio instead.<sup>6</sup> Of interest to us, the odd ratio  $\exp(\varphi)$  indicates whether changes in labor market rigidity increase or

<sup>5</sup> See Appendix Table A2 for list of countries in each category.

<sup>6</sup> The interpretation of this odds ratio is such that a one unit increase in the predictor would lead to an increase in the probability of investing abroad when the odds ratio is greater than one, compared to the default of not investing abroad. Alternatively, when the odds ratio is less than one, a one-unit increase in the predictor would lead to a decreased probability of investing abroad.

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decrease the probability of a multinational firm choosing to invest in a given foreign country,  $j$ , relative to abstaining from investing in that country.

	Panel A - Logit				Panel B - Tobit			
	2005	2006	2007	2008	2005	2006	2007	2008
Real Total Assets					0.454 *** (0.017)	0.560 *** (0.019)	0.632 *** (0.020)	0.266 *** (0.017)
Number of subsidiaries					1.883 *** (0.027)	1.808 *** (0.026)	1.919 *** (0.031)	3.517 *** (0.037)
Home GDP per capita					1.644 *** (0.098)	1.273 *** (0.095)	1.860 *** (0.087)	0.129 (0.088)
Home population					-0.165 *** (0.029)	-0.253 *** (0.031)	-0.262 *** (0.031)	-0.079 *** (0.028)
Host Rules on FDI	2.113 *** (0.095)	1.538 *** (0.060)	2.130 *** (0.101)	1.690 *** (0.063)	1.752 *** (0.093)	0.955 *** (0.091)	1.459 *** (0.100)	1.023 *** (0.080)
Host Prop. Rights	1.190 *** (0.052)	1.257 *** (0.069)	0.895 ** (0.047)	1.932 *** (0.095)	0.244 ** (0.103)	0.546 *** (0.134)	-0.047 (0.116)	1.008 *** (0.104)
Host Tax Rate	1.019 *** (0.002)	1.040 *** (0.002)	1.024 *** (0.002)	1.028 *** (0.002)	0.034 *** (0.004)	0.077 *** (0.005)	0.045 *** (0.004)	0.043 *** (0.004)
Host Wage	0.461 *** (0.050)	0.688 *** (0.079)	1.287 ** (0.155)	0.636 *** (0.072)	-1.384 *** (0.232)	-0.755 *** (0.279)	0.278 (0.251)	-0.916 *** (0.243)
Host GDP per capita	4.167 *** (0.544)	2.547 *** (0.302)	1.456 *** (0.173)	1.490 *** (0.160)	2.784 *** (0.288)	1.928 *** (0.283)	0.914 *** (0.253)	1.108 *** (0.235)
Host Population	2.036 *** (0.033)	1.827 *** (0.031)	1.965 *** (0.036)	1.883 *** (0.036)	1.560 *** (0.036)	1.411 *** (0.040)	1.477 *** (0.040)	1.271 *** (0.038)
Neighboring	2.745 *** (0.106)	3.356 *** (0.143)	3.121 *** (0.119)	2.940 *** (0.111)	2.579 *** (0.080)	2.996 *** (0.091)	2.593 *** (0.078)	1.870 *** (0.074)
Rigidity of Hours Index	0.991 *** (0.001)	0.980 *** (0.001)	0.997 ** (0.001)	0.997 ** (0.001)	-0.016 *** (0.003)	-0.041 *** (0.003)	-0.008 ** (0.003)	0.001 (0.003)
Firing Costs	0.993 *** (0.001)	1.001 (0.001)	0.993 *** (0.001)	0.988 *** (0.001)	-0.020 *** (0.002)	-0.002 (0.002)	-0.016 *** (0.002)	-0.022 *** (0.002)
Difficulty of Hiring Index	1.011 *** (0.001)	1.004 *** (0.001)	1.001 (0.001)	1.008 *** (0.001)	0.022 *** (0.001)	0.009 *** (0.002)	0.000 (0.002)	0.013 *** (0.002)
Observations	68536	63766	66927	74731	124746	121502	122748	116543
Pseudo R <sup>2</sup>	0.281	0.266	0.267	0.247	0.222	0.225	0.225	0.283

*Note: Odds ratios presented, with explanatory variables used with one lag. Statistical significance given by \*\*\* for 1% confidence level, \*\* for 5% confidence level, and \* for 10% confidence level. Standard Errors in parentheses.*

In terms of the regulatory variables that influence the decision to invest abroad by a MNE, the results indicate that host countries with rules that provide greater protection of FDI have a higher probability of attracting MNEs investment, and it is statistically significant at the one percent level. The results also show that an increase in the protection of property rights in the host country in 2005, 2006 and 2008 led to a higher probability that MNEs would invest in the host country, also statistically significant at the 1 percent level. In 2007, however, the effect of increased property rights protection resulted in a statistically significant lower probability of MNEs investing in a country. The estimate for the measure of the tax rate on profits indicates that an increase in the tax rate in the host country increases the probability of having MNEs entering or operating in their country, which is also statistically significant at the 1 percent level. While the first two regulatory variables largely have expected effect on FDI, the effect of corporate tax rates is counterintuitive.

The results of our second set of explanatory variables, the gravity measures that influence FDI decisions, show the expected impact on the decisions to invest abroad in all cases except one, and are statistically significant at the 1 percent level. Table 2, Panel A indicates that an increase in the average wage in the host country is associated with a statistically significant lower probability of MNEs investing in that country in three of the four years. This negative relationship is consistent with the MNE objective of internationally rationalizing the production process. In 2007, however, we find an unexpected result when a higher average wage rate in the host country led to a statistically significant higher probability of FDI. For the remaining gravity variables the results are as expected. An increase in the GDP per capita in the host country (a proxy for the wealth and purchasing power of its population) led to a higher probability that MNEs will enter and operate in the host country, indicating that foreign investment may be geared to satisfying local demand. In terms of the size of the market, we also find that host countries with larger populations are associated with a higher likelihood of having foreign companies investing in their countries, which reinforces the view that FDI in Europe seems to be somewhat oriented toward satisfying the local demand. These results suggest that the MNE's were engaged in both vertical FDI (i.e., seeking low-cost production platforms) and horizontal FDI (seeking markets in the wealthier countries with high income). The last indicator in this set reveals that host countries that share borders with the country where the MNE is headquartered had a statistically significant higher probability of attracting MNEs to their countries in each of the four years.

The results of the effects of labor market flexibility on potential host countries attracting FDI are consistent with expectations for two of the three variables. An increase in the rigidity of hours index represents less flexibility in the amount and scheduling of working hours. The results indicate a negative relationship, i.e., as host countries allow MNEs more flexibility the probability of attracting FDI increases, which is statistically significant at 5 percent or better. In terms of the influence of firing costs on the attraction of FDI, the results show that an increase in the number of weeks required to be paid in a severance package (an increase in firing costs) generally led to a lower probability of FDI in the host country, which is statistically significant at the 1 percent level. Both these measure behave as expected because more flexible work hours and smaller cessation costs allow MNEs to reshape labor inputs at lower costs in response to changing market conditions. Examining the effects of the difficulty in

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hiring workers on FDI, however, we find that a less flexible environment for hiring workers (an increase in the difficulty of hiring index) increased the probability that MNEs would enter and operate in the host country, which is counterintuitive to what one would expect. These findings are statistically significant at the one percent level for three of the four years.

We next turn to the empirical testing of the effects of the regulatory environment, gravity variables, and labor market flexibility on the amount of FDI during 2005-08. Table 2, Panel B presents the evidence on the amount of FDI undertaken by MNEs using the Tobit model in Equation 2 above. The effect of each variable on the amount of FDI is highly consistent with the finding regarding MNE's location decisions for FDI. The host country gravity variables, including GDP per capita, average wage rate, population and geographic proximity, all exhibit the expected signs and are statistically significant at the one percent level for each year.<sup>7</sup> Similarly, the regulatory variables rules on FDI and property rights have the expected signs and are statistically significant at the one percent level for almost all years.<sup>8</sup> The labor market flexibility variables, rigidity of hours index and firing cost indices, as expected, have statistically significant negative effects on the volume of FDI. In this model, we again find counterintuitive effects for corporate tax rate and difficulty of hiring that are statistically significant at the one percent level (except for difficulty of hiring in 2007). The Tobit specification provides some additional insights into the impact of investor characteristics (size and international experience of the MNE) on FDI. Not surprisingly, we find that the volume of FDI rises as the size of the MNE and its international experience grows (statistically significantly each year at the one percent level). The model also includes characteristics of the MNE's home country (GDP per capita and population). The expected positive relationships are supported and are statistically significant at the one percent level.

In summary, Table 2 provides evidence that host countries with regulatory environments more favorable toward investors, larger and wealthier domestic markets, lower labor cost, and more flexible labor markets have an advantage over other countries in attracting FDI. These results are consistent with previous findings (Javorcik and Spatareanu (2005), Delbecque *et al.* (2007), Olney (2011), Parcon (2008)). We do find two unexpected results – the effects of corporate profit tax and difficulty of hiring index. The results for the corporate profit tax rate may be explained by considering what is included and what is not taken into account in the total tax rate measure. The total tax rate measures the amount of taxes payable by a business after accounting for deductions and exemptions, expressed as a share of commercial profits, including profit or corporate income tax, social contributions and other labor taxes paid by the employer, property taxes, turnover taxes and other taxes, such as municipal fees and vehicle and fuel taxes (Doing Business, 2006, p. 71). It does not take into account preferential tax treatment that host countries often extend to MNEs on a case-by-case basis, or tax treatment and accounting allowed by home country regulations. Investment incentives, in the form of tax abatements, have increasingly become an important tool in the competition among countries to attract FDI. Such incentive,

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<sup>7</sup> With the exception that average wage rate for 2007 was not statistically significant.

<sup>8</sup> With the exception that property rights for 2007 was not statistically significant.

however, are not statutory and, thus, would not be reflected in the tax measure, but certainly may influence the location decisions of MNEs and the amount of FDI. There are also issues of double taxation in home and host country, and the potential for transfer pricing to shift profits and minimize taxation that can impact MNEs response to changes in corporate taxation (Blonigen (2005)). The unexpected results for the difficulty of hiring index are not easily explained, especially since the other two labor market flexibility measures were largely consistent with expectations across the years in both models. The difficulty of hiring index measures the applicability and duration of fixed-term contracts and the ratio of the country's minimum wage to the average value added per worker. While this measures a somewhat different aspect of labor markets flexibility than the rigidity of hours index and firing cost, it is not readily apparent why it would have an opposite effect on FDI.

While some studies (Delbecque *et al.* (2007), Görg (2005)) have utilized the levels of the gravity variables and labor market indicators as regressors, other studies have used the difference of the labor market indicator in the home country and that of the host country (Dewit *et al.* (2009), Javorcik and Spatareanu (2005)). We, thus, examine the relationships between MNEs' decision to invest and differences in corporate tax rates, average wage rate, and the labor market indicators in the home country and host country.<sup>9</sup> The results, in Table 3 below, indicate that all non-labor market variables, with the exception of differences in average corporate profit tax rates, have the expected signs and are statistically significant at 5% or higher. With respect to the relative labor market conditions, we find that host country rigidity of hours index and firing cost relative to the home country are generally significantly negatively related to FDI. We again, however, get counterintuitive results for the difficulty of hiring index. Thus, in general, the results are very similar to those presented in Table 2.

Since Panels B and C of Table 1 show significant differences in the labor market characteristics of different types of European economies, it is possible that grouping all the European countries together is somehow inexplicably influencing the results on the difficulty of hiring. To further investigate the relationships between labor market rigidities and FDI, we now introduce two alternative controls to try to unveil possible explanations for the unexpected results. We take into consideration that the investment decision of MNEs could be different according to the characteristics and the integration of the market in which they are investing. Since the breakup of the Soviet bloc, many European nations have been in various stages of restructuring their economic and political institutions. The same argument can be raised when the potential destination is a European Union (EU) country, since investing in an EU country involves access to the remaining countries of the EU, abiding by supranational rules and regulation, etc.

In order to examine the behavior of MNEs with regards to the restructuring of potential host countries, we create a dummy variable that takes the value of 1 when the destination country is a transition economy, and zero otherwise. Since our interest is in determining if labor flexibility can have a differential effect on FDI depending on the characteristics of the host countries we only interact our dummy variable with the labor

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<sup>9</sup> The difference in each variable is calculated as the level in the home country minus the level in the host country.

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market indicators. The results are presented below in Table 4 for both the logit (Panel A) and Tobit (Panel B) models. As the table shows, the transition dummy is statistically significant in all four cross sections, and indicates a preference towards higher investment in this set of countries starting in 2006, and becoming increasingly stronger through 2008.

	Panel A - Logit				Panel B - Tobit			
	2005	2006	2007	2008	2005	2006	2007	2008
Real Total Assets					0.425 *** (0.018)	0.555 *** (0.020)	0.639 *** (0.021)	0.263 *** (0.017)
Number of subsidiaries					1.956 *** (0.0281)	1.813 *** (0.0275)	1.954 *** (0.0319)	3.623 *** (0.0385)
Home GDP per capita					0.061 (0.206)	0.773 *** (0.227)	1.258 *** (0.193)	-0.638 *** (0.193)
Home population					-0.276 *** (0.034)	-0.042 (0.040)	-0.265 *** (0.039)	-0.236 *** (0.038)
Host Rules on FDI	2.218 *** (0.103)	1.590 *** (0.064)	2.177 *** (0.106)	1.751 *** (0.067)	1.508 *** (0.090)	0.865 *** (0.082)	1.261 *** (0.080)	0.934 *** (0.077)
Host Prop. Rights	1.181 *** (0.053)	1.247 *** (0.070)	0.907 * (0.049)	1.857 *** (0.093)	0.172 * (0.097)	0.540 *** (0.124)	0.086 (0.108)	0.514 *** (0.090)
Diff. Total Tax Rate	0.980 *** (0.002)	0.961 *** (0.002)	0.976 *** (0.002)	0.974 *** (0.002)	-0.010 ** (0.003)	-0.055 *** (0.004)	-0.023 *** (0.003)	-0.014 *** (0.003)
Diff. Average Wage	1.928 *** (0.212)	1.252 * (0.148)	0.692 *** (0.086)	1.420 *** (0.164)	1.687 *** (0.179)	0.912 *** (0.200)	0.651 *** (0.191)	0.436 ** (0.202)
Host C. GDP per capita	3.629 *** (0.484)	2.161 *** (0.263)	1.265 * (0.155)	1.381 *** (0.151)	3.241 *** (0.232)	2.103 *** (0.221)	1.772 *** (0.207)	1.192 *** (0.198)
Host Population	2.054 *** (0.034)	1.845 *** (0.032)	1.981 *** (0.037)	1.899 *** (0.037)	1.767 *** (0.037)	1.533 *** (0.038)	1.623 *** (0.037)	1.389 *** (0.034)
Neighboring	2.857 *** (0.112)	3.458 *** (0.149)	3.187 *** (0.123)	2.965 *** (0.113)	2.660 *** (0.081)	3.049 *** (0.092)	2.686 *** (0.079)	2.127 *** (0.075)
Diff. Rigidity of Hours Index	1.009 *** (0.001)	1.020 *** (0.001)	1.003 ** (0.001)	1.002 * (0.001)	0.026 *** (0.002)	0.045 *** (0.003)	0.013 *** (0.002)	-0.011 ** (0.002)
Diff. Firing Costs	1.007 *** (0.001)	0.999 (0.001)	1.007 *** (0.001)	1.011 *** (0.001)	0.014 *** (0.002)	-0.002 (0.002)	0.013 *** (0.001)	0.014 *** (0.001)
Diff. D.H. Index	0.988 *** (0.001)	0.995 *** (0.001)	0.998 * (0.001)	0.992 *** (0.001)	-0.020 ** (0.001)	-0.014 ** (0.001)	-0.006 ** (0.001)	-0.004 ** (0.001)
Observations	65720	60854	64015	72256	119722	116350	118236	113441
Pseudo R <sup>2</sup>	0.286	0.271	0.271	0.247	0.226	0.228	0.226	0.281

*Note: Odds ratios presented, with explanatory variables used with one lag. Statistical significance given by \*\*\* for 1% confidence level, \*\* for 5% confidence level, and \* for 10% confidence level. Standard Errors in parentheses.*

Table 4 – Determinants of FDI, Transition Economies								
	Panel A - Logit				Panel B - Tobit			
	2005	2006	2007	2008	2005	2006	2007	2008
Real Total Assets					0.460 *** (0.017)	0.563 *** (0.019)	0.638 *** (0.019)	0.269 *** (0.017)
Number of subsidiaries					1.878 *** (0.026)	1.810 *** (0.026)	1.908 *** (0.030)	3.506 *** (0.036)
Home GDP per capita					1.64 5*** (0.098)	1.269 *** (0.095)	1.873 *** (0.087)	0.115  (0.088)
Home population					-0.155 *** (0.029)	-0.253 *** (0.030)	-0.248 *** (0.030)	-0.076 *** (0.028)
Host Rules on FDI	2.552 *** (0.132)	1.672 *** (0.067)	1.630 *** (0.077)	1.985 *** (0.081)	2.031 *** (0.110)	1.114 *** (0.093)	0.992 *** (0.097)	1.224 *** (0.083)
Host Prop. Rights	1.091 * (0.050)	0.911 (0.054)	0.987 (0.058)	1.239 *** (0.064)	0.116  (0.103)	-0.107  (0.143)	0.016  (0.124)	0.347 ** (0.108)
Host Tax Rate	1.030 *** (0.002)	1.053 *** (0.002)	1.042 *** (0.002)	1.043 *** (0.002)	0.055 *** (0.004)	0.102 *** (0.005)	0.083 *** (0.004)	0.067 *** (0.004)
Host Wage	0.358 *** (0.059)	2.460 *** (0.411)	9.454 *** (1.550)	6.902 *** (1.091)	-1.508 *** (0.362)	1.812 *** (0.406)	4.135 *** (0.367)	2.976 *** (0.337)
Host C. GDP per capita	8.394 *** (1.328)	1.822 *** (0.251)	0.641 *** (0.089)	0.665 *** (0.089)	3.915 *** (0.348)	1.275 *** (0.328)	-0.582 * (0.306)	-0.348  (0.282)
Host Population	2.093 *** (0.044)	1.726 *** (0.038)	1.466 *** (0.031)	1.548 *** (0.033)	1.610 *** (0.043)	1.298 *** (0.049)	0.877 *** (0.042)	0.918 *** (0.040)
Neighboring	2.837 *** (0.112)	3.350 *** (0.144)	3.326 *** (0.132)	2.869 *** (0.111)	2.560 *** (0.081)	2.976 *** (0.090)	2.674 *** (0.079)	1.814 *** (0.074)
TE	0.292 *** (0.068)	2.329 *** (0.508)	7.831 *** (1.579)	87.150 *** 18.295 (0.521)	-1.766 *** (0.518)	1.777 *** (0.518)	3.348 *** (0.433)	7.552 *** (0.432)
Rigidity of Hours Index	0.969 *** (0.002)	0.972 *** (0.002)	0.967 *** (0.002)	0.995 *** (0.001)	-0.058 *** (0.004)	-0.055 *** (0.003)	-0.072 ** (0.004)	-0.004  (0.002)
RHI + RHI*TE	1.010 *** (0.002)	0.995 ** (0.002)	1.006 *** (0.002)	0.992 *** (0.002)	0.018 *** (0.004)	-0.011 *** (0.005)	0.017 *** (0.004)	-0.015 *** (0.005)
Firing Costs	1.001  (0.001)	1.013 *** (0.001)	1.011 *** (0.001)	1.005 *** (0.001)	-0.002 *** (0.003)	0.023 *** (0.003)	0.021 *** (0.002)	0.005 * (0.003)
FC + FC*TE	0.999  (0.005)	0.971 *** (0.004)	0.941 *** (0.004)	0.932 *** (0.004)	-0.008  (0.011)	-0.064 *** (0.009)	-0.122 *** (0.008)	-0.119 *** (0.009)
Difficulty of Hiring Index	1.020 *** (0.001)	1.005 *** (0.001)	1.013 *** (0.001)	1.011 *** (0.001)	0.039 *** (0.003)	0.009 *** (0.002)	0.026 *** (0.002)	0.018 *** (0.00.)
DHI + DHI*TE	1.016 *** (0.001)	1.012 *** (0.001)	1.000 (0.002)	0.997 * (0.001)	-0.032 *** (0.003)	0.027 *** (0.004)	0.004  (0.004)	-0.005 * (0.002)
Observations	68536	63766	66927	74731	124746	121502	122748	116543
Pseudo R <sup>2</sup>	0.293	0.273	0.288	0.261	0.226	0.227	0.232	0.287

Note: Odds ratios presented, with explanatory variables used with one lag. Statistical significance given by \*\*\* for 1% confidence level, \*\* for 5% confidence level, and \* for 10% confidence level. Standard Errors in parentheses.

The effects of the regulatory indicators on FDI are, in general, very similar to our baseline specification in both models, and also for the investor characteristics in the Tobit model. With respect to the host population and neighboring variables, the results are very similar to the findings for all the European countries. We find, however, that once we control for transition economies, the effects of wages on the location and amount of FDI become tilted towards investing in countries with higher wages – in three of the four years. Higher average wage rates indicate greater purchasing power for workers and may also be a reflection of higher labor productivity. Looking at the results of the effects of host country GDP per capita on FDI, we find the previously consistent positive effect is now negative for 2007 and 2008. Taken together these results suggest that MNEs were giving preference to investing in European countries with higher levels of labor productivity during 2006-08.

In terms of the labor market indicators, Table 4 shows that there are substantial differences between the effects of labor market flexibility on FDI in transitional versus non-transitional economies. For example, a more flexible environment in terms of determination of working hours in non-transition economies continues to be associated with a higher probability of investing in those host economies, and is statistically significant at the 1 percent level. In the case of a transition economy, the results indicate that this negative relationship holds only for 2006 and 2008. In 2005 and 2007, an increase in the rigidity of working hours in the transition economies increased the probability of investing in the country and increased the amount of FDI. We also find that increases in the cost of dismissing workers in non-transition economies results in a higher probability of MNE investment in these host countries for three of the four years. This effect is not in agreement with our previous results – nor with the expected outcome – but is statistically significant. The effect of higher firing costs in transition economies, however, reduces the probability of MNEs entering and investing in these countries, an effect that is statistically significant at the one percent level. Thus, the expected negative relationship between firing costs and FDI holds for transition economies, but not for non-transition economies.

The response of FDI to changes in the difficulty of hiring index also corroborates a differential effect of this labor market indicator on the decision to invest in a host country and on the amount of FDI entering these host countries. Our results consistently indicate an increase in the rigidity of hiring in non-transition economies increases the probability of MNEs investing in the non-transition countries (statistically significant at the 1 percent level). In the case of the transition economies, however, we find some statistically significant evidence of a negative relationship between the difficulty of hiring index and the probability of MNEs investing.

For the location decision, the logit model indicates a statistically significant positive relationship two years and a statistically significant negative relationship during 2008. In the Tobit model, the amount of investment in transition economies is significantly negatively related to the difficulty of hiring index during two years, and significantly positively related in only one year. Thus, we find statistically significant differences between the transition and non-transition economies and at least some evidence that the unexpected results on the difficulty of hiring index in our previous model may be driven by broader characteristics of the country rather than by the specific labor market institutions.

Table 5 – Determinants of FDI, European Union								
	Panel A - Logit				Panel B - Tobit			
	2005	2006	2007	2008	2005	2006	2007	2008
Real Total Assets					0.451 *** (0.017)	0.559 *** (0.019)	0.634 *** (0.020)	0.267 *** (0.017)
Number of subsidiaries					1.881 *** (0.027)	1.808 *** (0.026)	1.907 *** (0.031)	3.492 *** (0.037)
Home GDP per capita					1.660 *** (0.098)	1.255 *** (0.096)	1.862 *** (0.087)	0.141  (0.088)
Home population					-0.153 *** (0.029))	-0.258 *** (0.031)	-0.243 *** (0.030)	-0.067 *** (0.028)
Host Rules on FDI	0.825 *** (0.050)	1.179 *** (0.050)	1.079  (0.055)	1.461 *** (0.057)	-0.164  (0.126)	0.385 *** (0.095)	0.143  (0.106)	0.734 *** (0.075)
Host Prop. Rights	1.515 *** (0.066)	0.929  (0.053)	1.154 *** (0.062)	1.137 ** (0.062)	0.811 *** (0.095)	-0.099  (0.136)	0.401 *** (0.114)	0.063  (0.109)
Host Tax Rate	1.007 *** (0.002)	1.023 *** (0.002)	1.012 *** (0.002)	1.004 ** (0.002)	0.013 *** (0.004)	0.043 *** (0.005)	0.020 *** (0.004)	0.001  (0.004)
Host Wage	0.340 *** (0.042)	0.640 *** (0.079)	0.773 * (0.109)	0.870  (0.097)	-2.067 *** (0.262)	-0.775 ** (0.282)	-0.481  (0.289)	-0.112  (0.223)
Host C. GDP per capita	5.575*** (0.798)	3.461*** (0.447)	2.068*** (0.300)	1.590*** (0.175)	3.321*** (0.311)	2.420*** (0.301)	1.389*** (0.313)	0.968*** (0.230)
Host Population	2.290 *** (0.042)	1.995 *** (0.038)	2.024 *** (0.039)	2.160 *** (0.048)	1.786 *** (0.039)	1.555 *** (0.044)	1.480 *** (0.040)	1.467 *** (0.044)
Neighboring	2.874 *** (0.114)	3.666 *** (0.160)	3.774 *** (0.150)	3.618 *** (0.141)	2.629 *** (0.081)	3.106 *** (0.091)	2.830 *** (0.078)	2.119 *** (0.074)
EU	1.308  (0.272)	6.038 *** (2.197)	69.790 *** (30.465)	1.089  (0.391)	0.312  (0.429)	3.831 *** (0.830)	7.812 *** (0.983)	-0.055  (0.748)
Rigidity of Hours Index	0.958 *** (0.004)	0.984 ** (0.007)	1.010  (0.007)	0.955 *** (0.006)	-0.090 *** (0.009)	-0.032 * (0.016)	0.017  (0.015)	-0.081 *** (0.014)
RHI + RHI*EU	0.988 *** (0.001)	0.983 *** (0.001)	0.990 *** (0.001)	1.002 * (0.001)	-0.021 ** (0.003)	-0.034 *** (0.003)	-0.019 ** (0.003)	0.009 *** (0.003)
Firing Costs	0.985 *** (0.003)	0.985 *** (0.003)	0.962 *** (0.002)	0.956 *** (0.002)	-0.036 *** (0.006)	-0.040 *** (0.008)	-0.077 *** (0.005)	-0.076 *** (0.005)
FC + FC*EU	0.997 ** (0.001)	1.004 *** (0.001)	1.001  (0.001)	0.997 *** (0.001)	-0.009 *** (0.002)	0.008 *** (0.002)	-0.001  (0.002)	-0.008 *** (0.002)
Difficulty of Hiring Index	1.039 *** (0.003)	1.029 *** (0.004)	1.058 *** (0.003)	1.049 *** (0.003)	0.082 *** (0.006)	0.063 *** (0.009)	0.101 *** (0.007)	0.080 *** (0.005)
DHI + DHI*EU	1.001  (0.001)	0.999  (0.001)	0.994 *** (0.001)	1.001  (0.001)	0.000  (0.006)	-0.003  (0.002)	-0.013 ** (0.002)	0.000  (0.002)
Observations	68536	63766	66927	74731	124746	121502	122748	116543
Pseudo R <sup>2</sup>	0.302	0.285	0.306	0.280	0.229	0.231	0.237	0.294

Note: Odds ratios presented, with explanatory variables used with one lag. Statistical significance given by \*\*\* for 1% confidence level, \*\* for 5% confidence level, and \* for 10% confidence level. Standard Errors in parentheses.

We further explore this potential differential effect of labor market rigidities on FDI by incorporating an indicator on European Union membership. We create a dummy variable that takes the value of 1 when the destination country is a European Union (EU) member, and zero otherwise (see Appendix Table A2 for the list countries in each classification). The results are presented in Table 5 for both the logit (Panel A) and the Tobit (Panels B) models. It can be observed that the relationship between the regulatory, gravity and investor characteristic variables and FDI are similar to those presented in Table 2, so we concentrate here on the effects of the labor market indicators and their interactions with the dummy variable. Not surprisingly, the results indicate that the investment decisions of European MNEs have been biased towards investing in EU members, with all estimates of the dummy variable producing a positive influence of EU membership on the attraction of FDI, although the effect is statistically significant in only two years.

In terms of the impact of the rigidity of hours' index on the decision to invest in a given country, Table 5 shows that greater rigidity in working hours is generally associated with a lower probability to invest in non-EU economies (statistically significant in each year except 2007 in both models). In the case of foreign investment going to EU countries, we find a negative relationship in three years and a marginally positive effect only in 2008 in both models. With respect to the cost of dismissing workers, the results indicate that an increase in the cost of firing workers consistently led to a lower probability of MNEs investing in non-EU economies, an effect that is in accord with the conventional wisdom and statistically significant. Furthermore, for FDI going into EU countries we find the effect of firing costs on FDI remains negative and statistically significant for two of the four years, but positive and statistically significant in 2006 in both models.

The results on the effects of the difficulty of hiring index on FDI are also insightful. Table 5 shows that a more rigid environment in terms of hiring workers is associated with a higher probability of MNEs investing in non-EU countries, which remains counterintuitive and is still statistically significant. For the EU countries, we find a very different set of results. The only year for which there is a statistically significant result is 2007 and the relationship is negative. While this is consistent with expectations, it is the opposite of the relationship for non-EU countries and of the results in Table 2. Thus, it seems clear that the unexpected results on the difficulty of hiring index found earlier are being driven by the FDI going to non-transition or non-EU countries.

## 5. Summary and Conclusions

The decision to invest abroad by MNEs usually emanates from the desire to enter a foreign market when trade barriers are significant (horizontal FDI) or from the search for lower-cost production platforms (vertical FDI). This study of European FDI analyzes the effects of labor market institutions on FDI, controlling for regulatory frameworks that entice and protect foreign investment (rules on FDI, protection of property rights, and tax obligations), the gravity variables (wage rates, the GDP per capita, population, and proximity to the MNE headquarters), and the special characteristics of the MNE (size, international experience, and home characteristics).

The findings suggest that European MNEs generally respond to the regulatory, gravity and firm specific indicators in the expected ways, but their responses to labor market institutions are less consistent.

Our results indicate that labor market institutions play an important role in the determination of the location and amount European MNEs invest in other European countries, but the positive relationship between markets with greater labor market flexibility and foreign investment does not necessarily hold for all labor market indicators, time frames, and types of host countries. The rigidity of working hours indicator is the most consistent of the labor market indicators examined and is largely consistent with the expected relationship throughout the period studied for all the countries taken together. But, we also find when controlling for country classification, FDI in the transition economies is unexpectedly positively related to the rigidity of hours index in two of the four years studied. Also for the firing cost index, unexpected findings show up in the non-transitional economies for three of the four years and in the EU countries in one year.

The findings on the effects of the difficulty of hiring index on FDI are the most contrary to expectations and previous studies. When taking all the European countries together, increased rigidity in labor market hiring consistently increased the probability of MNEs investing in the host country. When we control for country classification, we find some differences begin to emerge. There is some evidence that in transition and EU economies, MNEs responded in the expected manner to hiring rigidities. Our interpretation is that MNEs may have different objectives when investing (e.g., vertical versus horizontal FDI) in different countries and thus do not always respond to changes in labor market institutions in the same way. While these findings differ somewhat from earlier studies on FDI, they are supported by at least one study indicating that not all labor market regulations have the same effect on FDI flows to developed and developing countries (Parcon (2008)). These findings also suggest that, contrary to what has been viewed by many as a policy consensus, increased labor market flexibility may not attract more FDI in all countries.

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**Appendix**

Table A.1 – Country Classifications

Country or Territory	Home country of Multinationals in sample	Transition Economy (0=No, 1=Yes)	European Union (0=No, 1=Yes)
Austria	Yes	0	1
Belgium	Yes	0	1
Bosnia and Herzegovina	Yes	0	0
Bulgaria	Yes	1	1
Croatia	Yes	1	0
Cyprus	No	0	1
Czech Republic	Yes	1	1
Denmark	Yes	0	1
Estonia	Yes	1	1
Finland	Yes	0	1
France	Yes	0	1
Germany	Yes	0	1
Gibraltar	No	0	0
Greece	Yes	0	1
Hungary	Yes	1	1
Iceland	Yes	0	0
Ireland	Yes	0	1
Italy	Yes	0	1
Latvia	Yes	1	1
Liechtenstein	Yes	0	0
Lithuania	Yes	1	1
Luxembourg	Yes	0	1
Macedonia (FYROM)	Yes	0	0
Malta	Yes	0	1
Republic Of Moldova	Yes	1	0
Monaco	Yes	0	0
Netherlands	Yes	0	1
Norway	Yes	0	0
Poland	Yes	1	1
Portugal	Yes	0	1
Romania	Yes	1	1
Russian Federation	Yes	1	0
Serbia	Yes	1	0
Slovakia	Yes	1	1
Slovenia	Yes	1	1
Spain	Yes	0	1
Sweden	Yes	0	1
Switzerland	Yes	0	0
Turkey	Yes	0	0
Ukraine	Yes	1	0
United Kingdom	Yes	0	1

## LABOR SUPPLY RESPONSE TO THE EARNED INCOME TAX CREDIT\*

NADA EISSA AND JEFFREY B. LIEBMAN

This paper examines the impact of the Tax Reform Act of 1986 (TRA86), which included an expansion of the earned income tax credit, on the labor force participation and hours of work of single women with children. We identify the impact of TRA86 by comparing the change in labor supply of single women with children to the change for single women without children. We find that between 1984–1986 and 1988–1990, single women with children increased their relative labor force participation by up to 2.8 percentage points. We observe no change in the relative hours worked by single women with children who were already in the labor force.

Historically, the United States has chosen to provide a safety net for families with children. Since 1935, Aid to Families with Dependent Children (AFDC) has supplied cash welfare payments to needy single-parent families. Families on AFDC may also receive food stamps, medicaid, and housing assistance. Because the maximum level of benefits is received by families with no income and because benefits are reduced almost dollar for dollar with additional earnings,<sup>1</sup> the welfare system is predicted by static labor supply theory to discourage the labor force participation and hours of work of single parents. Existing empirical evidence mostly confirms these theoretical predictions.<sup>2</sup>

In a series of major expansions beginning in 1987, the earned income tax credit (EITC) has emerged as a popular alternative method for transferring income to needy families with children. The EITC is a refundable credit; therefore, any credit due in excess of tax liability is refunded to the taxpayer in the form of a tax refund check. In 1996 when the most recent expansion of the EITC is scheduled to be fully phased in, the maximum credit will reach \$2206 for a taxpayer with one child and \$3644 for a tax-

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1. For discussions of effective marginal tax rates from the welfare and tax systems see Fraker, Moffitt, and Wolf [1985], Dickert, Houser, and Scholz [1994], and Giannarelli and Steuerle [1994].

2. Moffitt [1992] and Danziger, Haveman, and Plotnick [1981] survey the empirical literature.

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payer with two or more children. Advocates of the EITC argue that the credit transfers income to a particularly deserving group of people, the working poor, and that the redistribution occurs with much less distortion of labor supply than is caused by other elements of the welfare system. In particular, the credit is said to encourage labor force participation.

The EITC creates a complicated and ambiguous set of labor supply incentives. Standard labor supply theory does indeed predict that the EITC will encourage labor force participation. This occurs because the EITC is available only to taxpayers with earned income. But theory also predicts that the credit reduces the number of hours worked by most eligible taxpayers already in the labor force. While the credit initially increases with income, producing offsetting income and substitution effects on hours worked, over 70 percent of recipients have incomes in regions in which the credit is constant (and therefore produces only a negative income effect on labor supply) or is being phased out (producing negative income and substitution effects). Moreover, since the phaseout of the credit produces a nonconvexity in the budget constraint, taxpayers with incomes beyond the phaseout region may choose to reduce their hours of work and take advantage of the credit. Cumulative marginal tax rates can be quite high in the phaseout region. In 1996 some taxpayers with two children and income between \$11,610 to \$28,495 will face a net marginal tax rate (on the worker's marginal revenue product) of 53 percent.<sup>3</sup>

In this paper we examine the impact of the Tax Reform Act of 1986 (TRA86), which included an expansion of the EITC, on labor force participation and hours of work. The expansion of the credit affects an easily identifiable group, single women with children, but is predicted to have no effect on another group, single women without children. Other features of TRA86, such as the increase in the value of dependent exemptions and the large increase in the standard deduction for head of household filers, are predicted by economic theory to have reinforced the impact of the

3. We assume that the full incidence of payroll taxes falls on the worker. The net marginal tax rate is the share of the worker's marginal revenue product that is paid in taxes and lost benefits. A worker whose gross pay is \$10 an hour would have a marginal revenue product of \$10.765, since the employer pays half of the OASDHI payroll tax. After subtracting \$1.50 for federal income tax, \$.60 for state income tax, \$.765 for the employee's share of OASDHI, and \$2.106 in lost EITC payments, the taxpayer has a net of tax and benefits hourly wage of \$5.029. Dividing the total tax and lost benefits \$5.736 by \$10.765 yields a marginal tax rate of 53.3 percent. If some of employee compensation is in untaxed benefits, then this is an overstatement of marginal tax rates.

EITC on the *relative* labor supply outcomes of single women with and without children. We therefore compare the change in labor supply of single women with children to the change in labor supply of single women without children. We find that after TRA86, the labor force participation of single women with children increased by up to 2.8 percentage points relative to single women without children (from a base of 73.0 percent). We explore a number of alternative explanations for this finding, and conclude that the expansion of the EITC and the other provisions of TRA86 are the most likely explanation. We find no effect of the EITC expansion on the hours of work of single women with children who were already in the labor force.<sup>4</sup>

The remainder of the paper is divided into six sections. Section I explains the eligibility rules and structure of the EITC and outlines the predicted impact of the EITC on participation and hours of work. Section II discusses our identification strategy and our various treatment and control groups. Section III describes the data. Section IV presents empirical results for labor force participation. Section V presents estimates for hours and total employment. Section VI concludes.

### I. THE STRUCTURE OF THE EITC

The earned income tax credit began in 1975 as a modest program aimed at offsetting the social security payroll tax for low-income families with children. After major expansions in the tax acts of 1986, 1990, and 1993, the EITC has become a central part of the federal government's antipoverty strategy. By 1996 federal spending on the EITC (including both tax expenditures and outlays) is projected to be 1.7 times as large as federal spending on AFDC.

A taxpayer currently needs to meet three requirements in order to be eligible for the earned income tax credit. First, the

4. A number of other papers have analyzed labor supply response to the EITC. We believe, however, that our paper is the first that estimates actual behavioral responses to a change in the credit. Three papers have used estimates from the negative income tax experiments to predict the impact of the EITC on labor supply [Hoffman and Seidman 1990; GAO 1993; Holtzblatt, McCubbin, and Gillette 1994]. In addition, Dickert, Houser, and Scholz [1995] estimate a joint labor market and welfare participation model that incorporates the EITC. Using their results and hours of work elasticities from the labor supply literature, they simulate the effects on labor supply of the recent expansion of the EITC. Finally, Triest [1993] and Browning [1995] present opposing views on whether the EITC is an efficient method of transferring income to low-income families.

taxpayer must have positive earned income. Earned income is the sum of wage and salary income, business self-employment income, and farm self-employment income. Second, a taxpayer's adjusted gross income and earned income must both be below a specified amount (In 1996 the maximum income for a taxpayer with two or more children to be eligible to receive the EITC is \$28,495). Third, a taxpayer must have a qualifying child.<sup>5</sup> A qualifying child is a child, grandchild, stepchild, or foster child of the taxpayer who is under the age of 19 (under 24 if a full-time student) or permanently disabled, and who lives with the taxpayer for more than one-half of the tax year. Until 1991 the rules for EITC eligibility were more complicated and depended on the taxpayer's filing status.<sup>6</sup> The credit is refundable so that a taxpayer with no federal tax liability, for example, would receive a tax refund from the government for the full amount of the credit. Taxpayers may also receive the credit throughout the year with their paychecks; but in 1992, the most recent year for which data are available, less than one-half of 1 percent of all EITC recipients availed themselves of this early payment option [Internal Revenue Service 1992].

The amount of the credit to which a taxpayer is entitled depends on the taxpayer's earned income, adjusted gross income, and, since 1991, the number of EITC-eligible children in the household. In 1996 the credit for a family with two or more children is phased in at a 40 percent rate over the first \$8890 of earned income, resulting in a maximum credit of \$3556. As income rises from \$8890 to \$11,610, the credit remains at \$3556. Then the credit is phased out at a 21.06 percent rate on income starting from \$11,610 (the maximum of AGI and earned income governs the phaseout), so that by \$28,495 the taxpayer is no longer eligible for the credit.

Figure I shows how the introduction of an EITC shifts the

5. Beginning in 1994, a small credit is available to low-income workers without children.

6. Before 1991 a taxpayer could claim the EITC only if he or she used a filing status of married filing jointly, head of household, or surviving spouse. A married taxpayer could claim the EITC only if he or she claimed a dependent child on his or her tax return, and the child lived with the taxpayer for more than six months during the year. An unmarried taxpayer filing as head of household did not have to claim the child as a dependent in order to be eligible for the EITC, but, in order to file as head of household, the taxpayer must have paid more than half the cost of keeping up the home. Therefore, both married filers (through the rules for claiming a dependent) and head of household filers were required to meet a support test. AFDC payments are not considered support provided by the taxpayer. Consequently, a taxpayer with \$6000 in AFDC income and \$5000 in earned income was not eligible for the EITC under pre-1991 rules.

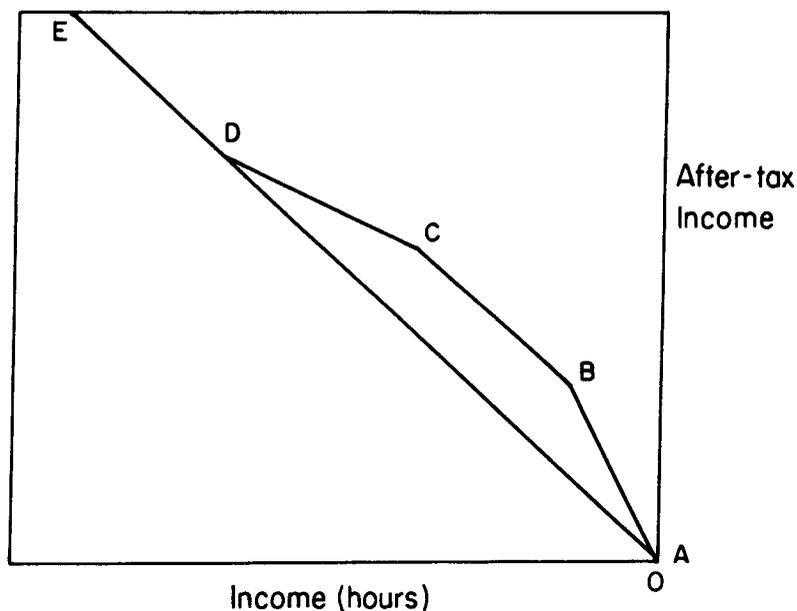


FIGURE I  
EITC Budget Constraint

budget constraint of an otherwise untaxed individual from *ADE* to *ABCDE*. Under the new budget constraint every choice of hours (or equivalently pretax earnings) produces at least as much after-tax earnings (and utility) as it did before the earned income tax credit was introduced. The well-being of a taxpayer who does not work has not changed because no earned income tax credit is available to a taxpayer with zero earnings. Thus, any taxpayer who preferred working before will still prefer working, and some taxpayers may find that the additional after-tax income from the EITC makes it worth entering the labor force. The impact of the EITC on the labor force participation of unmarried taxpayers is therefore unambiguously positive.

The impact of introducing an EITC on the hours of work of a taxpayer already participating depends on which region of the EITC the taxpayer was in before the credit was introduced. For a worker in the phase-in, the effect on labor supply is theoretically ambiguous: the credit subsidizes the worker's wage so that the substitution effect encourages additional hours while the income effect causes hours to decrease. For a worker in the constant region, there is only an income effect, reducing hours. In the phase-

out region the EITC unambiguously reduces labor supply since there is both a negative substitution effect from the credit being phased out and a negative income effect from the additional income the credit provides to the taxpayer. Beyond the credit region, taxpayers may decide to reduce their hours of work and receive the credit.

## II. IDENTIFICATION STRATEGY

We study the labor supply response of single women with children to the 1987 expansion of the earned income tax credit, which occurred as part of the Tax Reform Act of 1986. We focus on single women with children because they are the largest group of taxpayers eligible for the EITC, making up approximately 48 percent of the EITC eligible population in the March 1992 CPS [Eissa and Liebman 1993]. In addition, they are the group most relevant for studying whether the EITC reduces welfare dependency. Finally, they are the group for which we can most plausibly ignore the joint labor supply decisions of other family members, and thus derive simple predictions from labor supply theory.<sup>7</sup> We study the 1987 expansion of the credit because it was the largest EITC expansion that was not phased in over a number of years. The incentives created by the 1987 expansion of the EITC were reinforced by other tax changes implemented after the Tax Reform Act of 1986, making the relative impact on single women with children similar in size to the larger EITC expansions of the 1990s.

The 1987 expansion of the EITC increased the subsidy rate for the phase-in of the credit from 11 percent to 14 percent and increased the maximum income to which the subsidy rate was applied from \$5000 to \$6080. This resulted in an increase in the maximum credit from \$550 to \$851 (\$788 in 1986 dollars). The phaseout rate was reduced from 12.22 percent to 10 percent.

7. In a two-parent family the credit may reduce the probability of participation for the secondary earner through an income effect. The overall effect on family labor supply will depend critically on the model of labor supply assumed to hold at the household level and on the distribution of earnings within the family. In 47 percent of married couples earning less than \$25,000, the woman accounts for at least 40 percent of the family's earnings (March 1993 CPS). Therefore, the common assumption that a family's marginal tax rate is determined by the male's earnings may not be appropriate for this population. Even for household heads, the simple model may not be sufficient. Edin and Jencks [1993] show that most single mothers receiving AFDC also receive income from boyfriends and extended family members, and often have unreported labor income.

The higher maximum credit and the lower phaseout rate combined to expand the phaseout region. Taxpayers with incomes between \$11,000 and \$15,432 became eligible for the credit and faced its phaseout marginal tax rate for the first time in 1987. The constant region was lengthened in 1988, further extending the phaseout region to \$18,576. At every level of earnings the EITC amount after the expansion was at least as large as it was before. Therefore, theory predicts that labor force participation of eligible taxpayers will increase in response to the expansion.

The positive impact of the EITC expansion on the average return to work was reinforced by other elements of the Tax Reform Act of 1986. TRA86 increased the standard deduction for a taxpayer filing as head of household from \$2480 in 1986 to \$4400 in 1988 (the standard deduction for single taxpayers rose from \$2480 to \$3000). TRA86 further reduced the tax liability of taxpayers with children by increasing the deduction per dependent exemption from \$1086 in 1986 to \$1950 in 1988. Finally, the tax schedules were changed. The tax schedule changes were particularly beneficial to head of household filers because the increased standard deduction and exemption amounts meant that in 1988 the typical head of household filer did not jump from the 15 percent tax bracket to the 28 percent tax bracket until her AGI exceeded \$33,565. In contrast, a single filer would begin paying 28 percent on AGI over \$22,800.

In contrast to the positive predicted impact of the EITC expansion on the labor force participation of single workers with children, the expansion should have decreased hours of work for most eligible taxpayers who were already in the workforce. A more detailed discussion of the impact of the 1987 expansion on hours of work is deferred until Section V.

Our estimation strategy compares the labor force participation and hours worked of single women with children before and after TRA86. Most single women with children are eligible for the EITC (if they have appropriate incomes), and if they file tax returns, they usually file as household heads. While the difference between the 1988 and 1986 tax liability of a taxpayer varies by income, we cannot use this variation as the basis of our work because the amount of tax paid by a taxpayer and her labor supply are endogenously determined. Thus, the "treatment" in this natural experiment is not a specific change in tax liability. Rather, it is the entire shift in the budget constraint. In practice, therefore, we rely on time to identify the responsiveness of female

household heads to the EITC and the other aspects of TRA86. Since there may be underlying trends in participation or hours of work and there may be other policy or economic shocks that affect labor market outcomes, we use control groups to allow us to isolate the impact of TRA86 from other factors. A good control group is similar in its characteristics to the treatment group—and therefore likely to respond similarly to the underlying trends or contemporaneous shocks—but does not receive the treatment.

As we explained earlier, eligibility for the EITC depends on the presence of a child in the tax unit and on income being above zero and below the level at which the credit is completely phased out. The expansion of the EITC may, however, affect taxpayers with incomes beyond the level at which the credit is completely phased out since they might reduce their hours (and incomes) and take advantage of the increased credit. Therefore, we use all single women with children as our primary treatment group.<sup>8</sup> We use all single women without children as the control group. The difference between the change in labor force participation of single women with children and the change of single women without children is our estimate of the effect of TRA86 on participation. This is essentially the difference-in-differences approach. It controls for any contemporaneous shocks to the labor force participation of single women with children through the change in participation for the control group. The two identifying assumptions that we make are (1) there are no contemporaneous shocks (other than the tax changes) to the relative labor market outcomes of the treatment and the control groups over the period of the reforms; and (2) there are no underlying trends in participation or hours of work that differ between the two groups.<sup>9</sup>

By including all single women with children in the treatment

8. We are assuming that the taxpayer's marital status and the presence of children in the tax filing unit are exogenously determined. To test whether our results are sensitive to the assumption that fertility decisions are exogenous, we reestimated our basic model using as our treatment group only women who had a qualifying child over age five. Our results did not change.

9. Contamination of the treatment and control groups (which would bias our results toward zero) should not be a large problem in this application. We have checked our allocation methodology using a CPS-IRS match described in Liebman [1995]. We find that 89 percent of women whom we allocate to the treatment group and who file a tax return claim a dependent child on that tax return (80 percent of treatment group filers, file as head of household). Ninety-five percent of women whom we allocate to the control group and who file a tax return, do not claim a dependent child on that tax return (91 percent file as single). If misallocation of individuals to the treatment group and control group happens at random, then these results imply that we should increase our labor-supply results by 19 percent.

group, we are including many taxpayers (those with high incomes) who are unlikely to be affected by the EITC. It also increases the importance of the non-EITC aspects of TRA86, since those effects were larger at incomes beyond the phaseout of the EITC. In addition, the broad treatment group makes it difficult to find good control groups. To focus on the impact of the credit on low-income families, we use two alternative treatment groups. The first is single women with children and low levels of education,<sup>10</sup> and the second is single women with children whom we predict (using exogenous characteristics such as age, race, state, and education) would have earned incomes making them eligible for the EITC. For each of these treatment groups, we use two control groups: single women without children and with low levels of education (predicted income in the EITC range), and single women with children and more than high school education (predicted income above the EITC maximum income). The second control group is more similar to the treatment group on one dimension—they have children—but less similar on another: they have higher education levels (predicted income beyond the EITC range).

The advantage of having multiple control groups is that if we find similar results, we can be more confident that we are estimating the actual effect of the tax reforms and not just the effect of other contemporaneous changes or trend differences between the control and treatment groups. Ultimately, then, the credibility of our results lies in the consistency of our estimates across different treatment and control groups rather than on any one estimate.

### III. DATA

The data we use are from the 1985 to 1987 and 1989 to 1991 March Current Population Surveys. The March CPS is an annual demographic file of approximately 57,000 households. It includes labor market and income information for the previous year, so the data we have are for tax years 1984 to 1986 and 1988 to 1990. We exclude 1987, the first year after TRA86, to allow taxpayers time to adjust their behavior.

The CPS contains information on households, families, and

10. We use two definitions of low education: less than twelve years of education and exactly twelve years of education.

individuals. However, the relevant unit of analysis for this study is the tax-filing unit. Our tax-filing units are based upon CPS families. Therefore, subfamilies (both related and unrelated) are allocated to separate tax-filing units from the primary family. We consider any member of the tax-filing unit who is under the age of 19 (or under 24 and a full-time student) to be a dependent child for tax purposes. We do not impose the support test for dependents because the test includes factors, such as AFDC income, that are endogenous to labor supply decisions. In addition, we do not have enough information to impose the EITC six-month residency test. Therefore, we assume that any taxpayer with a child under the age of 19 (or under 24 and a full-time student) meets both the dependent child and EITC child requirements.

The sample includes unmarried females (widowed, divorced, and never married) who are between 16 and 44 years old. We exclude any female who is separated from her spouse during the reference period, or who was ill or disabled, or in school full time during the previous year. We also exclude any woman with negative earned income (due to negative self-employment income), negative unearned income, or with positive earned income but zero hours of work. The resulting sample size, after pooling all six years, is 67,097 observations.

Table I presents summary statistics of the characteristics of the treatment and control groups. Column 1 presents the characteristics of all unmarried females without children (control); column 2 presents characteristics of all unmarried females with children (treatment). There are some noticeable differences between the two groups. Those who have children tend on average to be older (31.17 versus 26.78 years), less educated (12.05 versus 13.44 years of education), and less likely to have been in the workforce at any time during the previous year (.74 versus .95 probability of annual hours greater than zero). Average earnings for women with children are less than earnings for those without children. Conditional on working, however, the two groups have similar mean earnings. In columns 3, 4, and 5, we present characteristics for women with children who have completed less than twelve years of schooling, twelve years, and more than twelve years, respectively. Again there appear to be systematic differences between the attributes of the groups. The more educated the female head is, the more likely she is to be older, to have a smaller family, and to be a member of the labor force.

These summary statistics suggest that any raw differences

TABLE I  
SUMMARY STATISTICS

Variable	Group				
	Without children	With children			
		All	Education		
			Less than high school	High school	Beyond high school
Age	26.78 (7.02)	31.17 (7.07)	28.67 (7.39)	30.88 (6.79)	33.97 (6.21)
Education	13.44 (2.33)	12.05 (2.28)	9.33 (1.81)	12.00 (0.00)	14.63 (1.54)
Nonwhite	0.15 (0.36)	0.37 (0.48)	0.43 (0.49)	0.37 (0.48)	0.33 (0.47)
Preschool children	0.00 (0.00)	0.48 (0.50)	0.61 (0.49)	0.48 (0.50)	0.36 (0.48)
Filing unit size	1.00 (0.00)	2.74 (0.96)	3.03 (1.17)	2.66 (0.88)	2.60 (0.81)
Earned income	15,119 (13,799)	11,262 (12,498)	4109 (7844)	10,678 (10,679)	18,856 (14,497)
Earnings conditional on working	15,880 (13,708)	15,188 (12,289)	8414 (9475)	13,758 (10,225)	20,589 (13,920)
Labor force participation	0.952 (0.214)	0.742 (0.438)	0.488 (0.500)	0.776 (0.417)	0.916 (0.278)
Weekly participation	0.789 (0.324)	0.603 (0.437)	0.326 (0.415)	0.635 (0.426)	0.803 (0.336)
Hours of work	1531 (814)	1202 (951)	617 (847)	1260 (920)	1640 (812)
Observations	46,287	20,810	5396	9702	5712

Data are from survey years 1985–1987 and 1989–1991 of the March Current Population Survey (CPS). The sample contains *unmarried* women between the ages of 16 and 44. We exclude women who were separated during the previous year, ill or disabled, in school. We also exclude women with negative earnings, negative unearned income, or with nonzero earnings and zero hours of work. All figures are in 1992 dollars. Preschool children is the share of the sample with preschool children. Labor force participation equals one if annual hours are positive, zero otherwise. Weekly participation equals annual weeks worked divided by 52. Standard deviations are in parentheses. Means are weighted with CPS March supplement weights.

in labor market outcomes over time between the treatment and control groups must be interpreted with caution, since the differences could reflect nontax shocks that affect people with some characteristics differently from people with other characteristics. The methods used to control for demographic differences will be critical to our analysis. These results also confirm our earlier point that there is no ideal control group. Only if results are consistent across different specifications will we have strong evidence of a tax effect.

#### IV. EMPIRICAL RESULTS FOR LABOR FORCE PARTICIPATION

##### *A. Basic Participation Results*

Table II presents labor force participation rates for the treatment groups and control groups in the years before and after the Tax Reform Act of 1986. We define labor force participation as working a positive number of hours during the year. We use this definition of labor force participation because it is the one for which the predicted impact of the EITC is unambiguous. In each panel the first column corresponds to the average participation rate prior to TRA86; the second column to the average after TRA86; and the third column to the change in participation. The difference-in-differences estimate of the participation response is in the last column. Panel A presents the results for the first treatment group (all unmarried females with children) and control group (all unmarried females without children). The participation rate of the treatment group increased by a statistically significant 2.4 percentage points (from 72.9 percent to 75.3 percent). There was no change in labor force participation for unmarried women without children. The fact that the participation rate of the control group did not change is important, because it suggests that there is not much of an aggregate effect of which to take account. We would be concerned if there were substantial changes in the participation rate for the control group, because, in that case, our difference-in-differences estimator would depend heavily on the quality of the control group. Our first estimate of the participation response then is 2.4 percentage points, with a standard error of 0.6.

To further examine whether it was the EITC that caused the participation rate of female household heads to rise, we next focus on the subset of females with children who were most likely

TABLE II  
LABOR FORCE PARTICIPATION RATES OF UNMARRIED WOMEN

	Pre-TRA86 (1)	Post-TRA86 (2)	Difference (3)	Difference-in- differences (4)
<i>A. Treatment group:</i>				
With children [20,810]	0.729 (0.004)	0.753 (0.004)	0.024 (0.006)	
<i>Control group:</i>				
Without children [46,287]	0.952 (0.001)	0.952 (0.001)	0.000 (0.002)	0.024 (0.006)
<i>B. Treatment group:</i>				
Less than high school, with children [5396]	0.479 (0.010)	0.497 (0.010)	0.018 (0.014)	
<i>Control group 1:</i>				
Less than high school, without children [3958]	0.784 (0.010)	0.761 (0.009)	-0.023 (0.013)	0.041 (0.019)
<i>Control group 2:</i>				
Beyond high school, with children [5712]	0.911 (0.005)	0.920 (0.005)	0.009 (0.007)	0.009 (0.015)
<i>C. Treatment group:</i>				
High school, with children [9702]	0.764 (0.006)	0.787 (0.006)	0.023 (0.008)	
<i>Control group 1:</i>				
High school, without children [16,527]	0.945 (0.002)	0.943 (0.003)	-0.002 (0.004)	0.025 (0.009)
<i>Control group 2:</i>				
Beyond high school, with children [5712]	0.911 (0.005)	0.920 (0.005)	0.009 (0.007)	0.014 (0.011)

Data are from the March CPS, 1985-1987 and 1989-1991. Pre-TRA86 years are 1984-1986. Post-TRA86 years are 1988-1990. Labor force participation equals one if annual hours are positive, zero otherwise. Standard errors are in parentheses. Sample sizes are in square brackets. Means are weighted with CPS March supplement weights.

to be affected by an increase in the EITC: those with low education levels. Panel B presents participation rates for women with children and less than high school education, compared with women with the same level of education and no children, and also compared with more educated women with children. Panel C repeats the exercise for individuals with exactly twelve years of education. The participation rate before TRA86 was 47.9 percent for women with children and less than a high school education, compared with 78.4 percent for women without children and less than a high school education, and 91.1 percent for women with children and more than a high school education. After TRA86 there is an increase in the participation rate of 1.8 percentage points (from 47.9 percent to 49.7 percent) for the “less than high school” treatment group. There is a 2.3 percentage point *drop* in the participation rate of the first control group (females with less than high school education and no children). Taken together, these figures suggest a participation response of 4.1 percentage points. The second control group, females with children and more than high school education, has a small increase in participation of 0.9 percentage points, producing a difference-in-differences estimate that is also 0.9. Since many single women with children and more than high school education are eligible for the EITC and therefore are likely to be affected by its increase, it is not surprising that the second control group produces a smaller estimate of the treatment effect than the first control group. For the “high school” treatment group, shown in Panel C of Table II, the corresponding range of estimates is 1.4 to 2.5 percentage points.<sup>11</sup>

These results suggest that the labor force participation of unmarried heads of households increased following the Tax Reform Act of 1986. We do not observe a similar increase in the control groups. We observe larger percentage point responses among female heads with twelve or fewer years of schooling than among women with more education. This is encouraging since they are the most likely to be affected by the EITC.<sup>12</sup>

11. Because the level of participation for the treatment group differs from the level for the control group, the tax effect could be sensitive to the way in which we define the participation change. For example, we could find a greater percentage point increase in participation for the treatment group than for the control group, while finding a smaller percent reduction in nonparticipation. Because all of the without children control groups have either zero or negative changes in participation, our main qualitative results are not sensitive to the specification of the participation effect. However, our results comparing women with children and different levels of education are sensitive to the measure chosen.

12. Since the participation rate of the control group is so high (95 percent), a potential concern is that there is not much scope for the rate to rise after TRA86.

### B. Regression Results

Because the treatment and the control groups differ in demographic characteristics, the observed differences in participation outcomes may reflect underlying differences between the treatment and control groups rather than a treatment effect. Controlling for demographic characteristics in a difference-in-differences approach is important if the composition of the treatment or control groups changes over time and some demographic characteristics are correlated with the dependent variable. In addition, controlling for demographic characteristics reduces the residual variance of the regression and produces more efficient estimates. Finally, by interacting demographic characteristics with a time dummy, we are able to reduce the chance that unknown shocks that differentially affect people with different characteristics are producing a false treatment effect.

We estimate the probit equation:

$$(1) \quad P(lfp_{it} = 1) = \Phi(\alpha + \beta \mathbf{Z}_{it} + \gamma_0 treatment_i + \gamma_1 post86_i + \gamma_2 (treatment \times post86)_{it}),$$

where  $lfp$  is a dummy equal to one if a woman reported working at least one hour during the previous year. In our basic specification,  $\mathbf{Z}_{it}$  is a vector that includes unearned income, number of children, family size, number of preschool children, age and its square and cube, education and its square, and a dummy variable for race (=1 if nonwhite).  $\mathbf{Z}_{it}$  also includes year dummies for 1984, 1985, 1989, and 1990. These variables control for observable differences in the characteristics of the treatment and control group that affect the level of labor force participation. Unobservable differences are controlled for by the variable,  $treatment$ , which is equal to one for any woman who has a child in her subfamily (and is therefore eligible for the EITC and likely to file as a household head). We expect  $\gamma_0$  to be negative if women with children have

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The evidence using the less than high school control group (with a participation rate of 78 percent) provides some reassurance on this point. In addition, we examined two other potential control groups: low-educated married women without children and low-educated single men without children. The labor force participation of the married women increased by 0.2 percent, from 83.9 to 84.1 percent, after TRA86, providing further evidence that the 2.3 percent increase observed for single women with children is larger than that observed for other groups in the economy. The labor force participation of single men rose from 93.5 percent of 94.5 percent. We take this as evidence that our methodology would have been capable of observing an increase in labor force participation by single women without children if one had occurred, even though they started from a high level of participation.

lower participation rates than their counterparts without children, even after controlling for other observable demographic characteristics. *post86* is a dummy equal to one for any tax year after 1986.  $\gamma_1$  therefore reflects the average change in labor force participation for both treatment and control groups between 1986 and 1988, the omitted year-dummies in the regression.

A test of the impact of TRA86 is a test that eligible, unmarried women with children increased their participation after 1987 relative to unmarried women in the control group. It is a test that  $\gamma_2$ , the coefficient on the interaction term between *post86* and *treatment*, is greater than zero. Thus, our hypothesis tests are one-tailed tests (the ninety-fifth percentile of the *t*-distribution is 1.64).

Table III presents results in which we use the presence of children as our measure of eligibility for the EITC and the head of household filing status (*kids* replaces *treatment* in equation (1)). The sample is all unmarried women. The first column excludes demographic characteristics, while the second column includes them. The estimated coefficients on the four year dummies (not reported) and *post86* ( $\gamma_1$ ) are small in magnitude and insignificant in both columns, suggesting that there is no overall trend in average participation for the two groups. The coefficient on *kids* ( $\gamma_0$ ) changes dramatically once demographic characteristics are included: from  $-1.053$  to  $-0.250$ . This result should not be surprising since females with children have different attributes than women without children. The fact that  $\gamma_0$  remains significant even after controlling for observable characteristics suggests that having a child reduces labor force participation even controlling for observable demographic variables or that there are unobservable differences across the two groups. In spite of these differences, however, the treatment effect ( $\gamma_2$ ) changes little when we include demographic characteristics as regressors: it rises from 0.069 to 0.074 (with a standard error of .030). This result suggests that any changes in the demographic composition of the treatment and control groups that occurred over time are uncorrelated with the treatment. The coefficients on the other demographic characteristics all have the expected signs. Females with unearned income have lower probabilities of participation, as do females with preschool children. Older women have lower probabilities of participation, as a cohort effect would predict. Finally, educated women are more likely to be in the labor force than less

educated women (the quadratic term dominates the linear term for years of schooling of two or more).

The probit is a nonlinear model; therefore, the coefficients cannot be used directly as marginal effects. Since the treatment effect variable ( $kids \times post86$  interaction) is discrete, we calculate the effect of the TRA86 by predicting two probabilities of participation, one with the interaction variable set equal to one and the other with the interaction term set equal to zero. The treatment effect is the average (over the sample of post-1987 women with children) of the difference in the two probabilities of participation. The last row in Table III presents estimates of the treatment effect. In column (2) we find that female heads had a 1.9 percentage point higher probability of participating in the workforce as a result of the combined impact of the expansion of the earned income tax credit and the other TRA86 reductions in tax liability for single women with children. The standard error on this estimate is 0.8 percentage points.<sup>13</sup>

### C. Alternative Explanations

The basic finding from both the participation means and the regressions that the relative labor force participation of single women with children increased in the years after 1987 is consistent with TRA86 having a positive impact on labor force participation. However, there are a number of alternative explanations for this finding that need to be examined before we conclude that TRA86 is the most likely explanation for the increase in labor force participation.

Labor force participation rates for all women increased from 37.1 percent in 1959 to 57.4 percent in 1989. If long-run trends in labor force participation differ between females with and without children, then we risk interpreting preexisting differences in labor supply patterns as treatment effects. The top panel of Figure II shows the labor force participation rate for all unmarried females, aged 16 to 44, between 1981 and 1992. We present separate trends for women with and without children. The labor force participation rate for women without children does not appear to be trending either upward or downward during this period. The participation rate for women with children seems to be somewhat more sensitive to the business cycle. There also appears to be an

13. We use the delta method to calculate the standard errors.

TABLE III  
 PROBIT RESULTS: CHILDREN VERSUS NO CHILDREN ALL UNMARRIED WOMEN

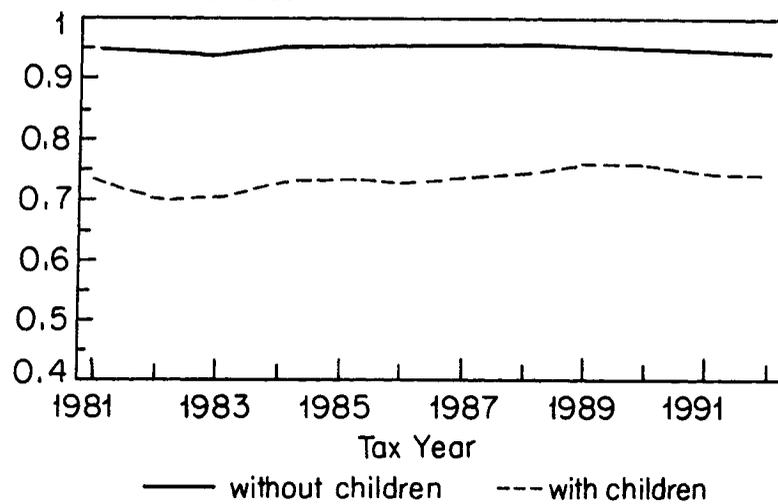
Variables	Sample: all unmarried women					
	Without covariates (1)	Demographic characteristics (2)	Unemployment and AFDC (3)	State dummies (4)	Second child dummy (5)	Separate year interactions (6)
Coefficient estimates						
Other income (1000s)	—	-0.035 (.001)	-0.034 (.001)	-0.034 (.001)	-0.034 (.001)	-0.039 (.001)
Number of preschool children	—	-0.395 (.016)	-0.279 (.018)	-0.281 (.018)	-0.278 (.018)	-0.279 (.018)
Nonwhite	—	-0.422 (.016)	-0.521 (.030)	-0.520 (.031)	-0.518 (.031)	-0.518 (.031)
Age	—	-0.237 (.059)	-0.209 (.060)	-0.195 (.060)	-0.194 (.060)	-0.193 (.060)
Age squared	—	0.007 (.002)	0.006 (.002)	0.006 (.002)	0.006 (.002)	0.006 (.002)
Education	—	-0.020 (.014)	-0.029 (.014)	-0.029 (.014)	-0.029 (.014)	-0.029 (.014)
Education squared	—	0.010 (.001)	0.010 (.001)	0.010 (.001)	0.010 (.001)	0.010 (.001)
Second child	—	—	—	—	-0.118 (.040)	-0.117 (.040)
State Unemployment rate	—	—	-0.096 (.007)	-0.063 (.012)	-0.064 (.012)	-0.064 (.012)
State Unemployment rate kids	—	—	0.028 (.010)	0.029 (.010)	0.029 (.010)	0.030 (.010)
× kids	—	—	—	—	—	—
Maximum monthly AFDC benefit	—	—	-0.001 (.000)	-0.001 (.000)	-0.001 (.001)	-0.001 (.000)

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Kids ( $\gamma_0$ )	-1.053 (.020)	-0.250 (.029)	-1.403 (.106)	-1.438 (.108)	-1.458 (.110)	-1.462 (.110)
Post86 ( $\gamma_1$ )	-0.001 (.028)	0.019 (.031)	-0.152 (.067)	-0.104 (.069)	-0.094 (.069)	
Kids $\times$ Post86 ( $\gamma_2$ )	0.069 (.027)	0.074 (.030)	0.103 (.037)	0.113 (.037)	0.087 (.043)	
Kids $\times$ 1988						0.033 (.057)
Kids $\times$ 1989						0.116 (.058)
Kids $\times$ 1990						0.112 (.057)
Second child $\times$ post86					0.051 (.043)	
Log likelihood	-20759	-17105	-16793	-16633	-16629	-16626
						.008, .029,
						.028 (.014),
						.015), (.015)
<i>Predicted participation response for treatment group</i>		.019 (.008)	.026 (.010)	.028 (.009)	.022 (.009)	

Data are from survey years 1985-1987 and 1988-1991 of the March CPS. The dependent variable is labor force participation. It equals one if the woman worked at least one hour during the tax year. *Post86* equals one for tax years 1988, 1989, 1990. *Kids* equals one if the tax filing unit contained at least one child. In addition to the variables shown, all regressions include year dummies for 1984, 1985, 1989, and 1990. Columns (2) through (6) also include variables for the number of children in the tax filing unit age-cubed. Columns (3) through (6) also include interactions of *age* and *nonwhite* with *post86* and with *kids*. Columns (4) through (6) also include a full set of state dummies. Column (5) also includes interactions of *second child* with the year dummies for 1988, 1989, and 1990. The number of observations is 67,097. Standard errors are in parentheses. Regressions are weighted with CPS March supplement weights.

## All Unmarried Females



## Unmarried Males With Less Than High School Education

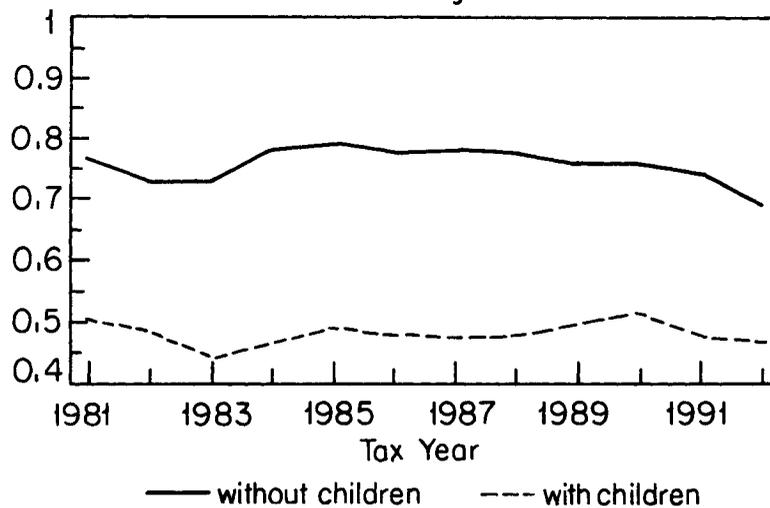


FIGURE II  
Labor Force Participation Rates 1981 to 1992, Unmarried Females Ages 16-44

increase in labor force participation after 1986 for women with children, while the rate for women without children trends upward only slightly. The bottom panel of Figure II shows the same trends for women with less than high school education. Once again, there is no evidence that the two groups have different long-run trends.

In order to rigorously check these visual impressions, we estimated a probit regression of labor force participation on thirteen year dummies, a dummy for children, and interactions of the children and year dummies. To control for changes over time in the demographic composition of the sample, we also included all the demographic variables from column (2) of Table III. The marginal effects of the interaction variables represent annual deviations from the average difference in participation between females with children and females without children. These marginal effects and the maximum EITC are plotted in the top panel of Figure III for all women and in the bottom panel of Figure III for women with less than high school education. The two figures show quite clearly that the difference in participation rates between females with children and females without children declines (the coefficients become less negative) following the 1987 increase in the maximum credit. The participation rate difference seems to track the maximum EITC quite closely with a one- or two-year lag. It seems safe to conclude that the response estimated for the 1987 expansion does not reflect differing trends in the labor force participation of females with children and females without children. Indeed, the long-run evidence seems to confirm the conclusion that the relative labor force participation of women with children increased after 1986.

Another possible explanation for our finding that the relative labor force participation of single women with children increased after 1987 is that some other change occurred in the economic environment which affected women with children differently than women without children. Likely candidates are changes in state AFDC benefits, business cycle fluctuations, or unknown shocks that affect people with different demographic characteristics differently. While there was little change in national average AFDC benefits over our period of analysis, there was some cross-state variation in real benefits. For example, between 1986 and 1988, the maximum monthly benefit for a woman with two children increased from \$430 to \$503 (1992 dollars) in New Hampshire, and from \$505 to \$577 in Massachusetts. In New York, on

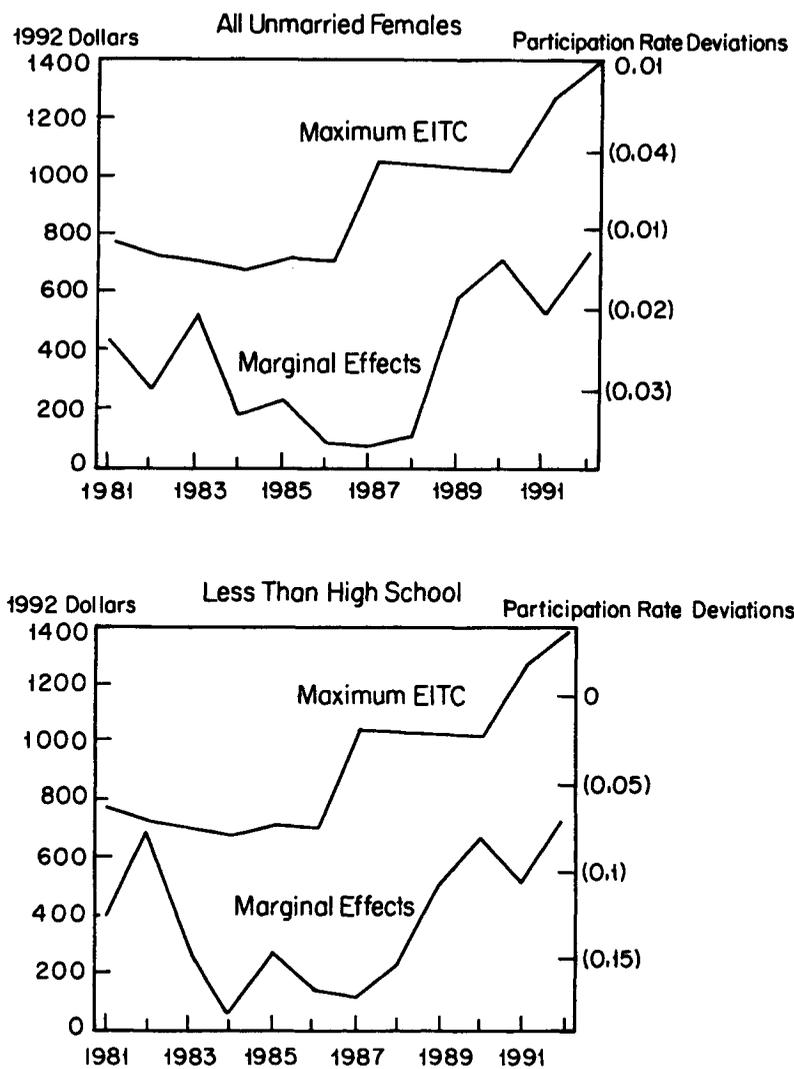


FIGURE III  
Maximum EITC and Marginal Effects from  $KID \times YEAR$  Dummies

the other hand, the maximum benefit fell from \$533 to \$495, and in California it fell from \$638 to \$606. The business cycle could be driving our results if there is a difference between single women with and without children in the sensitivity of their labor

force participation to macroeconomic shocks. Between 1986 and 1988 the national unemployment rate for females fell by 1.8 percentage points, from 7.1 to 5.3 percent. Since both a reduction in the unemployment rate and an increase in the EITC should increase labor force participation, it is not possible to isolate the effects of the credit from the effects of the business cycle using the national unemployment rate. However, research has shown that the employment and earnings status of less educated, younger workers is closely related to state and local labor market conditions [Bartik 1991; Freeman 1991]. Therefore, we use state unemployment rates to purge the effects of general business cycle movements from our treatment effects. Finally, it is possible that the measured EITC response is the result of unknown shocks that are correlated with demographic characteristics that differ between the treatment group and the control groups. For example, nonwhite women may have been induced to enter the labor force during this period for reasons other than TRA86. We have no good story for why this might have happened, perhaps a shock to tastes for work, or perhaps changes in incentives that we have not captured. In any case, since unmarried women with children are more than twice as likely to be nonwhite than are unmarried women without children (37 percent versus 15 percent), such shocks could explain our results. To address these concerns, we include interaction terms between the time dummy and age and race.

Columns (3) and (4) of Table III display results including state AFDC benefits, state unemployment rates, and the interactions between demographic characteristics and time. The unemployment rate is negatively correlated with labor force participation as is the level of monthly AFDC benefits. Surprisingly, the interaction between the unemployment rate and *kids* is positive, suggesting that women with children are less sensitive to the business cycle. The treatment effect,  $kids \times post86$ , rises after controlling for the alternative explanations. The predicted participation response increases from 1.9 percentage points in column (2) to 2.6 percentage points in column (3). When state dummies are added in column (4), the estimated response increases further to 2.8 percentage points. Thus, it does not appear that the alternative explanations we have considered here can account for the relative increase in participation that we observe following TRA86.

#### D. Was the EITC the Cause?

Three other pieces of evidence increase the likelihood that the observed effect was due to the EITC and not to other parts of TRA86 or other government policies. First, the increase in participation is mostly a response to the return to the first child in the tax unit. In the period we study, the amount of EITC a taxpayer received depended only on having a child. No additional benefit accrued from having only one child. Similarly, the advantages of the head of household filing status come from the initial child. In contrast, additional dependent exemptions are available for each additional child. Thus, if families with multiple children were more likely to increase their labor force participation than families with more than one child, then this part of the response was due to the expansion of the dependent exemption and not to the EITC. To disentangle the EITC and head of household effect from the dependent exemption effect, we estimate a regression in which we interact a *second child* dummy with the *post86* dummy. Column (5) of Table III shows that after including the second-child effect, there is still a 2.2 percentage point effect attributable to the first child.

Second, the timing of the post-1987 participation increase is consistent with the result being due to the increase in the EITC. The top panel of Figure III indicates that there was little relative increase in participation by women with children until 1989. The bottom panel indicates that for women with less than high school education, there was some increase in 1988, but most of the increase occurred in 1989. Column (6) of Table III estimates the magnitude of the individual year effects. By 1988 single women with children had increased their relative labor supply by only 0.8 percentage points, but in 1989 and 1990 the impact reached 2.9 percentage points. This timing is consistent with the response being due to the increase in the EITC. Most EITC recipients would have first become aware of the increase around April of 1988 when they received their 1987 tax refund. Assuming that it takes some time to adjust to new incentives, we would expect to have seen a limited response in 1988, and a full response in 1989. Other aspects of TRA86 appeared in weekly paychecks during 1987 and would be expected to have provoked a more rapid response. The finding that most of the increase in relative participation rates occurred in 1989 is evidence that the increase was not caused by the Family Support Act of 1988. States were not

required to implement many of the key provisions of the Family Support Act until mid-1990 [Committee on Ways and Means 1994], so we would have expected it to have had a larger impact in 1990 than in 1989.<sup>14</sup>

The third piece of evidence that the effect we observe is due to the EITC is that it had its largest effect among people most likely to be eligible for the credit. Columns (1) through (3) of Table IV present results with the sample separated by years of education. The specification is the same as column (5) of Table III. The predicted participation response is 6.1 percentage points for the less than high school sample, 2.6 percentage points for the high school sample, and only 0.4 percentage points for the beyond high school sample.<sup>15</sup> When we separate the sample by predicted income region, we obtain similar results.<sup>16</sup> The 86 percent of the sample whom we predict to have earnings in the EITC range have a predicted participation response of 3.6 percentage points, while the predicted high-income individuals have a participation response of  $-0.7$  percentage points.

## V. THE IMPACT OF THE EITC ON HOURS WORKED

### A. Basic Hours Results

The results presented in the previous section show that the relative labor force participation of single women with children increased following TRA86 and suggest that the EITC could have been the cause of this participation increase. However, the EITC expansion is predicted to have reduced the hours worked by many single women with children already in the labor force. Thus, the total impact of the EITC on hours worked is theoretically ambiguous.

14. Some states expanded Medicaid access for families with small children during the years studied in this paper [Yelowitz 1995]. As we explained in footnote 8, restricting our sample to families with children over five years of age does not change our results, so these Medicaid expansions cannot be the source of our findings.

15. A difference-in-differences regression of less than high school versus more than high school, women with children versus women without children, and pre-1986 versus post-1986 (using the same covariates as in Table IV) generates a predicted participation response of 10.6 percentage points.

16. Since the low education groups do not correspond exactly to the EITC eligible population, we estimate an earnings equation using the sample of earners prior to 1987. We estimated an OLS regression of earnings on family size, number of preschool children, the state unemployment rate, and 28 age dummies, 10 education dummies, 2 year dummies, and 1 race dummy. Using the estimated coefficients and individual characteristics, we predict earned income for each woman in the sample.

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Table IV  
 PROBIT RESULTS: CHILDREN VERSUS NO CHILDREN  
 DIFFERENT SUBSAMPLES

Variables	Sample				
	Less than high school (1)	High school (2)	Beyond high school (3)	Predicted earned income in EITC range (4)	Predicted earned income above EITC range (5)
Coefficient estimates					
<i>Kids</i> ( $\gamma_0$ )	-0.663 (.202)	-1.551 (.164)	-1.352 (.264)	-1.427 (.126)	-1.071 (.357)
<i>Post86</i> ( $\gamma_1$ )	-0.232 (.126)	-0.040 (.105)	0.188 (.158)	-0.022 (.078)	-0.151 (.221)
<i>Kids</i> × <i>Post86</i> ( $\gamma_2$ )	0.181 (.083)	0.103 (.062)	0.030 (.098)	0.137 (.049)	-0.048 (.119)
Log likelihood	-5052	-7723	-3380	-13845	-2612
Number of observations	9354	26,229	31,514	51,535	15,562
<i>Predicted participation</i> <i>response for treatment group</i>	.061 (.024)	.026 (.014)	.004 (.011)	.036 (.012)	-.007 (.016)

Data are from survey years 1985-1987 and 1989-1991 of the March CPS. The dependent variable is labor force participation. It equals one if the woman worked at least one hour during the tax year. *Post86* equals one for tax years 1988, 1989, and 1990. *Kids* equals one if the tax filing unit contained at least one child. In addition to the variables shown, all regressions include all the variables from the specification in column (5) of Table III. Standard errors are in parentheses. Regressions are weighted with CPS March supplement weights.

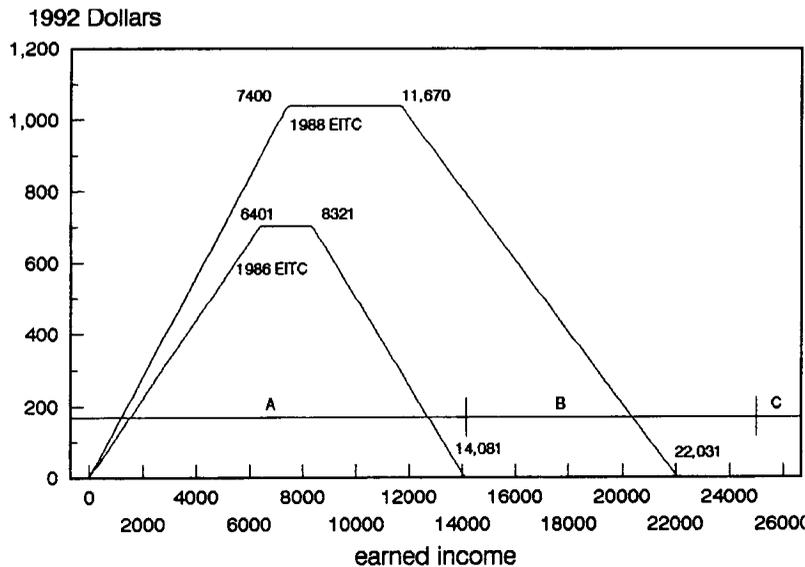


FIGURE IV  
1986 and 1988 Earned Income Tax Credit

Figure IV displays the 1986 and 1988 earned income tax credits (in 1992 dollars) as functions of income. The predicted impact of the EITC expansion on hours of work depends on the taxpayer's income. For most workers in region A (incomes between \$0 and \$14,081), the EITC expansion is predicted to have an ambiguous impact on hours of work since the expansion had offsetting income and substitution effects. Workers in region B (incomes between \$14,081 and \$25,000) are predicted to reduce their hours of work because they are either in the expanded phaseout region and face a 10 percent higher marginal tax rate in addition to having their incomes increased or because they have incomes just beyond the expanded phase-in region and might reduce their hours of work to take advantage of the credit. Workers in region C (incomes above \$25,000) are unlikely to be affected by the increase in the credit.<sup>17</sup>

17. The TRA86 tax rate changes reinforced the effect of the EITC on the hours of work of household heads relative to single filers. TRA86 reduced marginal tax rates by between three and eight percentage points for most single taxpayers with incomes in the EITC phaseout range, while reducing marginal tax rates for household heads by only two to three percentage points. Thus, the substitution effect from TRA86 should cause a larger increase in hours from single taxpayers than from household heads. In addition, as we explained in the participation section, the new TRA86 brackets, through their interaction with the in-

To examine how the EITC expansion affected hours conditional on working and total hours, we estimate OLS regressions that are similar to the probits that we used in Section IV. Thus, we estimate

$$(2) \quad \text{Annual Hours}_{it} \\ = \alpha + \beta \mathbf{Z}_{it} + \gamma_0 \text{kids}_i + \gamma_1 \text{post86}_t + \gamma_2 (\text{kids} \times \text{post86})_{it} + \varepsilon_{it},$$

where  $\mathbf{Z}$  is a vector of demographic variables (with all the variables from the specification in column (5) of Table III),  $\text{kids}$  equals one for unmarried women with children, and the key coefficient is  $\gamma_2$ , the coefficient on the  $\text{kids} \times \text{post86}$  interaction. When we examine the distribution of hours conditional on hours exceeding zero, we are implicitly assuming that any EITC-caused increase in participation in the post-1987 period did not alter the hours distribution. We choose not to impose a selection model on the data for two reasons. First, to identify a selection model, we would need a policy shift that affects participation separately from hours of work. TRA86 does not provide us with such a shift. Therefore, any attempt to estimate a selection model would be heavily dependent on the specification chosen. Second, recent research suggests that inferences in labor supply models are extremely sensitive to the model chosen [Mroz 1987; Zabel 1993]. Our failure to account for new participants should bias upward our estimates of the reduction in hours due to the EITC (i.e., make them less negative). New participants are likely to enter the labor force with earnings and hours below what we predict from their exogenous characteristics. This will occur if unobserved factors (such as a greater taste for leisure) that explain their nonparticipation compared with others with the same exogenous characteristics also cause them to choose fewer hours of work.

In column (1) of Table V the coefficient on the interaction term is 25.22 (with a standard error of 15.18), suggesting that contrary to the predictions of theory, women with children increased their relative hours conditional on working by a small amount. In column (2) the sample is restricted to women with less than high school education. Here there is essentially no change in relative hours for single women with children. Further

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creased dependent exemptions and standard deductions, reduced tax liability by more for head of household filers than for single filers. Thus, the tax bracket income effect works in the same direction as the EITC increase, and hours of work by household heads should fall relative to hours of work of single taxpayers.

## LABOR SUPPLY RESPONSE TO THE EITC

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TABLE V  
HOURS AND WEEKS REGRESSIONS: CHILDREN VERSUS NO CHILDREN

Variables	Annual hours		Annual hours		Annual hours		Annual weeks	
	All single women hours > 0 (1)	Less than high school hours > 0 (2)	All single women (3)	Less than high school (4)	All single women with hours > 0 (5)	All single women (6)	Annual hours	Annual weeks
Coefficient estimates								
Other income (1000s)	-21.83 (.61)	-26.81 (2.93)	-29.92 (.62)	-56.65 (2.46)	-0.433 (.012)	-0.670 (.014)		
Number of preschool children	-66.28 (10.42)	-72.21 (25.57)	-136.49 (9.18)	-107.94 (16.92)	-1.833 (.214)	-3.944 (.207)		
Nonwhite	-140.94 (11.77)	-142.84 (41.29)	-209.80 (12.43)	-266.32 (36.14)	-2.680 (.241)	-4.788 (.281)		
Age	786.82 (22.38)	475.01 (64.29)	576.16 (23.59)	211.04 (54.87)	13.743 (.459)	9.391 (.533)		
Age squared	-21.45 (.75)	-12.62 (2.21)	-15.12 (.80)	-4.79 (1.89)	-0.385 (.015)	-0.252 (.018)		
Education	56.69 (6.41)	14.22 (17.07)	114.90 (6.14)	-56.03 (15.03)	1.262 (.132)	3.086 (.139)		
Education squared	-1.58 (.25)	-0.21 (1.22)	-2.22 (.24)	5.97 (1.05)	-0.041 (.005)	-0.068 (.006)		
Unemployment rate	-9.98 (3.85)	-31.37 (14.58)	-15.94 (4.15)	-42.24 (13.00)	-0.130 (.079)	-0.304 (.094)		
Unemployment rate × kids	5.27 (4.17)	33.60 (13.44)	1.33 (4.14)	34.40 (11.10)	0.054 (.086)	-0.065 (.094)		
Maximum monthly AFDC benefit	-0.22 (.06)	-0.10 (.18)	-0.54 (.06)	-0.14 (.14)	-0.005 (.001)	-0.014 (.001)		
Kids ( $\gamma_0$ )	-83.03 (47.82)	-249.44 (132.61)	-186.48 (46.65)	-327.07 (110.24)	-6.856 (.981)	-11.420 (1.054)		
Post86 ( $\gamma_1$ )	-29.95 (23.61)	63.27 (78.03)	-45.33 (25.20)	-56.27 (69.26)	0.722 (.484)	0.222 (.569)		
Kids × Post86 ( $\gamma_2$ )	25.22 (15.18)	2.98 (46.04)	37.37 (15.31)	83.83 (39.42)	.126 (.311)	.560 (.346)		
Observations	59,474	5700	67,097	9354	59,474	67,097		

Data are from survey years 1985–1987 and 1989–1991 of the March CPS. *Post86* equals one for tax years 1986, 1989, and 1990. *Kids* equals one if the tax filing unit contained at least one child. In addition to the variables shown, all regressions include year dummies for 1984, 1985, 1989, and 1990; variables for the number of children in the tax filing unit; age-cubed; interactions of age and nonwhite with *post86* and with *kids*; and a full set of state dummies. Standard errors are in parentheses. Regressions are weighted with CPS March supplement weights.

results, separating the sample into predicted income regions, find no evidence that the expansion of the phaseout region reduced hours of work for EITC eligible women [Eissa and Liebman 1995].

When we include the participation effect and look at total hours, the interaction coefficient increases from 25.22 to 37.37 for all women and from 2.98 to 83.83 for women with less than high school education. The 81-hour increase for the less than high school educated single women with children is consistent with our earlier finding that the participation rate for this population increased by 6.1 percentage points. Multiplying the increase in participation by average hours conditional on working for the less than high school population (1264) results in a total increase in hours of 77, quite close to the result from the total hours regression. Results for weeks worked, presented in columns (5) and (6) convey a similar story. There was little change in the conditional distribution of weeks worked after TRA86, and there was a larger increase in unconditional weeks worked.

#### *B. Why Do We Observe a Participation Effect But No Hours Effect?*

Economic theory suggests that the 1987 expansion of the EITC should have increased labor force participation and reduced the hours worked by EITC recipients who were already working. Our finding that the expansion did indeed increase labor force participation, but did not reduce hours worked is somewhat puzzling. We offer four explanations.

First, it is common for studies of labor supply to find that labor force participation responds more than hours of work to a change in the net wage [Mroz 1987; Zabel 1993; Triest 1992]. Second, there is strong evidence that many EITC recipients do not know that they receive the credit, and that even those who are aware of it do not understand how it works.<sup>18</sup> Taxpayers do not have to know about or understand the EITC for it to affect their labor force participation, they only have to perceive that they are better off while working than they were on welfare. Since almost

18. Interviews we conducted during August 1993 in Cambridge, Massachusetts, among potential recipients suggested virtually no awareness of the credit (see Eissa and Liebman [1993] for details). This observation was confirmed by the experience of one author (Liebman) as an IRS VITA volunteer in March and April 1994, which revealed that even past recipients were often unaware of the credit. More extensive interviews conducted in Chicago and described in Olson and Davis [1994] similarly found low awareness and understanding of the credit.

all recipients of the EITC receive the credit in a single payment as part of their annual tax refund check and not as part of their weekly paychecks, it is possible that recipients perceive it as a lump sum benefit. In this case the EITC would be predicted to have a positive impact on labor force participation, but only a small negative impact on hours worked via the income effect. Third, it is easier to measure participation than hours worked. If workers report round numbers for hours worked, it will take a large change in hours before the change is noticeable in the data. Fourth, since we observe both participation and hours of work increasing for single women with children relative to single women without children, it is possible that some unknown positive shock can explain our findings.

## VI. CONCLUSION

The 1987 expansion of the EITC and other aspects of the Tax Reform Act of 1986 reduced the relative tax liabilities of EITC-eligible household heads by up to \$1186 (1992 dollars). We estimate that this expansion increased labor force participation among all single women with children by up to 2.8 percentage points, from 73.0 to 75.8 percent. Among single women with children and less than high school education, the impact was even greater—6.1 percentage points. While there are a number of possible explanations for this evidence, we find the combined impact of the 1987 expansion of the EITC and the other provisions of TRA86 to be the most convincing explanation.

Between 1990 and 1996 the maximum earned income tax credit increased from \$1023 to \$3200 (1992 dollars) for a family with two children. Since our methodology did not allow us to estimate the underlying preference parameters of our sample, we cannot make precise predictions of the participation response to the more recent expansions. Our evidence suggests, however, that the recent expansions of the EITC will increase participation by female household heads. There may be decreasing returns to EITC expansions, however, if the nonparticipating population remaining after each increase is farther from the participation-nonparticipation margin.

When we apply our same methodology to hours of work, we find no evidence that the expansion of the EITC decreased hours of work for people already in the labor force. While our finding that the 1987 expansion of the EITC did not decrease hours of

work is encouraging, we think it will be important to reexamine this issue as the EITC expands. Awareness of the EITC is likely to increase as the maximum credit triples, and this could result in a greater sensitivity to the marginal tax rate imposed by the phaseout of the credit. In addition, since the lump sum payment of the EITC may explain the lack of hours responsiveness, it would be unwise to apply these results to other increases in marginal tax rates that operate through regular payroll deductions.

One final point is in order. A full evaluation of a transfer program like the EITC requires more than just an estimate of the distortionary impact of the program on the labor supply of transfer recipients. It also requires information on the value of the additional income received by program beneficiaries as well as the change in the amount of leisure that they consume. This must be balanced against the net income lost by taxpayers and the associated deadweight losses. Since both the welfare payments and the taxes involve deadweight losses, the desirability of the program depends on the weights assigned to changes in income at different income levels. A full comparison among alternative tax and transfer systems would also evaluate the technology of compliance and administration [Slemrod 1990]. This is particularly true in the case of the EITC where the tax system is performing functions that have traditionally been the responsibility of the welfare system [Alstott 1995].

Ultimately, the earned income tax credit is an income transfer program. Compared with other elements of the welfare system, the EITC appears to produce little distortion of work incentives. Therefore, if policy-makers want to redistribute income to the working poor and are comfortable with the trade-offs involved in using the tax system rather than the welfare system to administer transfers, the EITC seems to be a way to do so with minimal efficiency costs.

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## Labor Market Institutions and their Effect on Labor Market Performance in OECD and European Countries

Kamila Fialová, June 2011

The aim of this technical note is to shed some light on relationship between labor market institutions and labor market outcomes in the member states of the Organization of Economic Cooperation and Development (OECD) in North America and East Asia; the New Member States of the European Union who are not members of the OECD (e.g. the Baltic states); countries in the European “Neighborhood” with aspire to accede to the EU (e.g. countries in the Western Balkans); and other European transitions countries (e.g. Ukraine, Moldova, and the Caucasus).

The analysis updates the econometric estimation techniques used in paper by Ondřej Schneider and Kamila Fialová "Labor Market Institutions and their Effect on Labor Market Performance in the New EU Member Countries" on an larger sample of countries. My approach utilizes panel estimation techniques on country level data and variables constructed to capture changes in key labor and social protection institutions over time. Estimations exploit cross-country and time series variability in key variables such as changes in the degree of unionization, the level of the minimum wage, employment protection legislation, and the level of the payroll tax for social insurance.

### **Methodology and data**

For my analysis, I use an econometric model inspired by recent empirical research and by economic theory, set out in Fialová and Schneider (2009). My approach utilizes two-stage least squares regression estimation with instrumental variables on pooled data. Standard panel estimation procedures (random or fixed effects estimation) were not employed for insufficient explanatory power of these models and/or too few data. The source of the data was mainly OECD with some supplements from IZA, WB and Eurostat for the explanatory variables, and the ILO and EBRD for explained variables.

Three data samples are examined:

- i. Sample 1: EU and OECD members in other regions (particularly North America and East Asia)*

Data come from the OECD and, therefore, cover only the OECD members. Time period concerned is 2001-2007.<sup>1</sup>

ii. *Sample 2: The EU15 and New Member States (NMS)*<sup>2</sup>

Source of the data is the OECD again. Utilization of the larger IZA sample was not possible due to the lack of relevant data. That means, the sample covers three NMS with data available only (Czech Republic, Hungary, Poland). Time period concerned is again 2001-2007.<sup>3</sup>

iii. *Sample 3: EU New Member States and aspirants in the European Neighborhood*

Data come from the IZA database and time period concerned covers years 1999, 2003, and 2007.<sup>4</sup> Nine NMS (data for Lithuania, Malta and Cyprus were not available) are covered.<sup>5</sup>

The model examines the impact of institutional factors on four indicators of labor market performance (Eurostat methodology): unemployment rate (*UR*), long-term unemployment rate (*LTUR*), employment rate (*ER*) and activity rate (*AR*). In line with the previous research, the dependent variables are represented in logs. The regression equation has the following form:

$$\ln X_{ti} = \alpha + \beta_1 EPL_{ti} + \beta_2 MW_{ti} + \beta_3 TU_{ti} + \beta_4 TAX_{ti} + \beta_5 ALMP_{ti} + \beta_6 UBRR_{ti} + \beta_7 INFL_{ti} + \beta_8 LEFT_{ti} + \varepsilon_{ti} \quad (1),$$

where *X* takes the form of *UR*, *LtUR*, *ER*, and *AR* in consequent regressions.

Explanatory variables are the following: *EPL* is the second version of the OECD employment protection legislation index covering a wide spectrum of employment protection policies. Minimum wage (*MW*) is a cluster variable constructed according to minimum wage level and its relative share on median wage in the economy. This variable was omitted in the analysis on Sample 3 due to unavailability of the data. The trade unions' power is represented by the trade union density (*TU*).<sup>6</sup> Tax system consequences are reflected by total tax wedge on

<sup>1</sup> The sample covers 24 countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, the Netherlands, Norway, New Zealand, Poland, Portugal, Spain, Sweden, United Kingdom, and United States. 17 countries are classified as EU OECD, 7 countries as non-EU OECD.

<sup>2</sup> The new member states group ("NMS") for the purpose of this analysis generally consists of countries acceding to the EU in 2004 and 2007.

<sup>3</sup> The sample covers 18 countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, and United Kingdom. 15 countries are classified as old EU, 3 countries as NMS EU.

<sup>4</sup> For some countries, only some of these years with data available were covered.

<sup>5</sup> The sample covers 15 countries: Albania, Bulgaria, Czech Republic, Estonia, Croatia, Hungary, Kyrgyzstan, Latvia, Moldova, Macedonia, Poland, Romania, Slovenia, Slovakia, and Ukraine. 9 countries are classified as NMS EU, 6 countries as European Neighborhood.

<sup>6</sup> Trade union density refers to the share of workers who were trade union members. However, even if the density is rather low in some countries, it is a common practice to extend trade union agreements to nonunionized workers, thus covering a large share of employees in the economy (e.g., France and Spain). Thus, the real degree of collective bargaining coverage—the share of all salary earners whose wage is actually

labor (*TAX*).<sup>7</sup> Finally, to reflect the influence of labor market policies (LMP), expenditure on active LMP as % of GDP per percentage point of unemployment (*ALMP*) and initial unemployment benefits replacement rate (*UBRR*) is included. Active labor market policies expenditure is instrumented.<sup>8</sup> In the analysis on Sample 3, initial unemployment benefits replacement rate was replaced by two other indices available from IZA: the average unemployment benefit (*UNBEN*) and maximum duration of unemployment benefits (*UNBENDUR*) to reflect the effects of passive labor market policy spending.<sup>9</sup>

The actual rate of unemployment is utilized in the regressions, but labor market institutions affect rather the equilibrium unemployment. To reflect this, additional variable was used in the model—the change in the annual rate of inflation (*INFL*; see Nickell, 1997). This variable captures the influence of economic cycle and may be also considered an indicator of macroeconomic policy stance. Finally, unemployment level might be in reality also influenced by political preferences of governments and conflict of interest over the power resources (see for instance Korpi, 1991). To account for these political factors, one more variable was added in the regression model—the government orientation with respect to the economic policy. Variable *LEFT* is a dummy acquiring 1 for parties defined as communist, socialist, social-democratic or left-wing, where we expect greater orientation on social issues resulting in lower unemployment.<sup>10</sup> As economic policy takes time to influence labor market performance, we use the *LEFT* dummy with a one year lag.

The model analyzes mainly the basic correlations between labor market performance and labor market institutions. Its deeper explanatory power is rather limited, due to the lack of data on more countries and other relevant variables that might affect the dependent variables.<sup>11</sup> Moreover, only three NMS are covered in Sample 2 and, therefore, it is impossible to run a separate analysis for this group of countries. Generally, I examine only the differences in the role of institutions between the whole region and one particular sub-

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determined by a collective agreement in a legal extension of bargained wage rates to nonunionized workers—would be a preferred indicator; unfortunately, such data is not available for the examined period and country sample.

<sup>7</sup> Total tax wedge on labor represents the combined central and sub-central government income tax plus employee and employer social security contribution taxes, as a percentage of labor costs, defined as gross wage earnings plus employer social security contributions; the tax wedge includes cash transfers (source: OECD). The indicator is calculated for a single individual without children, earning the average wage.

<sup>8</sup> This variable is endogenous because it relates the expenditure to the actual rate of unemployment. For this reason, we instrumented this variable by a new variable relating the expenditure to the average unemployment rate in a five-year period before the actual year.

<sup>9</sup> Average unemployment benefit is the average benefit as percentage of the average wage. This definition deviates from the estimates typically used by the OECD because OECD replacement rates are not very meaningful in the transition countries due to the caps on the size of the benefit in many countries. Maximum duration of unemployment benefits is defined as the period for which a person aged 40 years who has been employed for 22 years prior to unemployment receives unemployment benefits, wherever possible. The source of the data is IZA.

<sup>10</sup> The source of the data is the World Bank's database of political institutions; for details, see Keefer (2005).

<sup>11</sup> These are, for example, the role of product market reforms (Boeri, 2005; Griffith et al., 2006) or the importance of adverse economic shocks (Blanchard and Wolfers, 2000).

sample—and their implications for the other sub-sample—using a modified Chow test (see also Cazes and Nesporova, 2003).<sup>12</sup>

## Results

### UNEMPLOYMENT RATE (UR)

**Table 1. Regression estimation results – Unemployment rate**

	OECD			European Union			NMS EU+European Neighborhood		
	Total OECD	EU OECD	non-EU	Total EU	Old EU	NMS EU	Total	NMS EU	Neighborhood
ALMP	-0.327 ***	-0.314 ***	0.624	-0.198 *	-0.118	0.397	-1.249 **	-0.444	-31.016
TAX	0.021 ***	0.013 ***	0.016	0.018 ***	0.026 ***	-0.099 ***	0.020	-0.021	-0.047
EPL	0.146 ***	0.378 ***	-0.166	0.350 ***	0.383 ***	-0.027	0.538 **	0.123	2.793
MW	0.010	-0.037 *	0.204 ***	-0.018	-0.008	0.325 **			
TU	-0.001	0.000	-0.008	-0.002	-0.002	-0.058 ***	-0.007	-0.029 **	-0.033
UBRR	-0.002	-0.009 **	0.019 ***	-0.012 ***	-0.015 ***	0.009			
UNBEN							-0.024 *	-0.010	0.103
UNBENDUR							0.029	0.039	0.128
INFL	-0.033	-0.058	0.044 *	-0.040	-0.005	0.016	-0.004	-0.051 **	-0.011
LEFT	0.125 **	0.107 *	-0.161 *	0.133 **	0.081	0.876 ***	0.298	0.087	-1.463
Constant	0.982 ***	1.274 ***	0.046	1.174 ***	0.808 ***	5.724 ***	0.785	3.218	-1.603
R sq.	0.378	0.401	0.787	0.345	0.495	0.889	0.369	0.583	0.856
N	168	119	49	126	105	21	30	19	11
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.068	0.146
Chow test F p-value	0.9838			0.916			0.6765		

Source: OECD, IZA, World Bank, ILO, EBRD, own calculations

Note: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level. Regression method: pooled two-stage least squares procedure with instrumental variables on panel data; robust standard errors utilized.

#### • EU and OECD members in other regions

Active labor market policy expenditure, EPL, and tax wedge on labor have significant effects on UR in total OECD sample. While high taxation of labor and strict employment protection legislation tend to increase UR, larger active LMP expenditure offsets this effect and tends to reduce unemployment. Similarly, unemployment benefit initial replacement rate has a negative effect.

Estimation results for European countries only are similar to those for total OECD sample. Moreover, minimum wage exerts a negative effect on explained variable, which is, however, significant at 10% only. Furthermore, unemployment benefit initial replacement rate shows a significant negative influence.

<sup>12</sup> A modified version of the test hypothesis and statistics was used, because number of observations in the NMS group is smaller than the number of parameters,  $n_{NMS} < k$ , and thus I can not use the standard methods in this case. We test the hypothesis  $H_0: E(y | X; \beta_{OE}) = E(y | X; \beta_{NMS})$ . This is done by calculating the statistic

$$F = \frac{\frac{SSR_T - SSR_{OE}}{n_{NMS}}}{\frac{SSR_{OE}}{n_{OE} - k}} \approx F(n_{NMS}, n_{OE} - k).$$

Estimation results significantly differ for OECD countries outside Europe – minimum wage has a significant positive effect on UR; unemployment benefit initial replacement rate has a significant positive effect, too. Other labor institutions show insignificant effects in this group.

While the effects of active labor market policies, employment protection legislation and labor taxation are in line with economic theory and results of existing empirical research on this topic, the results for minimum wage and unemployment benefit initial replacement rate deserve more attention. My estimates show that the minimum wage tends to increase unemployment in non-European OECD sample, which is in accordance with the text-book pricing out effect. That means that it is mainly the Americans, Canadians, and North East Asians for whom the minimum wage might have adverse impact on labor market performance. In contrast, minimum wage tends to reduce unemployment in Europe, but this effect is significant at 10% only. Furthermore, the effect of unemployment benefit initial replacement rate is similarly ambiguous. While the generosity of unemployment benefits shows a negative effect on unemployment in Europe (might reflect its influence on matching processes), non-European sample recorded a positive sign of the regression coefficient, indicating a stimulating effect on unemployment.

To examine the potential differences in the role of explanatory variables between the two OECD sub-samples I applied modified Chow tests, as described above. Although some of the estimated coefficients suggest different behavior of these sub-regions, the tests' results did not reject the hypothesis of stability of regression coefficients between these two groups on the 5% significance level.

- *The EU15 and New Member States*

EPL, tax wedge on labor, active LMP expenditure and unemployment benefit initial replacement rate have significant effects on UR in total EU sample. While higher taxes on labor and stricter EPL increase UR, larger active LMP expenditure and higher unemployment benefit initial replacement rate have negative effects. The effect of active LMP expenditure is, however, significant at 10% only.

Estimation results for old European countries only are similar to those for total EU sample with an exception of active LMP expenditure, the effect of which becomes insignificant.

Estimation results significantly differ for new EU countries – minimum wage has a positive effect on UR; in contrast, higher trade union density has a negative effect, similarly to higher labor taxation. However, reliability of the model specification for this sample is lower due to low number of observations (21; 3 countries).

Again, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *EU New Member States and aspirants in the European Neighborhood*

Three labor institutions have a significant effect on UR in total sample: EPL, active LMP expenditure and average unemployment benefit. While EPL increases UR, active LMP expenditure and average unemployment benefit have negative effects.

Model specification on the two sub-samples (EU NMS and European Neighborhood countries) does not fit the data. All the regression coefficients are insignificant in sample of European Neighborhood countries. Trade union density has a significant coefficient in NMS sample, indicating a negative impact of trade union on unemployment level.

Similarly to the two previous cases, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

## LONG-TERM UNEMPLOYMENT (LTUR)

**Table 2. Regression estimation results – Long-term unemployment rate**

	OECD			European Union			NMS EU+European Neighborhood			
	Total OECD	EU OECD	Total	Total	Total	NMS EU	Total	NMS EU	Neighborhood	
ALMP	-0.639	-0.975 **	1.802	-0.683	-0.636	0.779 *	-9.916 **	-	***	
TAX	0.097 ***	0.036 ***	0.070	0.051 ***	0.068 ***	-0.091 ***	0.068	0.018		
EPL	0.185	0.234	-1.354 *	0.179	0.139	0.068	-1.513	-1.611		
MW	0.135 **	-0.054	0.418 ***	-0.004	0.033	0.235 **				
TU	-0.012	-0.016 *	0.023	-0.022 **	-0.021 **	-0.034 **	0.015	-0.103 **		
UBRR	-0.015 ***	-0.004	0.004	-0.012	-0.015	0.012				
UNBEN							-0.073	-0.007	Insufficient number of observations	
UNBENDUR							0.119	0.181 **		
INFL	-0.133	-0.210 *	0.149	-0.167	-0.352	0.015	0.086	-0.110		
LEFT	-0.177	-0.458	-0.957 **	-0.350	-0.413	0.864 ***	0.684	0.420		
constant	-2.466 ***	0.392	-2.574	0.114	-0.513	3.827 **	4.223	6.899		
R sq.	0.363	0.281	0.681	0.279	0.285	0.915	0.763	0.853		
N	168	119	49	126	105	21	18	17		
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.180	0.067		
Chow test F p-value	0.9965			0.7392			x			

Source: OECD, IZA, World Bank, ILO, EBRD, own calculations

Note: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level. Regression method: pooled two-stage least squares procedure with instrumental variables on panel data; robust standard errors utilized.

- EU and OECD members in other regions

Tax wedge on labor, minimum wage and unemployment benefit initial replacement rate have significant effects on LTUR for total OECD sample. While taxes and minimum wage tend to increase LTUR, unemployment benefit initial replacement rate has a negative effect. (Both minimum wage and unemployment benefit initial replacement rate showed insignificant effects for total unemployment rate.) The effects of other labor institutions are insignificant.

Estimation results for European countries only show significant effects of a slightly different set of institutional variables. While the stimulating effect of labor taxation on long-term unemployment was confirmed, it tends to be offset by negative effects of active labor market policy expenditure and higher degree of trade unionization (the effect of trade unions was insignificant for total unemployment).

Estimation results significantly differ for OECD countries outside Europe – minimum wage has a significant positive effect on LTUR and EPL exerts a negative influence, which is, however, significant at 10% level only. All other labor institutions show insignificant effects in this group.

Again, European and non-European OECD members seem to have different drivers of the long-term unemployment. While high labor taxation is the main issue in Europe, other OECD members seem to suffer the most from the minimum wage legislation.

Similarly to the previous analysis of the unemployment rates, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *The EU15 and New Member States*

Tax wedge on labor and trade union membership have significant effects on LTUR in total EU sample. While taxes increase LTUR, trade union membership has a negative effect.

Estimation results for old European countries only are similar to those for total EU sample.

Estimation results significantly differ for new EU countries – minimum wage has a significant positive effect on LTUR; in contrast, greater trade union density and higher taxation of labor exert negative effects. Active labor market policy expenditure tends to have a positive effect, significant at 10% only. Still, reliability of the model specification for this sample is lower due to low number of observations (21; 3 countries).

Again, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *EU New Member States and aspirants in the European Neighborhood*

Reliability of model estimates on this sample is rather problematic due to a very low number of observations. Due to this limitation, the results must be taken with caution.

No labor institutions but active labor market policy expenditure have significant effect on LTUR in total sample. Active labor market policy expenditure tends to reduce long-term unemployment.

The results change modestly when EU NMS only are considered: active LMP expenditure holds its significant negative effect and trade union density turns out to have a significant negative effect, too.

There is not enough data for model specification on the European Neighborhood countries sub-sample (one country).

## EMPLOYMENT RATE (ER)

**Table 3. Regression estimation results – Employment rate**

	OECD			European Union			NMS EU+European Neighborhood		
	Total OECD	EU OECD	Total	Total	Total	NMS EU	Total	NMS EU	Neighborhood
ALMP	0.085 ***	0.100 ***	-0.061	0.078 ***	0.070 ***	-0.119	0.087	0.044	2.531
TAX	-0.009 ***	-0.008 ***	-0.004 ***	-0.009 ***	-0.010 ***	0.016 ***	-0.003	-0.009	0.005
EPL	-0.057 ***	-0.063 ***	-0.071 ***	-0.058 ***	-0.066 ***	0.122	-0.069	-0.026	-0.373
MW	-0.004	-0.005	-0.025 ***	-0.009 *	-0.008 *	-0.086 ***			
TU	0.001 ***	0.001 ***	0.006 ***	0.001 ***	0.001 ***	0.027 ***	0.000	0.009 ***	0.002
UBRR	0.003 ***	0.003 ***	-0.003 ***	0.004 ***	0.004 ***	0.001			
UNBEN							0.005	0.001	-0.009
UNBENDUR							-0.005	-0.009 **	-0.034
INFL	0.005	0.009	-0.008 **	0.006	0.002	-0.008	0.001	0.010 ***	0.002
LEFT	0.009	0.017	0.026 **	0.009	0.015	-0.215 ***	-0.100 **	-0.070	0.117
Constant	4.201 ***	4.171 ***	4.408 ***	4.192 ***	4.227 ***	2.796 ***	4.179 ***	4.254 ***	4.819 **
R sq.	0.664	0.622	0.707	0.621	0.671	0.822	0.249	0.695	0.668
N	168	119	49	126	105	21	30	19	11
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.198	0.003	0.736
Chow test F p-value	0.5037			0.9999			0.8499		

Source: OECD, IZA, World Bank, ILO, EBRD, own calculations

Note: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level. Regression method: pooled two-stage least squares procedure with instrumental variables on panel data; robust standard errors utilized.

- *EU and OECD members in other regions*

All labor institutions but the minimum wage have significant and similar effects on ER in both total OECD sample and EU OECD sub-sample. EPL and labor taxation tend to diminish ER, while active labor market programs, trade unions and unemployment benefit initial replacement rate have stimulating effects.

The situation differs in non-EU OECD sub-sample, where EPL, taxation of labor and trade unions act similarly to total sample and EU sub-sample, but unemployment benefit initial replacement rate has an opposite effect on ER (negative). This means that while generosity of passive labor market programs seem to stimulate employment in Europe (might be explained by improved efficiency of matching and functioning of the labor market), it tends to depress employment in non-EU OECD countries (might be explained by abuse of the programs, increased reservation wage of the unemployed etc.). The coefficient of the minimum wage becomes significant with a negative sign in this sub-sample, indicating a diminishing effect on employment. Active labor market programs have insignificant influence on employment level.

Similarly to the previous analysis of unemployment and long-term unemployment, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *The EU15 and New Member States*

All labor institutions exert significant and similar effects on ER in both total EU sample and old EU sub-sample. EPL, minimum wage and labor taxation tend to diminish ER, while active labor market programs, trade unions and unemployment benefit initial replacement rate

have stimulating effects. The coefficient of the minimum wage is, however, significant at 10% only.

On the other hand, taxation of labor has a positive effect on ER in the NMS sub-sample, similarly to trade unionization. Minimum wage tends to have a diminishing effect on ER here. Both passive and active labor market policy indicators and employment protection legislation are insignificant in this sub-sample. However, reliability of this model specification for this sample is lower due to low number of observations (21; 3 countries).

Again, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *EU New Member States and aspirants in the European Neighborhood*

The model does not fit the data for the total sample and for the European Neighborhood sub-sample – no explanatory variable is significant.

Two labor institutions have a significant impact on ER in EU NMS sub-sample: trade union density significantly increases the employment rate; in contrast, duration of unemployment benefits payment significantly reduces employment.

Again, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

## ACTIVITY RATE (AR)

**Table 4. Regression estimation results – Activity rate**

	OECD			European Union			NMS EU+European Neighborhood		
	Total OECD	EU OECD	non-EU	Total EU	Old EU	NMS EU	Total	NMS EU	Neighborhood
ALMP	0.072 ***	0.101 ***	-0.017	0.091 ***	0.117 ***	-0.081	-0.077	-0.036	-1.257
TAX	-0.004 ***	-0.004 ***	0.000	-0.004 ***	-0.005 ***	0.005 **	0.003	-0.015 **	0.011
EPL	-0.029 ***	0.016	-0.106 ***	0.018	0.033 **	0.092	0.017	-0.019	0.060
MW	-0.006	-0.016 ***	-0.014 ***	-0.017 ***	-0.019 ***	-0.042 ***			
TU	0.001 ***	0.001 *	0.006 ***	0.001 ***	0.001 **	0.017 ***	-0.001 **	0.004 ***	-0.001
UBRR	0.003 ***	0.002 **	-0.003 ***	0.002 ***	0.001 *	0.002 *			
UNBEN							0.001	0.001	0.000
UNBENDUR							0.000	-0.004	0.011
INFL	-0.001	0.000	-0.003	-0.001	-0.001	-0.005	0.001	0.005 **	0.002
LEFT	0.008	0.011	0.017 **	0.007	0.000	-0.079 ***	-0.065 ***	-0.054	-0.120
constant	4.257 ***	4.215 ***	4.490 ***	4.225 ***	4.243 ***	3.547 ***	4.081 ***	4.835 ***	3.725 ***
R sq.	0.486	0.643	0.973	0.660	0.638	0.903	0.443	0.743	0.933
N	168	119	49	126	105	21	30	19	11
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.000	0.081
Chow test F p-value	0.5648			0.9999			0.8413		

Source: OECD, IZA, World Bank, ILO, EBRD, own calculations

Note: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level. Regression method: pooled two-stage least squares procedure with instrumental variables on panel data; robust standard errors utilized.

- *EU and OECD members in other regions*

All labor institutions but minimum wage have significant effects on AR in total OECD sample. EPL and labor taxation tend to diminish AR, while active labor market programs, trade union density and unemployment benefit initial replacement rate have stimulating effects.

In the EU sub-sample, the results are quite similar with the exception of two variables – while the EPL becomes insignificant, minimum wage turns out to be significant with a negative effect on AR.

The significance of the EPL coefficient in the total sample was probably driven by non-EU OECD sub-sample, where EPL exerts a significant negative effect on AR. Further, minimum wage and unemployment benefit initial replacement rate have negative effects here, while trade unions have an opposite, diminishing effect. Active labor market programs and labor taxation are insignificant for explaining the heterogeneity in activity rates in non-European OECD countries.

The applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *The EU15 and New Member States*

All labor institutions but EPL have significant and similar effects on AR in total EU sample. Minimum wage and labor taxation tend to diminish AR, while active labor market programs, trade unions and unemployment benefit initial replacement rate have stimulating effects.

The old EU sub-sample gives very similar results, with a little difference in unemployment benefit initial replacement rate becoming significant at 10% only and EPL turning out to have a significant positive effect on AR.

In the NMS sub-sample, taxation of labor has an opposite, positive effect on ER, similarly to trade unionization and unemployment benefit initial replacement (significant at 10% only). Minimum wage tends to have a diminishing effect on AR again. But once again, reliability of this model specification for this sample is lower due to low number of observations (21; 3 countries).

Again, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

- *EU New Member States and aspirants in the European Neighborhood*

One labor institution only has a weakly significant effect on AR in total sample: trade union membership, which tends to exert a negative effect on activity.

In the EU NMS sub-sample, tax wedge on labor significantly depresses activity rate, while trade union density tends to stimulate it.

Model specification on the European Neighborhood sub-sample does not fit and all the coefficients are insignificant.

Finally, the applied Chow tests' results did not reject the hypothesis of stability of regression coefficients between the two sub-regions on the 5% significance level.

## **Conclusions**

Several estimation approaches for different data samples and explanatory variables were used to analyze the impact of labor market institutions on the labor market outcomes in European and OECD countries. Previous research on this topic indicated that the relationship is not straightforward or statistically very robust (see Fialová and Schneider, 2009). Institutions are difficult to define, measure, and compare between countries, and their effect may change over time. This technical note, nevertheless, analyzes the impact of labor market institutions in above-mentioned regions and finds that they do affect major labor market indicators. My findings correspond generally with the previous empirical studies of Cazes and Nesporova (2003) and Nickell (1997) and with major theoretical concepts on this issue.

While the estimations applied on the OECD and European Union samples give consistent and robust results, results of the model applied on the European Neighborhood sample suffer from limited robustness due to limited number of observations available with a relatively many RHS variables. Separate analysis of the EU NMS is a similar case (3 countries only). Therefore, the results for these groups of countries must be taken with caution.

When analyzing the pattern of differences in the unemployment rates, all three samples indicate a positive effect of employment protection legislation on increasing unemployment in examined countries. Similar effect was documented for labor taxation and the minimum wage, although the robustness of these results is weakened by insignificance of the coefficients in some of the samples and negative estimated coefficients of labor taxation on unemployment in European NMS and of the minimum wage on unemployment in EU OECD countries (significant at 10% level only). Furthermore, active labor market policy expenditure tends to reduce unemployment significantly. More generous unemployment benefits mostly tend to influence the unemployment rate negatively with an exception of the non-EU OECD countries. The effect of higher trade unions' power was mostly insignificant in presented results.

While the effects of active labor market policies, employment protection legislation and labor taxation are in line with economic theory and results of other empirical research on this topic, the results for minimum wage and unemployment benefit initial replacement rate deserve a more detailed explanation. The results show that the minimum wage tends to increase unemployment in non-European OECD sample, which is in accordance with the text-book pricing out effect. That means that it is mainly the Americans, Canadians, and North East Asians for whom the minimum wage might have adverse impact on labor market performance. In contrast, minimum wage tends to reduce unemployment in Europe, but

this effect is significant at 10% only. Furthermore, the effect of unemployment benefit initial replacement rate is similarly ambiguous. While the generosity of unemployment benefits shows a negative effect on unemployment in Europe (might reflect its positive influence on matching processes), non-European sample recorded a positive sign of the regression coefficient, indicating a stimulating effect on unemployment.

Taxation of labor showed a positive effect on long-term unemployment across the OECD and EU samples with an exception of EU NMS, where a negative effect seems to be the case (although reliability of this result is limited due to low number of observations). Minimum wage tends to have a significant stimulating effect on long-term unemployment. Again, European and non-European OECD members seem to have different drivers of the long-term unemployment. While high labor taxation is the main issue in Europe, other OECD members seem to suffer the most from the minimum wage legislation. Further, trade union density tends to significantly reduce long-term unemployment in European Union. This might be connected with a high degree of coordination and centralization of the trade unions' claims, which are typical for European countries. The effect of employment protection legislation was generally insignificant in my estimations. Similarly, the effect of unemployment benefits initial replacement rate was mostly insignificant with an exception of a negative effect reported in total OECD sample. Active labor market policy expenditure has an insignificant effect, too.

Turning to explaining the variation in labor supply, the model specification applied on employment rates was able to explain a larger part of the heterogeneity when compared with its explanatory power in the case of both unemployment indicators. Active labor market policy expenditure tends to significantly stimulate employment. Similar effect was registered for trade union density, which might be again connected with the high degree of centralization and coordination. Generosity of passive labor market programs also tends to stimulate employment with an exception of non-EU OECD countries, which registered an opposite effect of this relationship. On the other hand, strictness of employment protection legislation affects employment negatively. Similarly, high labor taxes discourage employment in all the sub-samples but NMS EU. Minimum wage exerts a negative impact on employment in the non-EU OECD and NMS EU sub-samples.

As far as the differences in activity rates are concerned, both strict employment protection and high taxation generally discourage economic activity in examined countries. However, there are two exceptions: firstly, labor taxes tend to support economic activity in NMS EU, which might be, however, considered an unreliable result due to low number of observations. Secondly, EPL shows a positive effect in old European countries. Active labor market programs and trade unions' activity stimulate labor participation. Generosity of passive labor market programs has an ambiguous impact: while it tends to increase economic activity in Europe, the effect on non-European OECD countries is opposite again. The negative effect of the minimum wage seems counterintuitive, but might be explained by

its negative impact on employment. Workers, who lost their jobs as a result of introduction of the minimum wage, might be discouraged from participating in the labor market at all (especially the young and women, who are usually expected to be hit the most).

The results of applied Chow tests examining the potential differences in the role of explanatory variables between the particular sub-samples are inconclusive. Generally, I was not able to reject the hypothesis of stability of regression coefficients between the examined groups of countries in all tested models. While some of the estimated coefficients suggest different behavior, the available data did not allow to study this issue in detail.

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# LABOUR MARKET REFORMS AND OUTCOMES IN ESTONIA

*By: Zuzana Brixiova and Balázs Égert*

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## LABOUR MARKET REFORMS AND OUTCOMES IN ESTONIA<sup>1</sup>

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### Abstract

The unemployment rate in Estonia rose sharply in 2010 to one of the highest levels in the EU, after the country entered a severe recession in 2008. While the rate declined relatively rapidly in 2011, it remained high especially for the less educated. In 2009, the Employment Contract Law relaxed employment protection legislation and sought to raise income protection of the unemployed to facilitate transition from less to more productive jobs while mitigating social costs. Utilizing a search model, this paper shows that increasing further labour market flexibility through reducing the tax wedge on labour would facilitate the structural transformation and reduce the long-term unemployment rate. Linking increases in unemployment benefits to participation in job search or training programmes would improve the unemployed workers' incentives to search for jobs or retrain and the medium term labour market outcomes. Social protection schemes for the unemployed should be also strengthened as initially intended to give the unemployed sufficient time to search for adequate jobs or retrain for new opportunities.

*JEL Classification:* J08, J64, E24.

*Keywords:* Labour market reforms, search model, Estonia, OECD countries

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## 1. Introduction

Following a deterioration during the transition to a market economy and the Russian crisis in the 1990s, the labour market outcomes in Estonia improved markedly by the end of 2007. The employment rate exceeded the EU-15 average and participation rates increased. After entering a recession in 2008, Estonia's unemployment rate escalated from 4.1 percent in December 2007 to 19.8 percent in June 2010 – one of the highest levels in the European Union. Even though real GDP grew by almost 9 percent in 2011, unemployment remained about 13 percent. With high unemployment and the large share of low-value added non-tradable sectors including construction, a pressing issue for policymakers became reallocating workers across jobs and sectors to more productive activities, while mitigating fiscal and social costs. Flexibility of the labour market, together with job creation, became important for strong recovery and medium-term outcomes.<sup>1</sup> At the same time, adequate social support for the unemployed was needed to ensure their minimum living standards and opportunities to improve livelihoods.

Applying the search frameworks of Mortensen and Pissarides (1999) and Van Ours (2007) to Estonia, this paper examines the impact of labour market reforms adopted in the country in 2009 and those expected in 2013, in particular deregulating employment protection and raising unemployment insurance.<sup>2</sup> The analysis suggests that labour market adjustment from unemployment to increased high value-added activities would be eased if: (i) increases in unemployment benefits were made conditional on participation of the unemployed in active labour market programs, especially retraining and job search; (ii) the employers' social security contributions were reduced, and (iii) increases in minimum wages were contained. The reduction of labour taxation, especially for low-wage workers, could also stimulate job creation.

A simulation exercise based on the labour market matching model with active labour market policies of Van Ours (2007) illustrates that *i*) linking unemployment benefits to participation in active labour market programmes reduces unemployment if accompanied by effective job creation incentives; *ii*) in contrast, lowering minimum wages hampers incentives of the low-wage unemployed to search for jobs, but makes firms more willing to hire, with an ambiguous impact on the overall employment; *iii*) cuts in firms' social security contributions stimulate firms' incentives to hire.

The paper is organised as follows. Section 2 outlines the main features of the Estonian labour market, and Section 3 presents the search matching model and policy simulations. Section 4 compares the results for Estonia with some stylised facts for OECD countries, while Section 5 concludes.

## 2. Main characteristics of the Estonian labour market

From 2000 to early 2008, Estonia's labour market outcomes improved markedly: the unemployment rate dropped to close to 4 percent in 2008, its lowest point in 16 years, with long-term and very long-term unemployment rates also falling steadily (Figure 1). At the same time, the employment rate and labour force participation increased. While aggregate outcomes improved, large inequalities persisted among regions, ethnic groups, and workers with different skill levels, with unemployment being particularly high among unskilled workers.

The economic boom, reflected also in eventual skill shortages, led to excessive real wage increases during 2005-07, both in the private and public sectors. Subsequently the gap between real wages and real GDP widened. After having risen sharply to 19.8 percent after Estonia fell into a deep recession in mid-2008, the

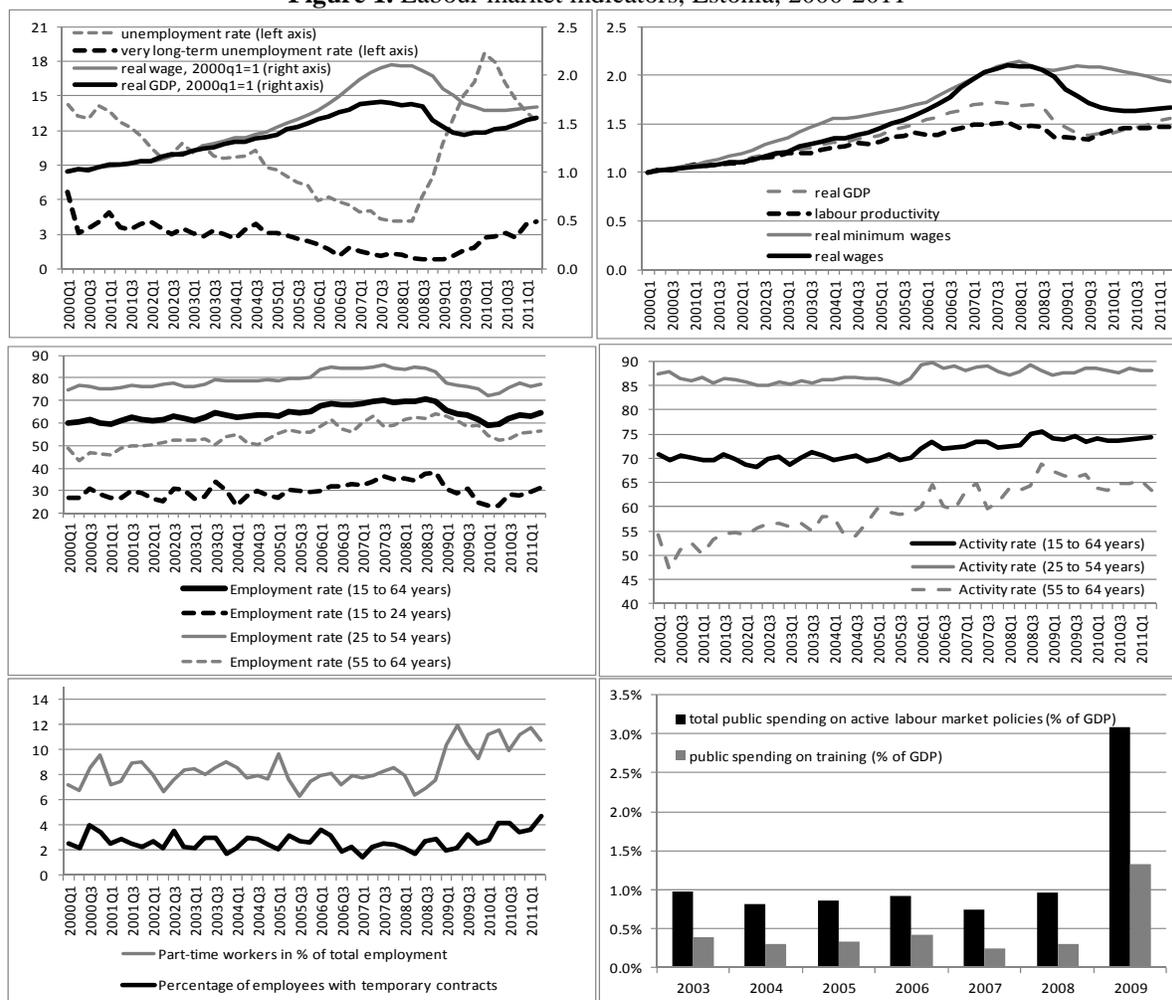
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<sup>1</sup> The need for labour market flexibility is further underscored by the currency board arrangement.

<sup>2</sup> In July 2009, the Employment Contracts Act became effective, which aimed at increasing the labor market flexibility by reducing costs of lay-offs and security through raising unemployment insurance. However, most of the measures aiming at raising security were postponed until 2013 (Leetmaa and Nurmela, 2011).

unemployment rate has been declining and reached 13.3 percent in the third quarter of 2011. The structure of employment has also changed, with the share of workers on part-time and temporary contracts gradually rising since 2008 (Figure 1). Differences across skill levels remained: in Q2, 2010 unemployment rate was 32.7 percent for the uneducated population relative to the 18 percent overall rate (OECD, 2011).

**Figure 1. Labour market indicators, Estonia, 2000-2011**



Source: Authors' calculations based on data drawn from Eurostat and OECD.

Note: Unemployment rate is calculated using Labour Force Survey data. Real wage is the nominal wage divided by the level of the consumer price index.

Besides high unemployment, especially among the less educated workers, the Estonian labour market has the following structural features.

First, it is characterised by a high degree of wage flexibility<sup>3</sup> and almost fully decentralised wage setting, with wages being determined mostly within firms. Exceptions are the setting of the minimum wage, wages in the civil service sector set by government regulations, and wages in selected heavily unionized

<sup>3</sup> Flexibility reflects how quickly the labour markets adjust to shocks (Pissarides, 1997). Four elements are typically discussed: *i*) numerical flexibility, *ii*) working time; *iii*) functional flexibility, and *iv*) the rate at which nominal and real wages respond to changes in supply and demand (Eamets and Paas, 2007).

industries (e.g., textiles).<sup>4</sup> According to Rõõm (2008) and Maivali and Lubenets (2007), wage adjustments in Estonia are frequent, with substantial cyclical fluctuations and sizeable sectoral dispersion. Yet, wage flexibility declined during the boom period: while until 2004 wage increases reflected closely productivity gains (Babecký, 2008; Rõõm, 2008), during 2005-07 real wage increases were largely in excess of labour productivity growth due to labour and skill shortages resulting from rising demand<sup>5</sup>. At 20 and 40 percent respectively, Estonia's 2007 growth in average earnings (including bonuses and overtime) was among the highest and the increase of the civil sector wage was the highest in the EU (Figure 1).

According to a survey by Dabusinskas and Rõõm (2011), wages were downwardly flexible during the crisis especially relative to other European countries. Specifically, in summer 2009, around 46 percent of Estonian firms already cut wages of their workers and another 40 percent intended to do so. Overall, 30 percent of the labour force were impacted by wage cuts, a far larger share than in other countries surveyed.

Second, until 2009, *Employment Protection Legislation (EPL)* in Estonia was more rigid than in other Central European countries or the OECD average (Table 1). The rigidity stemmed from: regulation of regular contracts, notably from long notice periods for workers with short tenure; narrow definition of unfair dismissal; and the right to re-employment or high compensation for unfair dismissal.<sup>6</sup> EPL was eased in 2009: the new Employment Contract Act deregulated comprehensively regular contracts, including i) a reduction in the notice period for redundancy to 15–90 working days, depending on the length of employment; ii) a cut in severance payments, costs of which are shared by the employer and the Unemployment Insurance Fund; and iii) an easing of dismissals and hiring, which facilitates overall mobility and job search of the new job market entrants (OECD, 2004). Estonia's EPL thus became slightly less stringent than in the euro area (Dabusinskas and Rõõm, 2011).

To address concerns about reduced employees' security due to a lighter EPL, the income protection for the unemployed was to be enhanced through raising the unemployment benefit replacement rate and easing the eligibility for unemployment insurance. Specifically, the unemployment income replacement rate was to be raised from 50 to 70 percent during the first 100 days of unemployment, and from 40 to 50 percent afterwards. Those leaving their jobs voluntarily were also to receive unemployment insurance benefits. However, adoption and implementation of these measures have been postponed to 2013 (Leetmaa and Nurmela, 2011). This delay is in contrast with measures of some other European countries that increased unemployment support to safeguard adequate living standards.<sup>7</sup>

Third, before the 2007-08 crisis, expenditures on active labour market policies (ALMPs), as a share of GDP, were very low in comparison to a European or OECD average. ALMPs thus played a minimal role in facilitating workers' employment. Incentives for unemployed workers to search or undergo training were also low. As shown in Figure 1, spending on ALMPs increased markedly to above 3 percent in 2009 from below 1 percent of GDP in 2008.

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<sup>4</sup> Overall though, the rate unionization and the use of collective bargaining coverage in the private sector of the Estonian economy are very low (12 and 9 percent, respectively). Collective bargaining is almost irrelevant for the wage setting process in the overall economy (Dabusinskas and Rõõm, 2011).

<sup>5</sup> A key factor behind the wage flexibility was a widespread use of performance-related bonuses. The 2007 survey of private firms in industry, constructions, services, and trade revealed that about two thirds of firms use bonuses, and their share in the wage bills ranged from 14% in industry to 23% in trade (Dabusinskas and Rõõm, 2008).

<sup>6</sup> Yet, EPL regulations were not adhered to in practice (Eamets and Masso, 2005).

<sup>7</sup> As a response to the global crisis, several OECD countries extending the coverage (Sweden) or duration of their unemployment benefits (Portugal, United States).

Fourth, the minimum wage, determined annually by agreement between trade unions and representatives of employers is low, measured by the ratio of the minimum wage to the average wage at around 30 percent. Yet it was increasing very rapidly until 2007. The increases in the minimum wage in these years exceeded both average real wage growth and labour productivity growth, thus pricing out of jobs low-income workers for whom the minimum wage may constitute a binding constraint. The minimum wage is determined annually at the centralised level and covers all employees. According to Rõõm (2008) and other estimates, approximately 6 percent of private sector workers in Estonia earned the minimum wage in 2008. But the influence of the minimum wage on wage formation goes beyond these six percent – for example, in some cases of unionized enterprises (e.g., textile), minimum wages constitute a basis from which wages of all workers are derived and stipulated in collective agreement.

Finally, Table 1 shows the very high tax wedge on labour, which stands in contrast to a modest overall tax burden on income tax and especially on capital gains: Overhead costs, comprising social contribution tax levied on employers accounted for almost 40 percent of wages in 2006 and remained at that level in 2011. The tax wedge is especially high when compared to OECD countries such as Ireland, the USA or the United Kingdom, whose labour markets are similar to Estonia's (OECD, 2011).

**Table 1. Main characteristics of the Estonian labour market in an international comparison**

	year	Estonia	OECD		
			AVERAGE	MAX	MIN
<b>EPL</b>	2008	2.1	1.94	3.72	0.21
<b>ALMP ( %GDP)</b>	2007	0.1	0.41	1.02	0.05
<b>Minimum wage (% average wage)</b>	2007	32	36.8	49.4	23.5
<b>Net replacement rate (short-term)</b>	2007	59	65.8	87.6	47.6
<b>Tax wedge (at 67% of average worker earnings)</b>	2006	38.4	33.9	49.4	10.6
<b>Long-term unemployment (% total)</b>	2007	52.8	28.9	72.3	0.7
<b>Temporary work contracts (% total)</b>	2007	2.1	12.1	31.7	4.2

Source: OECD and Eurostat.

### 3. A matching model with active labour market policies: application to Estonia

#### 3.1. The model

To illustrate the likely medium-term outcomes of reforming labour market institutions, changes in active labour market programmes (ALMPs), unemployment benefits, minimum wages, and employers' social security contributions are examined in a standard search model, applied to Estonia. Specifically, the model outlined below is a somewhat modified version of Van Ours (2007), which extends the framework of Mortensen and Pissarides (1999) by adding participation in job search and/or training programmes. The application below focuses on the effect of labour market reforms on incentives for the unemployed to search for jobs or to participate in training programmes and for firms to create jobs.

In the model, workers can be either employed in the private sector or unemployed. Unemployed workers receive benefits  $b$ , value their leisure as  $l$ , and search for jobs or put effort in training with intensity  $x \geq 0$  while incurring cost  $k(x) = \frac{x^2}{2\gamma}$ , where  $\gamma > 0$ . Employed workers receive wage  $w$ . Firms post vacancies to fill jobs at cost  $c$ . Each filled job results in output  $y$ , with  $y > w$ . The key component of the model is a matching function  $A = A(xu)^{1-\eta} v^\eta$ , where  $A > 0$  denotes the efficiency of the matching and  $\eta \in (0,1)$  is the elasticity of matches with respect to vacancies. The workers' search/training effort results in job offers,

which arrive at rate  $\mu(\theta)x = A\theta^\eta$ , where  $\theta = \frac{v}{xu}$  denotes the ratio of vacancy rate,  $v$ , to effective unemployment rate,  $xu$ , *i.e.* it describes the tightness of the labour market from firms' perspective. Conversely, firms fill their vacancies at rate  $\frac{\mu(\theta)}{\theta} = A\theta^{\eta-1}$ . All job matches dissolve at rate  $\delta$ , and firms pay to each laid-off worker a severance payment  $K$ . The employment rate,  $e$ , and unemployment rate,  $u$ , change according to:

$$\dot{e} = A\theta^{\eta-1}v - \delta e \quad (1)$$

$$\dot{u} = \delta e - A\theta^\eta xu \quad (2)$$

With normalizing the labour force to 1, that is  $1 = e + u$ , the steady state equilibrium unemployment decreases with search/training effort and the tightness of the labour market:

$$\bar{u} = \frac{\delta}{\delta + A\bar{\theta}^\eta \bar{x}} \quad (3)$$

To illustrate the impact of mandatory participation in ALMPs on workers' search/training effort, a scenario where all unemployed workers can receive unemployment benefit only if they participate in the job search assistance or retraining programme is considered. Participation in such programme lowers the value of leisure for the unemployed by fraction  $z \in (0,1)$  and their search cost by a fraction  $\sigma \in (0,1)$ . Workers accept jobs only when the value of employment,  $V_E$ , exceeds the value on unemployment,  $V_U$ :

$$\rho V_U = \max_x \left( b + (1-z)l - \frac{(1-\sigma)x^2}{2\gamma} + A\theta^\eta x(V_E - V_U) \right) \quad (4)$$

$$\rho V_E = w + \delta(V_U - V_E) \quad (5)$$

where  $\rho$  is the discount rate. Denoting  $J_E$  as value of filled job and  $J_V$  as value of vacancy, the corresponding Bellman equations are:

$$\rho J_E = y - (1+\tau)w + \delta(J_V - J_E - K) \quad (6)$$

$$\rho J_V = -c + A\theta^{\eta-1}(J_E - J_V) \quad (7)$$

Where  $y$  is the output from the filled vacancy,  $w\tau$  is the social employers' contribution tax paid, and  $K$  is the severance cost incurred by the firm. Under the standard assumption of free entry into the job creation, value of posting a vacancy is  $J_V = 0$ . (6) and (7) can therefore be reduced to:

$$\frac{y - (1+\tau)w - \delta K}{\rho + \delta} = \frac{c\theta^{1-\eta}}{A} \quad (8)$$

The optimal search/training intensity  $x$  can be derived directly from (4):

$$\bar{x} = \frac{\gamma}{(1-\sigma)} A \theta^n (V_E - V_U) \quad (9)$$

The search/training effort rises with higher loss of leisure due to participation in the ALMP programme.

To complete the characterization of unemployment outlined in (3), a solution for the tightness of the labour market,  $\theta$ , needs to be obtained through deriving wages. Regarding wage determination, the model deviates from the standard assumption of Nash wage bargaining. Instead, it assumes that flexible wages move with productivity changes:  $w = \phi y$ , where  $\phi \in (0,1)$ , consistent with the empirical evidence (Dabusinskas and Rõõm, 2011; Babecký, 2008; and Rõõm, 2008).

### 3.2. Comparative statics

The comparative statics relevant in the Estonian context are:

**Table 2. Comparative statics in the job search-matching model**

Effect of an increase in:	On search effort of the unemployed $x$	On unemployment rate $u$
Reduced utility from less leisure $z$	+	-
Search cost reduction $\sigma$	+	-
Matching efficiency $A$	+	-
Minimum wage $w^{\min} > \phi y$	+	+
Unemployment benefit $b$	-	+
Payroll tax $\tau$	-	+
Separation rate $\delta$	-	+

The search/training effort of the unemployed rises with effective job search and training programmes, lower search/training cost, improved matching efficiency, and reduced separation rate. The ALMPs can improve matching efficiency (by dissemination of information) as well as reduce search/training cost and separation rate.

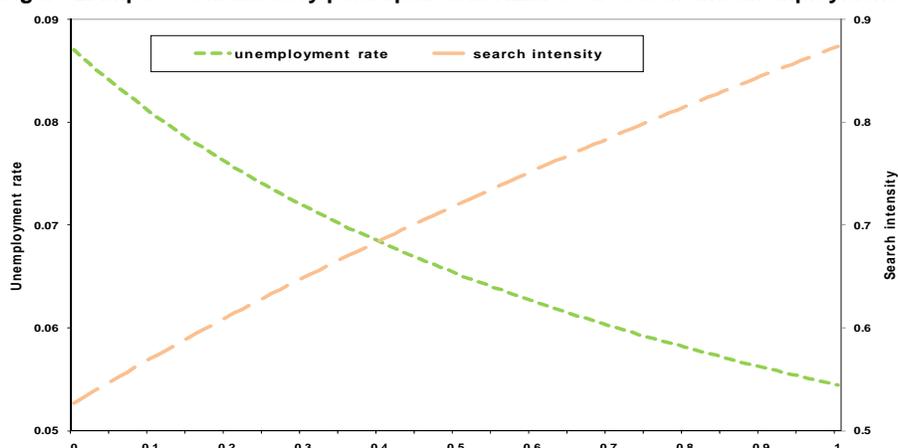
### 3.3. Simulation results

The model is simulated using quarterly parameters from existing studies and the Estonian labour market data. Parameters are specified as follows:

**Table 3. Parameters of the model**

Parameter	Definition	Value	Source
$\gamma$	Output (productivity)	1	Van Ours (2007)
$\delta$	Separation rate (quarterly)	0.045	Statistics Estonia
$\tau$	Social security contribution (% of wage)	0.33	Ministry of Finance, the Republic of Estonia
$c$	Cost of posting vacancies	6	Set so that vacancy-unemployment ratio corresponds to the steady state value of 0.8 (based on past outcomes)
$\eta$	Elasticity of matching to Vacancies	0.5	Van Ours (2007)
$\rho$	Discount rate	0.025	Van Ours (2007)
$A$	Efficiency of matching Function	1	Van Ours (2007)
$b$	Unemployment benefit, Including value of leisure	0.4	Shimer (2005)
$b_u$	Replacement rate (part of $b$ )	0.25	Set at the current rate of 50%
$\gamma$	Cost of job search	0.9	Set to obtain steady state unemployment of 6.5%
$\phi$	Share of wage in output	0.5	Share of compensation of employees in GDP

Figures below illustrate that participation in active labour market programmes, especially job search activation or training programmes, would increase workers search or training efforts through two channels: 1) by reducing the value of leisure and hence increasing relative payoffs from working; and 2) by increasing workers' chance of exiting unemployment. As a result of workers' increased search or training effort, unemployment would decline through both channels. Regarding effective application, programmes encouraging job search would help speed up recovery from cyclical unemployment where new jobs are created in the same sectors and hence workers can draw on existing skill. In contrast, training programmes would typically facilitate structural change, where new jobs are created in new sectors (for example in services rather than construction).<sup>8</sup>

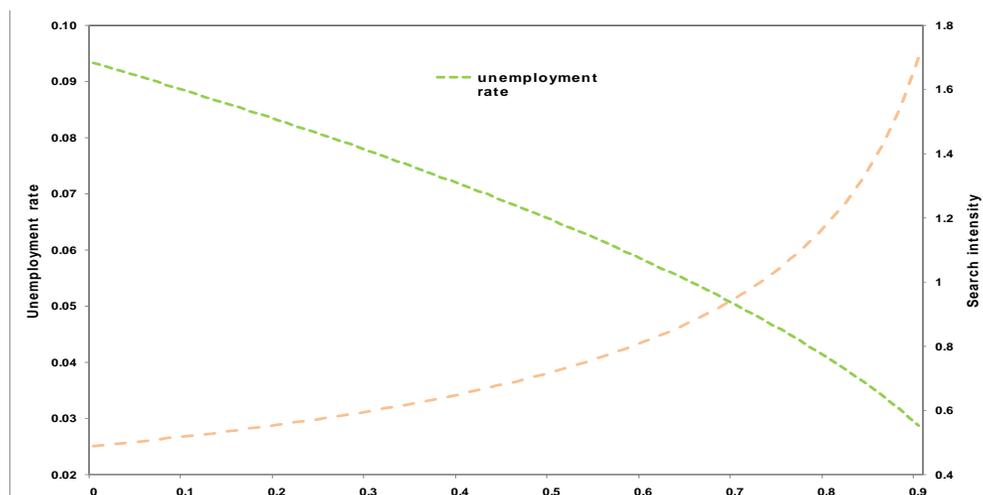
**Figure 2. Impact of mandatory participation in ALMPs on search and unemployment<sup>9</sup>**

Note: Unemployment rate is number of unemployed as % of labour force. For units of consumption good, the price of the consumption good is normalised to one. Mandatory participation represents foregone leisure.

<sup>8</sup> Training programs can also help the unemployed workers maintain or improve the existing skills.

<sup>9</sup> All simulations (Figure 2 – 5) focus on the impact of labour market policies on search effort, that is participation in job search programs. Results apply to participation in training programs as well.

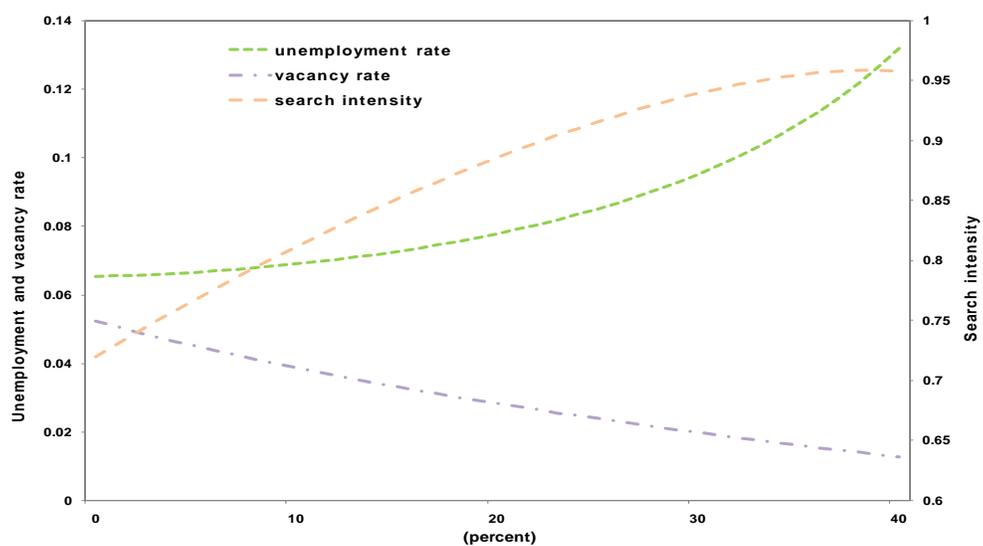
**Figure 3. Impact of search cost cuts on search and unemployment**



*Note:* Unemployment rate is number of unemployed as % of labour force. For units of consumption good, the price of the consumption good is normalised to one.

*Source:* Author's calculations.

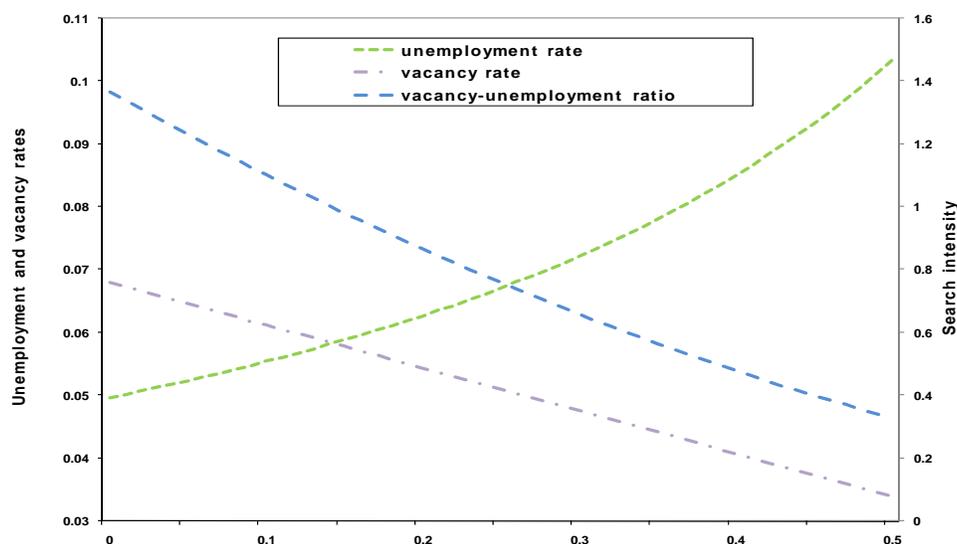
**Figure 4. Impact of minimum wage increase on search, unemployment and vacancies**



*Note:* Unemployment and vacancy rates are respectively the number of unemployed and vacancies as % of labour force. For units of consumption good, the price of the consumption good is normalised to one.

*Source:* Author's calculations.

**Figure 5. Impact of social security tax on vacancies and unemployment**



*Note:* Unemployment and vacancy rates are respectively the number of unemployed and vacancies as % of labour force. The vacancy/unemployment ratio is the vacancy rate divided by the unemployment rate.

*Source:* Author's calculations.

Figure 4 illustrates the impact of increases in minimum wages on the low-wage unemployed workers for whom these wages may constitute a binding constraint. While workers would increase their search/training effort because of a higher payoff from working, the positive impact could be more than offset by firms' posting fewer vacancies because of lower profits. Figure 5 illustrates the likely impact of cuts in social contribution tax paid by employers. The direct consequence would be a higher profitability of firms and hence more vacancies/lower unemployment rate, provided that the lost revenues are replaced by less distortionary taxes.

### 3.4. Policy lessons

The above simulation exercise helps us draw several policy conclusions:

- Linking increases in unemployment benefits to participation in job search or training programmes would improve workers' incentives to search for jobs or put effort into training, by reducing the value of being unemployed and improving their chances of finding a job.
- While lower minimum wages would somewhat hamper incentives of the low-wage unemployed to search for jobs or be retrained, firms would be more willing to hire. The unemployment rate could decline as long as the prevailing minimum wage level is binding.
- A lower tax wedge due to cuts in firms' social security contributions would raise firms' payoff from filled jobs, and hence their incentives to post vacancies. Search or training effort of workers would also increase, as their chances of finding jobs would improve. Both the unemployment level and duration would decline.

### 3.5. *The transition costs*

Although the results presented in the previous section focus on the longer term labour market outcomes, the above measures would also affect the speed of adjustment and the associated transition costs, and hence the political support for reforms. Generally, the speed of adjustment is faster when labour market flexibility is enhanced, underlying for example the importance of reducing the social security tax, especially on low income workers, as a way to ease the recovery and reduce medium term unemployment.

Mourougane and Vogel (2008), who examined the length of adjustments to selected structural reforms in the OECD countries, found that the impact of structural reforms takes several years. As reallocating resources (e.g., labour) is costly, the efficiency gains take time to materialize. Effective monetary policy and well functioning financial markets can reduce the adjustment speed and transition cost through, for example, facilitating the access of new firms to credit. According to the authors, the tax wedge on labour, unemployment replacement ratio, and product market regulations play a major role in explaining the evolution of structural unemployment in OECD countries during 1983–2003. Tax wedge and product market regulations also have the largest impact in the short run. The importance of easing employment protection is in accordance with results of Caballero *et al.* (2004), who found that in countries with strong law enforcement, increasing job security would reduce the annual speed of adjustment to shocks by a third, while subtracting 1% from productivity growth.

While our model illustrations focus on the flexibility aspects of labour market reforms, the experience of other countries from the crisis and other episodes shows that the importance establishing adequate social protection mechanisms that would also help the unemployed search for appropriate jobs or retrain cannot be overstated. Putting differently, too low level of protection may force the unemployed to accept jobs that are not ‘good’ matches and hence increase the job dissolution rate and transaction costs associated with the job matching process.

## 4. **Confronting the results with stylised facts from OECD countries**

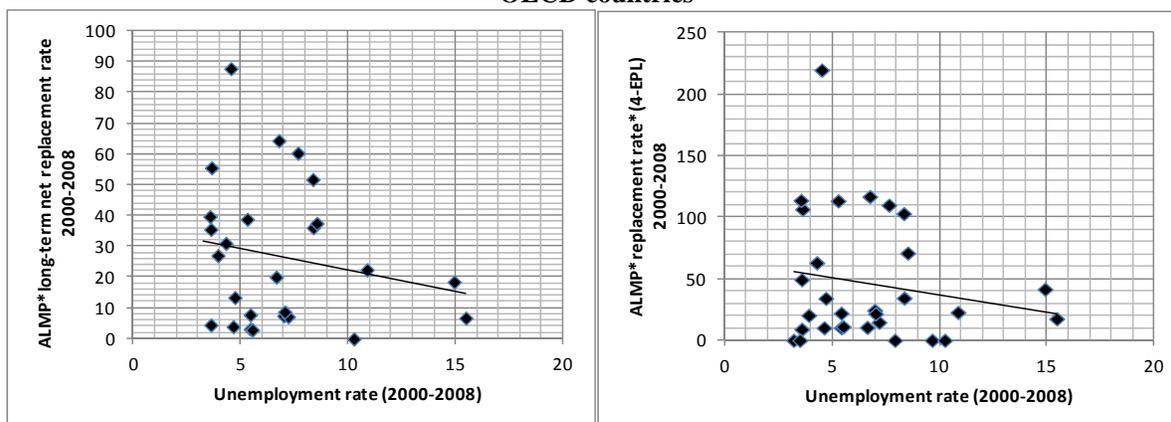
This section seeks to summarise available evidence from OECD countries regarding the impact of labour market reforms aimed to increase flexibility on the level of unemployment. Measures considered are: i.) ALMPs; ii.) the minimum wage; and iii.) the tax wedge.

### 4.1. *Active labour market policies and unemployment*

Over the medium term, increases in ALMPs would enhance workers’ employability and give a larger role to automatic stabilisers. Among various activation approaches, job search assistance or “work first” strategies tend to have a large positive impact and low cost. Long term labour market programmes alone, such as training, often have no or even a negative impact in the short term, but increase employment and earnings 2–3 years after the individuals completed them. Hence mixed strategies combining job search and selective training programme participation seem to be most effective (OECD, 2005a,b).

Well designed and targeted activation policies or training programmes can offset the disincentives due to generous unemployment benefits. For instance, the Danish Flexicurity model, which is based on low employment protection, high expenditures on active labour market policies and generous unemployment benefits conditional on the obligation to take on job offers seems to incentivise firms to create jobs and unemployed persons to take up new job offers. Figure 6 below shows that the combination of extensive ALMP with higher net replacement rates and lower employment protection legislation might go in tandem with lower unemployment rates in OECD countries.

**Figure 6. The combination of ALMP, EPL and generous contributions and unemployment rate in OECD countries**



Source: Authors' calculations using data obtained from the OECD

Note: Vertical axis of the left panel shows an indicator, which is the product of public expenditures on ALMPs as a share of GDP and the long-term net replacement rate of unemployed persons, both measures averages of the period 2000 to 2008. Vertical axis of the right panel is augmented by the effect of the inverted employment protection legislation indicator (EPL). EPL ranges from 1 (least restrictive) to 4 (most restrictive). Hence, a low EPL would increase the overall value of the product of the three sub-indicators, while a high EPL would lower it. The unemployment rate is the period average for 2000-08.

The experience of OECD countries suggests that Estonia could improve the effectiveness of its ALMPs at a given level of expenditures by linking increases in unemployment benefits to participation in ALMP programmes and monitoring performance of the employment offices. Increases of unemployment benefits and their duration should be conditional on work availability and active job search and/or participation in job creating or training programmes (OECD, 2006). To raise ALMP's effectiveness, efficiency of employment services could also increase. Regarding benefit conditionality, Estonia could introduce practices of some of the OECD members:

- Required frequency of reporting of search activities could be raised from monthly to every two weeks, as is done, for example, in Australia, the Czech Republic, United Kingdom, and the United States. Personal visits seem most effective (OECD, 2007).
- Increases in benefit entitlements should be conditional on participation in ALMPs programmes, such as job creation (entrepreneurship) or training. Similar links have been established in Australia (Mutual obligation strategy); the UK (New Deal strategy) and other European countries (Grubb, Singh and Tergeist, 2009).

#### 4.2. *Minimum wage, tax wedge and unemployment*

A prevailing view in the economic profession is that a high tax wedge could lead to an insufficient creation of firms and jobs, and constitutes a particularly strong impediment for SMEs. Panel A of Figure 7 shows that a higher tax wedge goes hand in hand with higher unemployment rates in OECD countries. In the case of Estonia, surveys conducted by the Estonian Research Institute indicate that high taxes on labour are the main reason for undeclared work (Leetmaa and Vork, 2007). Against this backdrop, one of the proposals of the employers' representatives is to shift the burden of taxation from employers towards workers, by splitting the contribution between these two parties (Employers' Manifesto for 2007 – 2011).

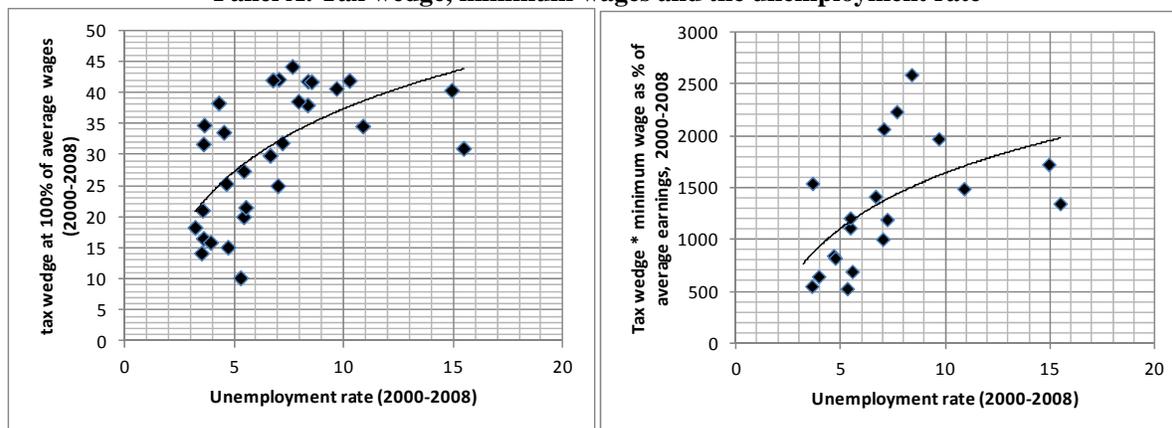
High tax wedges are particularly detrimental to employment in countries with high minimum wages, because the tax burden cannot be passed on to workers (Bassanini and Duval, 2006). In fact, data shown in Panel A of Figure 7 that a higher tax wedge is associated with a higher unemployment rate in OECD

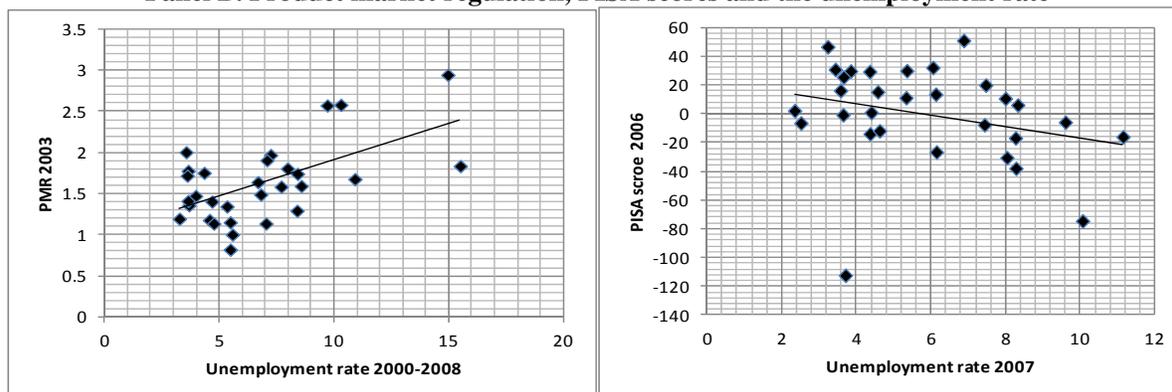
countries over the period 2000 to 2008. In addition, a positive correlation exists between the product of the tax wedge and the minimum wage (as a share of average earnings), on the one hand, and the unemployment rate, on the other, implying that a higher tax wedge coupled with a higher minimum wage is linked to a higher unemployment rate in OECD countries.

In the Estonian context this provides additional reasons (besides macroeconomic and inflationary considerations) why minimum wage increases should be kept in line with productivity growth and at a level which does not reduce employment options of low-productivity workers. Estonia could include an independent committee of outside experts in negotiations, also to bring the macroeconomic perspective, as was done, for example, in Ireland, the United Kingdom, and Australia. In addition, the employers' social security contribution should be reduced, especially given the high tax wedge on low-income workers, as was recently done, for example in the Czech Republic in the context of the economic crisis.

More general policies may also influence labour market outcomes. A business-friendly environment that promotes the creation of firms and allows for more flexibility in adjusting to shocks is likely to reduce the unemployment rate. Panel B of Figure 7 shows a positive correlation between product market regulations (PMR) and unemployment rate in OECD countries: a lower degree of regulation is associated with a lower unemployment rate. A better educated labour force is also essential to reduce frictions in matching job offers with job seekers. An increased ability to learn and think independently at the age of 15, captured by the PISA scores, tends to be associated with lower unemployment rates in OECD countries (Panel B of Figure 2). More broadly, and as shown in the above model, adult learning, in particular well targeted training programmes to close skill gaps in selected areas, can also help align workers' skills with demands of the labour market.

**Figure 7. Policies and the unemployment rate in OECD countries**  
**Panel A. Tax wedge, minimum wages and the unemployment rate**



**Panel B. Product market regulation, PISA scores and the unemployment rate**

Source: authors' calculations using data obtained from the OECD

Note: Vertical axis of the left panel of Panel A shows the tax wedge at 100% of average wages for 2000-08. The right panel of panel A shows an indicator which is calculated at the tax wedge multiplied by the minimum wage as a share of average earnings over the period 2000-08. Vertical axis of panel B depicts the 2003 vintage of product market regulation (PMR) and the 2006 PISA scores. The unemployment rate is the period average for 2000-08.

## Conclusions

Following years of steady decline during 2001-2007, the unemployment rate in Estonia increased dramatically from 4.1 percent in December 2007 to 19.8 percent in June 2010 after the country entered a severe recession in 2008. While the rate was already down to 13.3 percent in September 2011, it remains high, especially among the less educated segments of the population. In this paper we examined labour market institutions and policies that may help Estonia reach better longer term labour market outcomes become.

While the Estonian labour market had been already flexible in many ways, the Employment Protection Legislation adopted in 2009 removed some of the remaining rigidities that hampered hiring of new workers, especially first entrants to the job market. It also eased transition from less to more productive activities, which is consistent with Estonia's objective to become a knowledge-based economy. The Estonian labour markets would also benefit from reduction of high tax wedge on wages as well as from keeping increases of the minimum wage in line with changes in labour productivity.

Results of a simulated search-matching model suggest that Estonia could adopt several measures to increase flexibility of its labour market and thus ease the recovery and improve medium term outcomes. These measures include strengthening incentives of the unemployed workers to search for jobs or participate in training and job search programmes and incentives for firms to create job creation such as: (1) implementing fully the reduced lay-off notice periods and severance payments, as stipulated in the Employment Contract Act; (2) making increases in unemployment benefits conditional on active job search and retraining; and (3) reducing the tax wedge by cutting social security contributions of employers, especially on low-wage workers. The Estonian labour market would also benefit from improving employment incentives for low wage workers, such as reducing social security contributions of employers on low wage workers, as adopted, for example, in the Czech Republic as part of the anti-crisis package.

While not addressed in this paper, the experience of other countries shows that adequate social protection mechanisms would also improve longer term labour outcomes by allowing the unemployed to search for appropriate jobs or retrain for new jobs arising from structural changes in the economy. We leave this important topic for further research.

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# **Labour Market Reforms in Portugal 2011-2015**

## **A PRELIMINARY ASSESSMENT**

## FOREWORD

This report, commissioned by the XIX Government of Portugal, provides an evaluation of the comprehensive labour market reforms undertaken in Portugal over the period 2011-2015. It describes reforms in the areas of employment protection legislation, unemployment benefits, activation, collective bargaining, minimum wages and working time. The report reviews the reforms in detail and assesses the available evidence on the impact they have had on the labour market.

Assessing the impact of these reforms on the labour market is not an easy task, not least because they were introduced in a relatively short period of time and together with other reforms outside the labour market. They also coincided with a second dip in GDP growth and a gradual recovery. Disentangling the effects of the labour market reforms from these contemporaneous events is not straightforward. In addition, many of the effects of the reforms will become fully evident only in the medium- to long-run.

The present report should therefore be seen as a preliminary assessment of those reforms. That being said, it is possible, even at this stage, to make some observations about key policy priorities for the future – and the report offers some recommendations to that effect. While further reforms of labour market institutions, policies and practices will be required, achieving higher levels of employment and greater inclusiveness in Portugal will also depend on factors that lie outside the realm of labour market policy – not least on a return to higher and more sustainable levels of growth.

The report was prepared by Stijn Broecke and Marieke Vandeweyer (both from the Employment Analysis and Policy Division – EAP – in the OECD Directorate for Employment, Labour and Social Affairs – ELS). Sofia Pessoa e Costa (Queen Mary, University of London) worked as a consultant on the project, and Andrea Bassanini (ELS/EAP) provided technical and expert advice throughout.

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## EXECUTIVE SUMMARY

Portugal was badly hit by the global financial crisis and suffered unprecedented job losses. Total employment fell by 767 000 (-15%) between mid-2008 and the beginning of 2013 and, at its peak, the unemployment rate stood at 17.3% (up from 8.6% at the beginning of 2008). The crisis added to Portugal's labour market problems. Unemployment had been rising even before the crisis (from 5.1% in 2000), its labour market was highly segmented, and the long-term unemployment rate was among the highest observed in the OECD. In order to deal with these deep-rooted structural weaknesses, a comprehensive set of labour market reforms was implemented over the period 2011 to 2015. More specifically:

- Portugal significantly reduced severance pay and eased the definition of fair dismissals as part of one of the most substantial reforms of *employment protection legislation* (EPL) among OECD countries in recent years, bringing the strictness of the country's regulations closer in line to the EU average. There is some early indication that these reforms have incentivised on-the-job search (a lead indicator of job-to-job flows) as well as hiring. While the reforms have narrowed the regulatory gap between permanent and temporary contracts (and appear to have encouraged hiring on permanent contracts), this gap remains important and continues to contribute to labour market duality.
- Against a backdrop of rising unemployment and EPL reforms which made it less costly for employers to dismiss workers, Portugal widened the safety net provided by *unemployment benefits*. At the same time, the maximum duration of these benefits was reduced in an attempt to reduce long-term unemployment, although the full impact of this reform will take time to materialise because the new rule only applies from the second unemployment spell after the reform. These changes have brought the Portuguese unemployment benefit system more in line with standard practice across the OECD, but coverage remains relatively low and maximum benefit duration high.
- To help the unemployed back into work Portugal strengthened its *activation framework*. While eligibility criteria for unemployment benefits have always been strict on paper, recent measures tightened the way these criteria are implemented in practice – and there is some evidence that this has increased exits from unemployment. Portugal has also significantly increased its offer of short-term training programmes and hiring subsidies for the unemployed, set up a Youth Guarantee, and put in place a comprehensive strategy to modernise the Public Employment Service (although some measures included in this strategy have yet to be implemented).
- Reforms of the *collective bargaining* system aimed to promote a closer alignment between wages and productivity at the level of the firm by: introducing representativeness criteria for the extension of collective agreements; allowing firm-level agreements to be negotiated by works councils in firms with at least 150 employees (500 prior to the reform); and introducing a possibility for employers to temporarily suspend a collective agreement during times of crisis. While some of the initial reforms and measures (which have since been reversed) may have contributed to a reduction in collective bargaining coverage, the decline in the number of sector agreements was also crisis-induced and is, in fact, part of a longer-term trend which started in the mid-1990s. More generally, it is unlikely that the recent reforms will have much impact given that the current representativeness criteria for extensions are easily fulfilled; worker representation at the firm-level is weak; and the conditions for opting out of sector agreements remain vague and therefore open to conflict.

- In face of the crisis, the Portuguese Government also attempted to achieve *wage moderation* by freezing the national minimum wage between 2011 and 2014; reducing compensation for overtime work; and cutting public sector pay. Although low in absolute terms, the minimum wage in Portugal remains quite high compared with other OECD countries when expressed as a proportion of median wages. Moreover, employers also face a high rate of taxes and social security contributions on minimum wage workers (23.75% versus 19% across the OECD on average). Both of these factors raise some concern about a possible negative impact of future increases in the minimum wage on the employment of low-wage workers.
- Finally, as in a number of other European countries, firms facing economic difficulties were granted additional flexibility towards the middle of 2012 to adjust *working time* instead of employment. This is a welcome development given that the adjustment in labour input to the crisis in Portugal had primarily occurred through job destruction, in contrast to what had happened in some other OECD countries. That being said, the use of flexible working-time practices is likely to remain low in Portugal as long as there is a high share of temporary employment, which makes it easier for firms to adjust labour inputs along the extensive employment margin.

The Portuguese labour market reforms were a move in the right direction. Since economic growth turned positive again in early 2013, Portugal has experienced significant improvements in both employment and unemployment rates – greater, in fact, than what one would have expected given the pace of the recovery. However, despite the progress made, many challenges remain. Unemployment remains high (particularly among youth) and this situation has fuelled an increase in both poverty and long-term unemployment (although there are signs of improvement in the latter). The labour market remains highly segmented and, in the context of very low inflation, the presence of downward nominal wage rigidity is likely to remain a barrier to the competitiveness of the Portuguese economy – unless productivity growth is strengthened.

In view of these remaining challenges in the labour market, tackling segmentation should be a key priority for the Portuguese Government, and this can be partly achieved by further reducing the regulatory gap between permanent and temporary contracts. At the same time, the safety net for those out of work needs to be strengthened by a further widening in the coverage of unemployment benefits, but the maximum duration of these benefits could be reduced further in a bid to tackle long-term unemployment. But, to be effective, employment programmes to support the reintegration of jobseekers into employment should also be strengthened.

Competitiveness needs to be improved by aligning collective bargaining processes more closely with firm performance. In particular, the potential for negative effects of administrative extensions of collective agreements on non-signatory firms should be minimised, and the procedures for firms facing economic hardship to opt out of such agreements should be clarified. Finally, further increases in the minimum wage might help address in-work poverty but, to minimise any potential job losses, reductions in employers' social security contributions on minimum-wage workers should be considered.

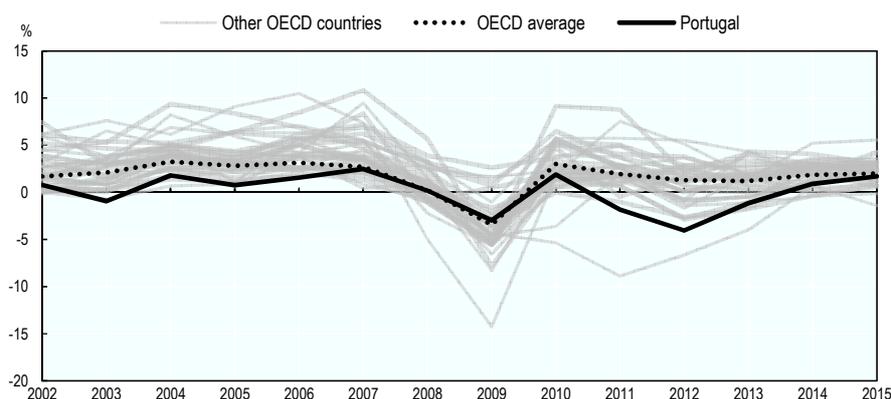
More generally, further improvements to Portugal's job market performance will require tackling other economic challenges. These include: the need to return to higher and more sustainable levels of growth; further reforms of product market regulations; better access to credit for firms; a reduction in employers' non-wage labour costs; and additional investments in skills.

## ASSESSMENT AND RECOMMENDATIONS

The global economic and financial crisis triggered a severe recession in Portugal, leading to a significant increase in unemployment. Between mid-2008 and the beginning of 2013, an estimated 767 000 individuals (or one in seven workers) lost their job. At its peak (Q1 of 2013), the unemployment rate in Portugal stood at a record high of 17.3% – more than twice the OECD unemployment rate at that time.

However, economic and labour market performance was poor in Portugal even before the crisis hit, and the recession painfully exposed pre-existing weaknesses and imbalances. Over the period 2002 to 2008, annual real GDP growth in Portugal was consistently among the lowest in the OECD area: less than 1%, compared to 2.3% across the OECD on average (Figure 1) and the unemployment rate increased from 5.0% in 2002 to 7.6% in 2008. Since the mid-1990s, unit labour costs had been rising faster than in core European countries, eroding competitiveness (OECD, 2010a), and external and public deficits were persistently high (Portugal, 2015).

Figure 1. Annual real GDP growth rate, Portugal and OECD, 2002-2015



Source: OECD Economic Outlook No. 98, November 2015.

When the crisis hit, the public deficit ballooned as high public spending (partly driven by countercyclical measures) coincided with a fall in public revenue. Investors and creditors became nervous about Portugal's ability to rein in its budget deficit and debt, and access to international financial markets became increasingly difficult. As a result, Portugal faced growing difficulties in meeting international payment obligations and, in April 2011, ended up requesting financial assistance from the European Union, the European Central Bank and the IMF (the "Troika") to solve its sovereign debt crisis. A financial assistance programme, amounting to EUR 78 billion over a period of three years, was agreed in May 2011. The programme was made conditional on a set of fiscal consolidation measures and structural reforms, which were described in detail in the Memorandum of Understanding signed between Portugal and the three institutions.<sup>1</sup> These reforms focused on the following key objectives: i) budgetary

1. Many of the reform proposals included in the MoU had already been included in a tripartite agreement that preceded Portugal's request for assistance (*Acordo Tripartido para a Competitividade e Emprego* signed on 22 March 2011- although the MoU went beyond the measures included in this document) and had been the subject of an earlier white paper (*Livro Branco das Relações Laborais*). In addition, Portugal had already been implementing important labour market reforms since 2003 (Távora and González, 2015).

consolidation; ii) financial sector stabilisation; and iii) structural reforms to boost growth and competitiveness.

Among the structural reforms to boost growth and competitiveness in Portugal, the Troika gave high priority to reforms of labour market institutions and policies, including: unemployment benefits; employment protection legislation; working time arrangements; wage-setting mechanisms; and active labour market programmes. Among the key challenges to be addressed were:

- *A highly segmented labour market.* Portugal had very rigid employment protection legislation on open-ended contracts, making it an outlier on the OECD's EPL indicator. The difficulty of making workforce adjustments through permanent contracts, a high degree of (nominal) wage rigidity, and the relative ease of use of temporary contracts, led to a share of temporary employment which was one of the highest in the OECD area (affecting one in five Portuguese workers in dependent employment, and young workers in particular).
- *One of the highest long-term unemployment rates in the OECD.* Even prior to the crisis, nearly one in two unemployed individuals in Portugal had been out of a job for more than a year (compared to just one in eight in OECD countries on average). This was partly driven by deep structural changes resulting from globalisation and technological change, which have led to a large number of displaced workers with poor skills facing significant barriers in finding new jobs. However, Portugal's generous unemployment benefit system (for those eligible) and a weak activation framework were also partly to blame. At the same time, the coverage of the unemployment benefit system was relatively low.
- *A high level of (nominal) downward wage rigidity.* Portugal's collective bargaining system and legal restrictions around nominal wage cuts resulted in significant downward wage rigidities. Consequently, during a period of low inflation (like the recent crisis), employers have very little leeway to adjust real wages, which leaves employment (and temporary employment in particular) as the main margin of adjustment. This partly explains the surge in unemployment Portugal experienced during the crisis (Carneiro, Portugal and Varejão, 2014).

In January 2012, the government signed the “Growth, Competitiveness and Employment Pact” (*Compromisso para o Crescimento, Competitividade e Emprego*) with the social partners.<sup>2</sup> The set of measures outlined in the pact corresponded closely to the reforms that were eventually implemented, and also gave them their legitimacy. The reforms (discussed in Chapter 1 and in more detail in Annex A) were implemented over several years (see timeline in Annex B), and with some difficulties. Some reforms were strongly opposed by the social partners (and therefore never implemented).<sup>3</sup> Others were implemented, but subsequently revoked by the Constitutional Court since they were considered unconstitutional.

Despite the long and tortuous path, a lot has been achieved by Portugal over this period: within the context of the Memorandum of Understanding alone (but including reforms in areas outside the labour market), over 450 measures were implemented – equivalent to around three measures per week (Government of Portugal, 2014). As the timeline in Annex B testifies, labour market reforms over the period were implemented almost on a monthly basis. While additional reforms are undoubtedly necessary, it is important to also take stock of what has been achieved to date, and assess how well the measures implemented have succeeded in meeting their intended objectives. In this spirit, the government committed

2. Although one of the union federations (the General Confederation of Portuguese Workers – *Confederação Geral dos Trabalhadores Portugueses* – CGTP) refused to sign it.

3. These include the proposal to increase the daily maximum working time by half an hour, as well as the proposal to increase the compulsory social security contributions of workers (public and private sector) from 11% to 18%, and to decrease employers' contributions from 23.75% to 18%.

to monitoring carefully its labour market reforms to assess if they are having the intended impact and fine-tune accordingly (Government of Portugal, 2014).

The present report, commissioned by the Government of Portugal, is one contribution to this process of monitoring and evaluation. It focuses primarily on the labour market reforms carried out during the period 2011 through to the first semester of 2015. Chapter 1 describes these reforms in some detail, the rationale behind them, their expected outcomes, as well as the available evidence on the actual impact they have had on the labour market. Chapter 2 then assesses the performance of the Portuguese labour market over the past few years, and the final chapter discusses areas where further reforms/fine-tuning may be necessary.

The main findings and recommendations of the report are as follows:

### **Employment protection legislation**

- Prior to the reforms, Portugal was a significant outlier among OECD countries in terms of the strictness of its employment protection legislation (EPL) for individual workers on permanent contracts, driven primarily by: demanding procedural requirements for employers initiating a dismissal process; high severance payments; and the strong likelihood of reinstatement in cases of unfair dismissal. At the same time, a large regulatory gap existed between permanent and temporary contracts, contributing to the high degree of segmentation in the labour market.
- As part of the reforms, Portugal significantly reduced the amount of entitlements to severance pay for new hires (while largely preserving the accumulated rights of existing workers). The reduction was particularly large for permanent contracts, and, for the same job tenure, severance pay for dismissals on permanent contracts is now lower than it is on temporary contracts. Portugal also attempted to ease the definition of fair dismissal through the introduction of a new reason for dismissal (inadaptability without change to the nature of the job) and the introduction of more objective (performance-related) criteria for dismissing workers in the case of extinction of a work position. However, these latter reforms were only a mixed success as important aspects of them were ruled unconstitutional.
- The Portuguese EPL reforms rank among the most substantial of those implemented by OECD countries in recent years. Preliminary analysis carried out for the purpose of this report suggests that the reductions in severance pay may already have had a positive impact on on-the-job search (a lead indicator of job-to-job flows), as well as on hiring and the share of hiring that is on permanent contracts. At the same time, the preservation of accumulated severance pay entitlements appears to have protected existing workers from an increased risk of dismissal as a result of the reforms. In the long run, the cuts in severance pay are expected to result in significant gains in both productivity and growth. It will be important to build on the positive impact of these reforms on Portugal's labour market performance, and a number of areas remain where these reforms could be bolstered.
- While Portugal's reforms have moved the stringency of its EPL closer to the OECD average, the regulatory gap between permanent and temporary contracts remains significant, and this continues to contribute to labour market segmentation.
- Reducing further the disincentives to hire workers on a permanent contract could be achieved by clarifying the conditions under which employers can dismiss individual workers for economic reasons – similar to the reforms that have recently been undertaken in both France and Spain.<sup>4</sup> This is likely to require a change to the Constitution (Article 53 which prohibits dismissals without “just cause”, but without defining what the latter means) and may be difficult to achieve in practice. Even in the absence of a constitutional change, however, further reductions in employment

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4. OECD (2013b, 2013c).

protection for workers on permanent contracts can and should be achieved by: reducing the compensation following unfair dismissal and reducing the possibilities for reinstatement.

- Another option to reduce labour market duality would be to make hiring on temporary contracts relatively more expensive, for instance by charging higher social security contributions (as was done in Slovenia, France and Italy). However, while this would help reduce segmentation, there is a risk that higher labour costs would reduce employment opportunities, particularly for the marginal worker. This may be particularly problematic in sectors with a large share of seasonal workers (like tourism and agriculture).
- The reforms also introduced changes to the way severance payments are to be made. Two dismissal funds collecting regular contributions from employers were set up which are intended to: i) cover part of the severance pay in case a worker is dismissed; and ii) guarantee a minimum amount of severance pay for the employee in case the employer cannot pay. While this new system reduces the up-front cost of dismissal to the employer and offers some insurance to the employee, it does not solve the problem that high accumulated severance pay rights act as a disincentive to mobility for the workers concerned.
- Another aspect of labour market segmentation in Portugal is the high incidence of dependent (or “false”) self-employment, which puts many workers in a very vulnerable position *vis-à-vis* their employer. While Portuguese labour law already defined the conditions under which an employment contract would be presumed, the recent reforms gave labour inspectors (*Autoridade para as Condições do Trabalho* – ACT) additional tools for enforcing the law and regularising contracts in the case of non-compliance. At the same time, however, there are indications that there is a lack of resources for effective implementation of these new provisions.

#### **OECD recommendations: Employment protection legislation**

1. Clarify the conditions under which employers can dismiss individual workers on permanent contracts for economic reasons, following the recent examples of both France and Spain.
2. The above recommendation may be difficult to implement because it requires an amendment of Article 53 of the Constitution. Nevertheless, even without such a change, further reductions in employment protection legislation for workers on permanent contracts can still be achieved by:
  - Reducing compensation following unfair dismissal; and
  - Limiting the possibility of reinstatement in the case of unfair dismissal. A reduction in the risk of litigation and reinstatement for employers could be achieved by making the receipt of (ordinary) severance pay conditional on individuals renouncing their right to litigation – similar to current practice in Germany.
3. Labour market duality could also be reduced by raising the relative cost of hiring on temporary contracts (e.g. by charging higher social security contributions) – however this may come at the expense of employment, which would affect marginal workers in particular. Therefore, one may wish to waive these higher social security contributions when firms hire marginal workers (e.g. low-skilled, youth and the long-term unemployed).
4. Disincentives to worker mobility could be reduced by making severance pay funds portable from one employer to another (as in Austria) – although the costs of moving to such a system should be carefully weighed against the benefits.
5. Strengthen the capacity of the labour inspectorate (ACT) to further clamp down on “false” self-employment (i.e. self-employed workers who are economically dependent on a single employer).

## Unemployment benefits

- Prior to the recent reforms, Portugal had a relatively generous unemployment benefit system for those eligible compared to other OECD countries, which is likely to have contributed to a high rate of long-term unemployment. To address this issue, Portugal lowered the cap on the maximum benefit amount and introduced a declining replacement rate to incentivise a more rapid return to work. In addition, the maximum duration of unemployment benefits was shortened – although this would only apply from the second unemployment spell onwards, so that an element of protection was kept in place during the recent episode of high unemployment. This also means that the impact of this latter reform on long-term unemployment will take time to materialise and that, unfortunately, its impact cannot yet be assessed. At the same time, preliminary evidence on the impact of the reductions in benefit levels suggests that they may have increased exits from unemployment – although the estimates are statistically insignificant. These reforms have moved Portugal closer to the OECD average in terms of the generosity of unemployment benefits and, to the extent that international evidence and past experience in Portugal provide useful insights, they should eventually help shorten unemployment spells and reduce the level of long-term unemployment. That said, the average maximum duration of unemployment benefits remains relatively high in Portugal compared with the OECD average.
- With unemployment soaring and EPL reform making it easier and less costly for employers to dismiss workers, there was also a need to widen the safety net provided by unemployment benefits. By international standards, the coverage rate of unemployment benefits (measured as the ratio of beneficiaries to the number of LFS unemployed) is relatively low in Portugal. Therefore, Portugal relaxed the contribution requirements for gaining access to unemployment insurance. The evidence suggests that, despite a significant increase in unemployment between 2011 and 2013 (and, in particular, an increase in long-term unemployment and the number of individuals with shorter contribution histories), the coverage rate of unemployment benefits held up well – but it remains at a low level. Of particular concern is the coverage of youth and others with short or incomplete contribution records (including those on non-regular employment contracts). In addition, the reduction in generosity of the *Rendimento Social de Inserção* (RSI) – a means-tested benefit of last resort – resulted in an important decline in the number of beneficiaries, causing significant hardship among the poor.

### OECD recommendations: Unemployment benefits and social assistance

6. Provide greater protection for the unemployed by widening further the coverage of unemployment benefits. One option would be to raise the means test threshold for unemployment assistance and uprate it annually in line with inflation.
7. At the same time, further reduce the maximum duration of unemployment benefits to strengthen incentives for job search and tackle the high incidence of long-term unemployment – particularly for older workers. This should include restricting the possibility of extending unemployment assistance until the age of retirement to only those older people who remain unemployed despite taking active steps to find work. However, these reforms should be combined with measures to reinforce employment programmes to support the reintegration of jobseekers into employment (see below).

## Activation

- Moving individuals from unemployment into jobs also requires an effective activation framework to connect people with jobs. This includes the incentives to find work contained in the unemployment benefit system, but also other determinants of motivation, measures to promote employability, as well as policies to increase the number of opportunities available to jobseekers.

- Over the period 2011-2015, Portugal took several steps to strengthen its activation framework. While eligibility criteria for unemployment benefits (i.e. the criteria determining ongoing eligibility which require recipients to actively look for work, take up suitable job offers or take part in active labour market programmes) have always been strict on paper, recent measures have tightened the way these criteria are implemented in practice, with some proven success in terms of exits from unemployment.
- Portugal has also significantly ramped up its offer of short-term training and hiring subsidies for the unemployed, which international evidence suggests can be particularly effective for the long-term unemployed at times of crisis. However, the coverage of these programmes has broadened over time and there may now be a need to re-focus some of these measures (including those covered under the Youth Guarantee) on those who need them most (i.e. disadvantaged youth and the long-term unemployed). In addition, there have been numerous and frequent changes in these programmes in recent years, which may make it difficult for jobseekers and employers to know exactly what help is available to them. While new analysis contained in this report suggests that hiring subsidies and subsidised internships may be particularly helpful to assist the unemployed back into work, there is generally very little evaluation of the effectiveness of active labour market programmes in Portugal.
- There has also been a concern that some of the active labour market programmes, by encouraging hiring on temporary contracts, have not led to sustainable job creation. One option forward would be to build stronger incentives to hire on permanent contracts into active labour market programmes. For example, some OECD countries train the unemployed to fill existing vacancies and, in return, expect the employer to hire the individual on a permanent contract (e.g. Individual Job Training in Flanders, Belgium and Work and Income Support in New Zealand). The risk, however, is that this would reduce the overall take-up of such programmes. In addition, many of Portugal's existing active labour market programmes already offer larger subsidies to employers if they hire on permanent contracts – but there is no evidence as to whether these measures are actually effective or not.
- Finally, a comprehensive strategy has been defined to strengthen the Public Employment Service, which is a critical driver of the success of any activation programme. However, not all measures included in this strategy have yet been implemented and, going forward, it will be essential that they are.

#### OECD recommendations: Activation

8. Ensure that more costly active labour market programmes (ALMPs) are more closely targeted on those who need them most (i.e. disadvantaged youth and the long-term unemployed) and that programmes are well-tailored to the specific needs of jobseekers.
9. Consider building stronger incentives to hire on permanent contracts into active labour market programmes, but ensure that take-up by employers is not reduced unduly as a result and evaluate existing measures that incentivise hiring on permanent contracts.
10. Aim for more stability in the ALMP measures on offer to ensure jobseekers and firms have a better understanding of what help is available to them.
11. Devote more resources to the careful monitoring and evaluation of ALMPs. In particular, all new programmes should be trialed on a random, pilot basis.
12. Fully implement the measures outlined in the programme to modernise the Public Employment Service (*Programa de Relançamento do Serviço Público de Emprego*).

## Collective bargaining

- The issue of representativeness in Portugal's *collective bargaining* system remained unresolved despite important pre-crisis reforms. In particular, the combination of low coverage rates of both employer organisations and trade unions, on the one hand, and the practice of quasi-automatic extensions of collective agreements, on the other, led to the imposition of a large number of sector/occupation wage floors which did not necessarily represent the economic realities of non-signatory firms (and even less so the views of potential start-ups and the unemployed more generally). Moreover, firms are legally prohibited from reducing base wages (unless this is permitted by collective agreement) and rules around the validity of collective bargaining agreements meant that, in some cases, it was extremely difficult for employers to re-negotiate an agreement with unions. The consequence was a high level of downward nominal wage rigidity in the labour market. This can be particularly harmful at times of crisis with low inflation: if firms cannot adapt to worsening economic conditions by lowering (real) wages, the only other adjustment channel left for firms is to reduce employment (short of shutting down altogether). To make matters worse, when collective agreements were extended, the corresponding wage clauses often applied retrospectively, forcing employers affected to pay the resulting wage arrears. This tended to exacerbate the potential negative effects of administrative extensions on competitiveness and employment.
- A significant number of reforms were implemented during the crisis, all aimed at making the collective bargaining system more representative, decentralised and dynamic. Extensions of collective agreements were temporarily frozen in May 2011, and, from November 2012 onwards, they were only granted if the collective agreement met certain criteria in terms of the representativeness of the employers that signed up to it. These measures helped achieve some wage moderation during the crisis (and therefore saved jobs) – but the issue of representativeness has not yet been fully resolved. In particular, while the first condition introduced (requiring signatory employers to represent 50% of workers in the relevant sector/occupation/geographical area) was restrictive, a second, alternative condition added later (which also allows extension when 30% of signatory firms are small or medium enterprises) is very easy to fulfil given that 99.7% of firms in Portugal are SMEs.
- As part of the package of reforms, Portugal also allowed firm-level agreements to be negotiated by works councils in firms with at least 150 employees (previously this threshold was set at 500 employees) – but the lack of worker representation in smaller firms raises questions about how much difference this will make in practice. Portugal also took steps to encourage more frequent and swifter re-negotiations of collective agreements by placing additional constraints on the time for which they remain valid. Finally, a possibility was introduced for employers to temporarily suspend a collective agreement (or certain terms contained in it) at times of crisis. While (for obvious reasons) this can only occur upon agreement with the relevant unions, it is also likely to reduce the effectiveness of the measure unless: i) the conditions under which firms may opt out are further clarified (as was done in Spain); and ii) clear and swift procedures for resolving inevitable conflicts are established.
- The crisis period and the implementation of a large number of reform and austerity measures have put significant strain on the relationships between the social partners, and trust in social partners in Portugal is lower than in the OECD on average. Given the growing evidence that trust between social partners may be almost as important a determinant of collective bargaining outcomes as the collective bargaining institutions themselves, it is of critical importance that this trust be strengthened.

### OECD recommendations: Collective bargaining

13. Limit the negative consequences of administrative extensions of collective agreements by:
  - Making the representativeness criteria that regulate the extension of collective agreements more challenging (which would encourage employers to organise), while keeping them realistic (i.e. not impossible to meet).
  - Granting administrative extensions only if they are in the “public interest”, i.e. if they meet clearly defined criteria by the government which are announced well in advance and known by the social partners before they enter into negotiations. In other words, such public interest conditions would set the parameters within which collective bargaining would be expected to take place.
  - Alternatively, making the extension of collective agreements conditional on the inclusion of opening clauses which clearly specify the issues (including wages and working conditions) that can be delegated to the individual firm, and under what conditions.
  - Setting up an independent body responsible for deciding (or advising the government on) whether extensions should be granted – similar to those currently operating in Finland and Germany. This body could consist of representatives from unions, employers, as well as independent experts.
14. Make it easier for firms to opt out of collective agreements at times of crisis by:
  - Clarifying the conditions under which firms can opt out due to “inability to pay” or hardship. In Spain, for example, sectoral agreements have to include objective conditions (such as a fall in sales or productivity over a specified period of time) that specify when firms may opt out of what was agreed.
  - Introducing a swift arbitration process in case of disagreement between employers and worker representatives. Again, this could be modelled on the system in Spain where, following disagreement, employers can unilaterally refer the issue to arbitration with no right for either party to appeal against the decision.
15. Making it easier for firms to opt out should go hand in hand with measures to strengthen worker representation at the firm-level, for example by making works councils compulsory for firms of a certain size (like in France) or providing financial incentives for firm-level bargaining (Italy).
16. Enshrine in legislation the current practice whereby the retroactive effects of collective bargaining agreements which have been extended are limited to the first day of the month in which the extension occurs.
17. Build more trust between the social partners. While building trust is a complex process, it can be partly achieved by implementing some of the above recommendations, including: making unions and employer organisations more inclusive; promoting worker representation at the firm level; introducing objective criteria for both extensions and opt-outs; and encouraging regular negotiations (e.g. by reducing the maximum length of time for which agreements can remain valid).

## Wages

- Additional wage moderation was achieved by freezing the national minimum wage between 2011 and 2014; significantly reducing pay (and other compensation) for overtime work; and cutting public sector wages. The freezing of the minimum wage led to a slow erosion of its real value over the period 2011-2014 and hurt low-wage workers. OECD estimates for 2013 show that, in comparison with other OECD countries, minimum-wage workers in Portugal had to work a high number of hours to earn enough to move above the relative poverty line (50% of median income). At the same time, however, minimum wages are closer to the median wage in Portugal than in most other OECD countries. In addition, the rate of employer taxes and social security contributions for minimum-wage workers is higher than in most other OECD countries. Both these factors raise concerns about the possible dis-employment effects among unskilled workers

of the intended increase of the minimum wage to EUR 600 by 2019. While employers currently benefit from some reduction in social security contributions on minimum-wage workers, these are available for existing employees only.

#### OECD recommendations: Minimum wage

18. Reduce employer social security contributions on all minimum-wage workers, including new hires, to soften the impact of planned increases in the minimum wage on labour demand.
19. Set up an independent commission comprised of experts and representatives of the social partners to provide the government with impartial information and advice on future changes to the minimum wage, carefully considering current and future labour market conditions.

### Working time

- Firms in Portugal were given additional flexibility to respond to changes in demand by adjusting working time instead of employment. This is a welcome development, given that: i) in contrast to what happened in some other OECD countries, the adjustment in labour input to the crisis in Portugal occurred primarily through job destruction; and ii) there is evidence that short-time work compensation schemes and working time accounts have helped preserve jobs in a number of OECD countries during the crisis (OECD, 2010b). More specifically, the reforms reduced the procedural requirements and time needed to implement short-time work arrangements, and individual working time accounts were introduced alongside the collective working time accounts already in place. Portugal also improved the design of short-time work compensation schemes to reduce their deadweight loss.
- These changes have increased the use of flexible time practices in Portugal. However, given that the reforms were introduced relatively late during the crisis (mid-2012), they are unlikely to have done much to prevent job losses during the recession. In addition, their use remains relatively low in comparison with other countries, and this is likely to remain so as long as there is a high share of temporary employment which makes it easier for firms to adjust labour inputs along the employment margin. Finally, the risk that short-time compensation schemes preserve inefficient job matches and prevent the reallocation of labour to more productive uses increases if they are not phased out as the recovery sets in.

#### OECD recommendations: Working time

20. Phase out (or reduce the generosity of) short-time work compensation schemes as the recovery takes hold to prevent such schemes from becoming an obstacle to the recovery.

### The road ahead

While the reforms outlined above were a step in the right direction in terms of building a more resilient and inclusive labour market and appear to have had the intended effect, assessing their joint impact on the labour market is much more difficult because of the large number of reforms that were undertaken (including many outside the labour market) over a relatively long period of time. In addition, little time has elapsed since the reforms were implemented and, in many cases, results will only become visible in the medium- to long-run. At the same time, the reforms coincided with a second dip in GDP growth and a gradual recovery. Disentangling the effects of the reforms from those of the economic cycle is notoriously difficult. That being said, the report finds that the fall in unemployment since Portugal started recovering from the recession

(Figure 2, Panel A) is much larger than one would have expected based on the past relationship between economic growth and unemployment (see Chapter 2 for more detail). While this cannot be interpreted as causal evidence, the finding is nevertheless consistent with the impact that would be expected from the reform package as well as the demonstrated effects that some individual measures have had so far on exits from unemployment, on-the-job search and hiring, amongst others.

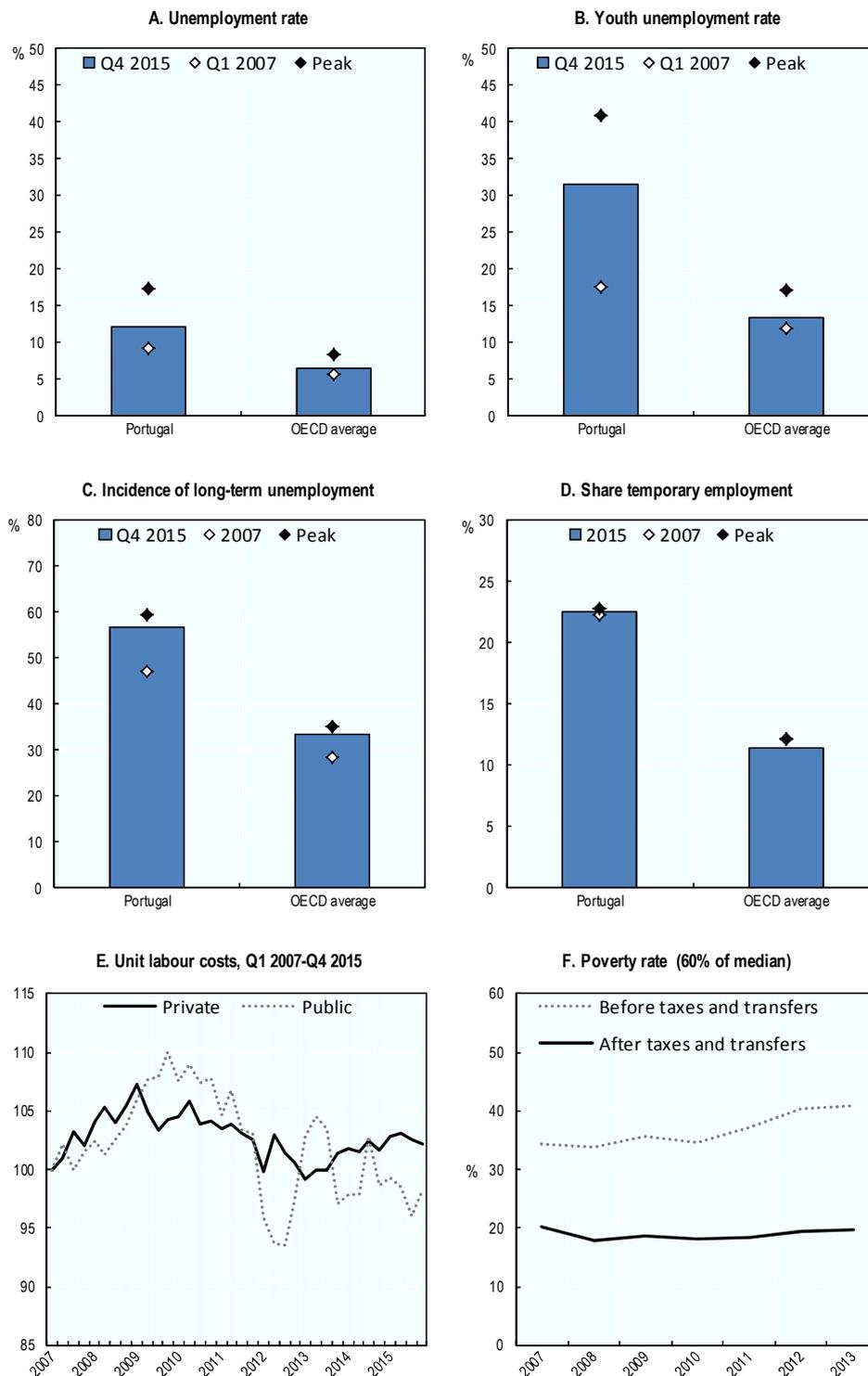
Despite the progress made, many challenges remain and there is a sense in which some reforms may not have gone far enough. The unemployment rate in Portugal remains high, particularly among youth (Figure 2, Panel B). The incidence of long-term unemployment has risen significantly, and has only recently started to fall again (Figure 2, Panel C). The labour market remains highly segmented (Figure 2, Panel D) and, unless further reforms of employment protection legislation are undertaken, this is likely to remain a defining feature of the Portuguese labour market for years to come. In addition, high rates of unemployment have resulted in rising poverty – at least before taxes and transfers are taken into account (Figure 2, Panel F).

Many of the measures undertaken during the crisis helped achieve wage moderation which, at the time of the deep recession, contributed to reduce job losses. They also helped to restore some of the competitiveness of the Portuguese economy lost in the period prior to the crisis, when wages were growing more rapidly than productivity (Figure 2, Panel E). However, the falls in unit labour costs were larger in the public sector (as a result of wage cuts) than in the private sector. In addition, the competitiveness gains in the private sector were driven primarily by improvements in productivity resulting from the exit of least productive firms from the market and the adoption of leaner production processes by surviving and new firms, rather than by falls in average compensation. In general, the evidence presented in this report suggests a high degree of nominal wage rigidity in the Portuguese economy, which could be particularly problematic at times of low inflation since it prevents real wage adjustments from taking place.

Improving employment outcomes in Portugal will hinge on further labour market reforms as outlined in this report. While some measures may require additional resources (e.g. reductions in social security contributions, increased coverage of unemployment benefits) others will provide savings (e.g. reductions in the maximum duration of unemployment benefits, better targeting of ALMPs). In addition, insofar as some of the measures will increase employment, they will also reduce expenditure on benefits while raising tax revenue. Finally, most of the measures proposed (e.g. EPL and collective bargaining reforms) will have an important impact on the labour market without additional cost to the tax payer.

Of course, labour market performance depends not only on employment policies, and there are many other challenges that need to be tackled in order to ensure more and better jobs in Portugal. The last chapter of this report outlines the main ones. First, a return to higher and more sustainable growth remains a critical condition for further improvements in the labour market. Unfortunately, based on current projections, the recovery in Portugal will only allow for some further reduction in the unemployment rate. A key obstacle to higher economic growth in Portugal is product market regulations. Despite significant improvements in this area in recent years, non-tradable sectors such as energy, transport and professional services continue to be characterised by low levels of competition and, given that intermediate inputs from these sectors are one of the most important cost inputs for firms in the tradable sector, the scope for further competitiveness gains and enhanced export performance depend crucially on further reforms in those areas. Growth and job creation in Portugal will also depend on the access that firms have to credit – the cost of which remains high compared to some other OECD countries, including Italy and Spain – as well as on reducing the tax wedge, which weighs heavily on Portuguese companies. Finally, achieving higher levels of productivity (but also inclusiveness) in Portugal will depend critically on the country's ability to upgrade the skills of its workforce, with a particular focus on the least-skilled.

Figure 2. Summary of key labour market developments



*Note:* The unemployment rate is harmonised and seasonally adjusted. Long-term unemployment covers those out unemployed for 12 months or more. The share of temporary employment is estimated as a proportion of all those in dependent employment. Unit labour costs for the private sector refer to the business economy (excluding real estate).

*Source:* OECD Labour Force Statistics Database, OECD Quarterly National Accounts Database, OECD Income Distribution and Poverty Database.



## CHAPTER 1

### LABOUR MARKET REFORMS IN PORTUGAL 2011-2015

Over the period 2011-2015, Portugal carried out a comprehensive package of reforms aimed at reducing labour market segmentation and (long-term) unemployment, on the one hand, while increasing flexibility, competitiveness and resilience, on the other. The reforms included changes to employment protection legislation (EPL), unemployment benefits, activation policies, collective bargaining and working time arrangements. This chapter offers a brief summary of these reforms, together with an analysis of their intended and (where possible) actual impact on the labour market.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

### **Employment protection legislation on permanent contracts became less stringent, and the gap with temporary contracts was reduced**

Prior to the reforms, Portugal was an outlier on the OECD's employment protection legislation (EPL) indicator for regular contracts, which was driven primarily by: demanding procedural requirements for employers initiating a dismissal process; high severance payments; and the strong likelihood of reinstatement in cases of unfair dismissal. While it is not possible to capture all aspects of EPL in an internationally comparable summary indicator,<sup>5</sup> the OECD measure nonetheless gives a sense of how restrictive regulations for individual dismissal of regular workers were in Portugal compared to most other OECD countries. At the same time, the ease of hiring temporary workers in Portugal was more or less in line with that of the OECD average, meaning that there was a large regulatory gap between temporary and permanent contracts. While not the only determinant, this regulatory gap was an important factor behind the high level of labour market segmentation in Portugal. More generally, restrictive hiring and firing practices acted as a significant barrier to the efficient (re-)allocation of labour resources across the economy.

Between November 2011 and June 2014, Portugal implemented a number of changes to its EPL, including: reductions in severance pay (particularly for permanent contracts); introduction of a new reason for dismissal (inadaptability without change to the nature of the job); and the introduction of more objective (performance-related) criteria for dismissing workers in the case of extinction of a work position (which brought them more closely in line with those used in the case of collective dismissal). These reforms reduced the protection of workers on permanent contracts in Portugal, and narrowed the regulatory gap with workers on temporary contracts. From an international perspective, these reforms rank among the most significant ones implemented in recent years.

Despite these reforms, Portugal's EPL for permanent workers remains the most stringent in the OECD, along with that of the Czech Republic. This is because some of the key difficulties of dismissing permanent workers (discussed in Chapter 3 of this report) were not addressed. Further reforms are therefore highly recommended, especially since there is some early indication that the recent EPL reforms may have encouraged on-the-job search by individual workers, as well as hiring and the share of hiring that is on permanent contracts. The analysis also suggests that significant long-term effects on productivity and growth may be expected from the recent EPL reforms implemented in Portugal.

This section starts with a brief theoretical discussion on the impact of EPL on productivity, growth and labour market duality. It then describes the recent reforms implemented in Portugal, puts them in an international context, and provides some initial evidence on their impact. Long-run productivity and growth gains are also estimated.

### ***Rigid employment protection legislation can harm productivity and growth, and is a key determinant of labour market duality***

Adjusting the level and composition of the workforce to adapt to changing demand conditions and technology is vital for effective businesses operation, and therefore for productivity and economic growth. But job displacement entails significant costs for the workers concerned in terms of earning losses and the possible obsolescence of their job-specific skills and experience. In addition, social costs can also be important (e.g. benefit payments, and expenditure on job-search assistance and active labour market programmes).

Employment protection legislation (EPL), that is the rules governing the hiring and firing of workers, has typically been designed to protect jobs and increase job stability, with the aim of preserving the individual worker and society from some of the above-mentioned costs. A related objective of EPL is to make employers internalise the social cost of dismissing workers – without which the level of turnover

5. See Chapter 2 of OECD (2013c) for further detail on the limitations of the OECD EPL indicator.

would be inefficiently high. However, in some cases, constraints imposed on firms might be excessive, hindering the effectiveness of labour market flows and the allocation of labour to the most productive jobs, thereby harming productivity and growth.<sup>6</sup>

In addition, when there is a large gap in EPL between fixed-term and open-ended contracts, firms have a clear incentive to hire workers on temporary (instead of permanent) contracts, leading to labour market duality. For new entrants to the labour market, this reduces the probability of conversion to a permanent contract, turning fixed-term contracts into a trap rather than a stepping stone to more stable employment. For workers, this reduces incentives to invest in firm-specific skills, raises work-related stress, and lowers motivation. From the firm's perspective, it increases worker turnover and recruitment costs, and also lowers productivity. In addition, firms are less willing to invest in workers who are unlikely to keep their job, further contributing to lower productivity. Finally, large differences in regulations across contracts also tend to concentrate any required labour market adjustments on non-regular workers, thereby increasing labour market segmentation.

Evaluations of past labour market reforms in Portugal have produced evidence broadly consistent with the above theory. In particular, it has been shown that reducing the complexity of procedural requirements for individual dismissal in the case of regular contracts positively affects firm performance (through the indirect effect of employment protection on worker effort) as well as the share of temporary contracts (and therefore labour market segmentation). Box 1 provides further details.

#### Box 1. The impact of previous EPL reforms in Portugal

Martins (2009) assessed the impact of the complexity of procedural requirements in the case of just dismissal on job and worker flows, on wages, as well as on firm performance. He looks at the Portuguese labour law reform of 1989<sup>1</sup> which revised the regulations governing dismissal for disciplinary reasons, setting out a new set of procedural requirements to be followed by employers. A particular aspect of this reform is that it let small firms (employing 20 or fewer workers) follow a much simpler procedure: out of the 12 specific rules that larger firms needed to follow, only four needed to be considered by smaller firms. Comparing small and large employers, Martins (2009) finds no robust evidence that such procedural requirements impact on job or worker flows (although some estimates suggest an increase in hiring), however he does find evidence that stricter procedures reduced firm performance. The author argues that this is because higher protection for workers reduces their effort on the job (although a complementary explanation is that relaxing dismissal requirements allows for better managerial practices).

Along similar lines, Centeno and Novo (2012) look at what happened when a change to the Portuguese Labour Code in 2004 extended the procedural requirements to firms with 11 to 20 workers.<sup>2</sup> They find that stricter regulations for dismissal of workers with permanent contracts result in a higher share of workers on temporary contracts, as well as an increase in excess turnover for these type of contracts. These results therefore provide evidence that a larger gap in employment protection legislation between temporary and permanent contracts results in greater labour market segmentation. Centeno and Novo (2013) use the same natural experiment as Centeno and Novo (2012) and find that increases in protection for permanent workers also reduce the wages of new workers on permanent and temporary contracts, but do not affect the wages of existing workers on permanent contracts.

1. Decree-Law 64-A/1989 of 27 February.

2. Law 99/2003 of 27 August.

Source: Martins, P.S. (2009), "Dismissals for cause: The difference that just eight paragraphs can make", *Journal of Labor Economics*, Vol. 27/2, pp. 257-279; Centeno, M. and Á.A. Novo (2012), "Excess worker turnover and fixed-term contracts: Causal evidence in a two-tier system", *Labour Economics*, Vol. 19/3, pp 320-328; Centeno, M. and Á.A. Novo (2013), "Segmentar os Salários", *Boletim Económico*, Winter, Bank of Portugal, pp. 55-64.

6. While flexibility-enhancing EPL reforms can have a positive impact on the overall level of employment, this effect tends to be relatively small (OECD, 2006).

### *Portugal implemented a range of measures to reduce employment protection on permanent contracts*

Between November 2011 and June 2014, Portugal implemented a number of EPL reforms, most of which targeted a reduction in the level of protection on permanent contracts. Central among those reforms was a significant reduction in severance pay on permanent contracts, which is now lower than that on temporary contracts (although severance pay on the latter was also reduced). Some preliminary OECD analysis suggests that these changes may have encouraged on-the-job<sup>7</sup> search as well as hiring and the share of hiring that is on permanent contracts. At the same time, because of grandfathering (i.e. the exemption of existing workers from many of the new regulations) – the effect on firing/job separations was limited. Portugal also tried to ease some of the reasons for dismissing individuals on permanent contracts. First, it introduced a new reason for dismissal (inadaptability without change to the nature of the job) – although it is not clear that it will make dismissal for inadaptability (a form rarely used in the past) any easier in practice. Second, Portugal tried to introduce more objective criteria for selecting individuals to dismiss in the case of extinction of a work position (bringing them more in line with those used for collective dismissal). Again, it remains to be seen whether this will make any difference in practice.

#### *Severance pay on permanent contracts was significantly reduced*

Before the reforms, Portugal had one of the highest levels of severance pay for the termination of open-ended employment contracts in the OECD. Regardless of tenure, every worker would be entitled to a minimum of three months' severance pay and there was no upper limit to the amount of severance pay that could be paid out. Severance payments were also higher for permanent than for temporary contracts. Taken together, this system created a significant disincentive for employers to hire workers on permanent contracts, and is likely to have harmed the efficient (re-)allocation of labour resources since firing was very costly for firms and, from the point of view of workers, entitlements to high severance pay (which are job-specific and therefore not portable) would have reduced the incentives to look for a job elsewhere, even if it could have led to a better match.

Over the period of the reforms, severance pay in the case of open-ended contracts was reduced from 30 days of base wage and tenure-based increments for every full year of tenure, to 12 days for every year of tenure. The minimum of three months' severance pay was removed, and ceilings were introduced to cap the maximum amount of severance pay that could be paid out. In the case of temporary contracts, severance pay was also reduced, although to a lesser extent (from three days per month of tenure on contracts lasting six months or less and two days per month of tenure for contracts lasting more than six months, to 18 days per year of tenure, and further to 12 days per year of tenure for contracts lasting more than three years).

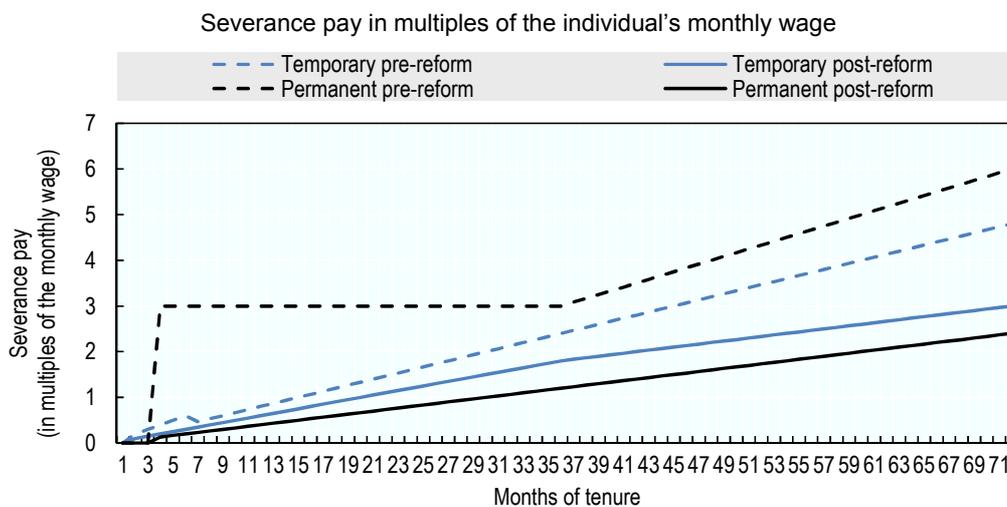
Figure 3 illustrates how the pre- and post-reform rules for severance pay differ, both for temporary and permanent contracts, and over the first 72 months (six years) of tenure.<sup>8</sup> The two key points to take away from this graph are: i) the significant reduction in severance pay on permanent contracts; and ii) that severance pay for permanent contracts was higher than for fixed-term contracts prior to the reform, but is now lower. Both of these effects should encourage hiring on permanent contracts in the future. One caveat, however, is that while the reforms tackled the gap in severance pay between permanent and temporary contracts, they left untouched the difference in procedural costs which, according to some authors (e.g. Centeno and Novo, 2012), present the largest difference between the two types of contract. In addition,

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7. On-the-job search may be seen as a lead indicator that is likely to anticipate higher rates of job-to-job mobility (Orsini and Vila Núñez, 2014).
  8. While the standard maximum cumulated duration of successive fixed-term contracts in Portugal is three years, temporary contracts of uncertain duration may last up to six years, which explains the choice of a six-year time period for the graph.

employers will have other incentives to keep on hiring on temporary contracts (see the discussion in Chapter 2 on labour market segmentation for further detail).

The new severance pay rules apply primarily to new contracts. For existing contracts, the rights accrued to date were largely preserved (called “grandfathering”). The reason for doing this was to avoid excessive job losses during the crisis. Indeed, there is growing evidence that EPL reforms engender short-run costs as their immediate impact tends to be greater on separations than on hiring, resulting (on average) in a small initial contraction of employment (e.g. Von Below and Thoursie, 2010). The preservation of severance pay entitlements will therefore have attenuated these short-term costs. On the downside, it also means that the positive effects of the reforms will take longer to manifest themselves. Figure 4 shows estimates of how fast (or rather slow) actual severance pay entitlements are converging with those intended by the new rules. If all workers on permanent contracts still had severance pay entitlements according to the old rules, then the average number of months of severance pay would be 12.2 in Q4 of 2014. If, on the other hand, all workers on permanent contracts had their severance pay entitlements calculated on the basis of the new rules, then they would receive 4.7 months on average. In practice, however, the actual level of severance pay will only slowly adjust downwards, since existing workers kept their built-up entitlements. This means that in Q4 of 2014, workers on permanent contracts were still entitled to 10.6 months of severance pay on average. Some simple linear projections based on the current trend suggest that the new rules will not apply fully until after 2021. In the case of temporary contracts, the adjustment will obviously be much faster since tenure is, by definition, much shorter on such contracts and turnover higher. As shown in Panel B of Figure 4, the new rules already apply entirely in the case of temporary contracts.

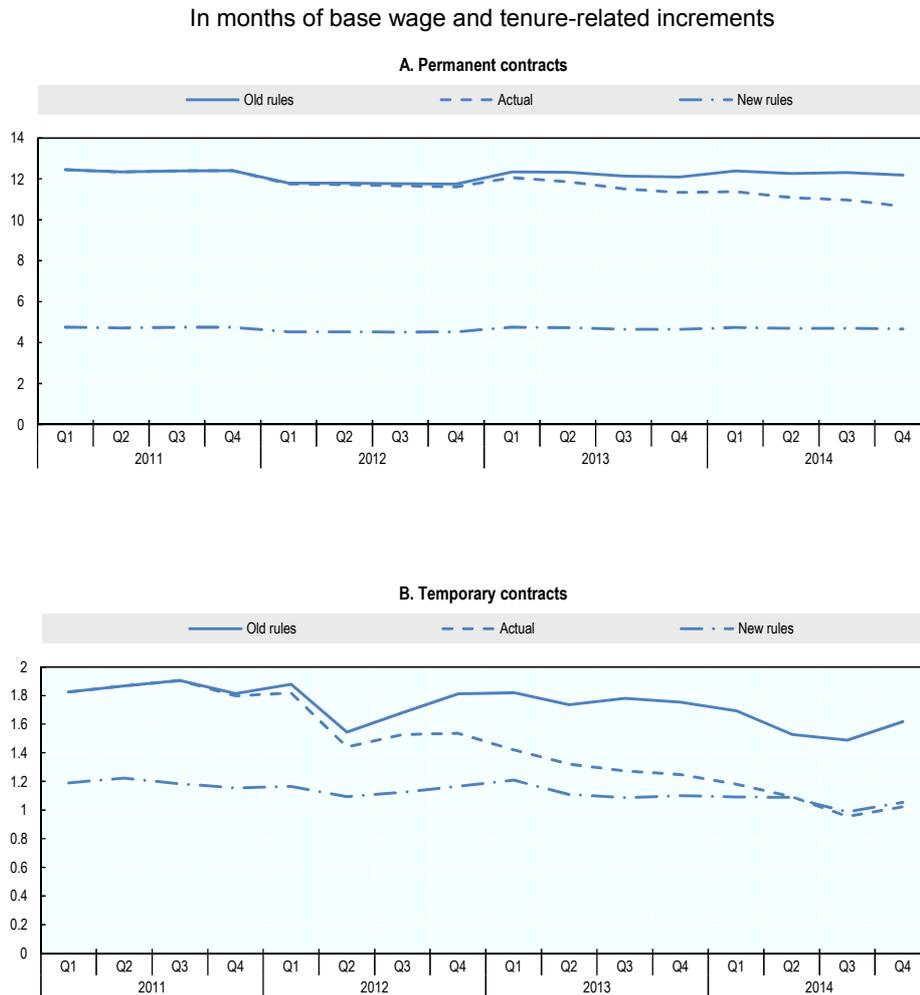
Figure 3. **Severance pay on temporary and permanent contracts before and after the reform**



*Note:* No severance pay is due if the worker is dismissed during the trial period, which is assumed to be 90 days for permanent contracts (although trial periods are longer for certain more demanding professions), 30 days for fixed-term contracts of six months or more, and 15 days for fixed-term contracts of less than six months. The graph does not illustrate the caps on severance pay introduced by the reform. Severance pay may not exceed 12 times the individual's monthly salary, which would be reached after 360 months (or 30 years) of tenure. In addition, the base wage (including tenure-based increments) for calculating the entitlement is capped at 20 times the national monthly minimum wage.

*Source:* OECD.

Figure 4. Average severance pay entitlement under the old rules, new rules and actual



*Note:* Quarterly EU-LFS data on start date, contract type and duration of temporary contracts are used to calculate the number of months of severance pay entitlement for each individual based on the information from Table A1. Given that the EU-LFS does not contain information on wages, the upper limits for severance pay are only applied in terms of the maximum number of months (i.e. 12) and not in terms of the maximum base wage (i.e. 20 times the minimum wage). Given that very few employees have wages higher than 20 times the minimum wage, the severance pay calculation will not be strongly affected by this simplification.

*Source:* OECD analysis based on the EU-LFS.

Despite the preservation of accrued severance pay rights, there is some early indication that the reforms of severance pay may have had a positive effect on on-the-job search, hiring and the share of hiring that is on permanent contracts (see Box 2). In addition, there is evidence that the grandfathering has mitigated the impact of the reform on job separations (although it introduced some inequalities between workers, depending on when they signed their contract).<sup>9</sup>

The reforms also introduced changes to the way severance payments are to be made. A dismissal fund (*Fundo de Compensação do Trabalho* – FCT) was set up which collects compulsory monthly contributions from employers into a savings account linked to each worker.<sup>10</sup> The purpose of the fund is to cover up to 50% of the severance pay in case of dismissal. Since October 2015, payments to the fund stop when this amount has been reached. When a worker is dismissed, the fund pays the part of severance pay that has been saved up, and the employer pays the remaining part. While the fund does not affect the overall cost of dismissal, it at least reduces the up-front cost as well as the liquidity risk of high severance payment obligations. If the worker leaves of his/her own accord, the employer can obtain a refund of the total amount saved up in that worker's account.

In addition, an insurance fund (*Fundo de Garantia de Compensação do Trabalho* – FGCT) was set up to protect workers in case the total amount of severance pay the employer can afford and the part paid by the FCT do not add up to 50% of what the worker is entitled to. The FGCT basically ensures that the worker receives at least 50% of the severance pay entitlement, and this is independent of the fund's performance (so the financial risk is borne entirely by the fund and the employers, and not by the workers).

While the new Portuguese system for severance payments reduces the up-front cost of dismissal to the employer and offers some insurance to the employee, it does not solve the problem that high accumulated severance pay rights act as a disincentive to mobility on the part of the worker. In this sense, the Portuguese system is very different from, for example, the Austrian severance pay system introduced in 2002, in which employers contribute to an individual worker's account which is transferrable from one employer to another. Upon retirement, employees can claim the remaining entitlements built up in their account as a cash payment or convert them into an annuity. By making accumulated severance payments entirely transferable from one employer to another, the Austrian solution eliminates obstacles to worker mobility. That being said, the Austrian system has the disadvantage that the financial risk in case the fund underperforms is borne entirely by the worker. In addition, the system is more expensive and therefore increases labour costs.

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9. The immediate positive effect on hiring combined with the delayed effect on firing is reminiscent of the transitional “honeymoon” job-creating effect described by Boeri and Garibaldi (2007) in the context of two-tier labour market reforms which liberalised the use of temporary contracts while leaving largely unchanged the legislation applying to the stock of workers employed under permanent (open-end) contracts. Their model predicts that there would be an immediate effect on hiring and therefore short-run employment gains, but that the latter would eventually be dissipated by the decline of insider workers.
10. In practice, these contributions are waived for the first two years of the existence of the fund (or until the employment contract is terminated, whichever comes first) through the temporary Employment Incentive measure (*Incentivo Emprego*).

### Box 2. The impact of severance pay reforms in Portugal on on-the-job search and worker flows

The primary objective of the severance pay reforms carried out in Portugal over the period 2011-2013 was to encourage a more efficient re-allocation of labour resources. With lower severance pay entitlements, workers might be less reluctant to switch jobs, resulting in increased on-the-job search and job-to-job flows. For employers, lower severance pay could increase both hiring and firing rates. However, because accumulated severance pay entitlements were largely preserved by the reform, one would expect the largest (short-run) effects to be on hiring only (and possibly on the firing/job-to-job moves of new hires). In addition, because the reduction in severance pay was larger for permanent than for temporary contracts, one might expect to see an increase in the share of hiring that is on permanent contracts. At the same time, it is important to remember that severance pay was cut for both types of contract, and so the reform should have encouraged hiring on temporary as well as on permanent contracts.

New OECD analysis carried out in the context of this project uses the European Labour Force Survey and the Portuguese *Quadros de Pessoal* (a linked administrative employer-employee dataset) to shed some initial light on the impact of the reforms on on-the-job search and worker flows. The intuition behind the analysis is to assess whether workers and employers most deeply affected by the changes in severance pay have the greatest change in behaviour in line with what the theory would predict. For example, one would expect to observe a higher probability of on-the-job search for those individuals for whom the difference between actual/current severance pay and that which they would have received under the old rules is greatest. Similarly, employers might be more likely to fire workers for whom the reforms have meant the greatest reduction in severance pay (as measured by the difference between actual severance pay and what they would have been entitled to under the old rules). As far as hiring is concerned, employers will be more forward-looking and interested in the new rules (applying to new hires) rather than the actual rules (applying to existing workers). In this case, one would expect to see more hiring among employers where the difference in severance pay between the old and new rules is the greatest. Finally, one might expect to see an increase in the share of hiring that is on permanent contracts amongst those employers who saw a larger fall in severance pay for permanent workers than for temporary ones.

While a range of different models are run with different dependent variables and on different datasets (full details can be found in Annex C), the basic approach is to estimate an equation of the following type:

$$Y_{it} = \beta_0 + \beta_1 SP_{it} + \sum_{c>1} \beta_c X_{cit} + \gamma_t + \delta_g + \varepsilon_{it}$$

Where:  $Y_{it}$  is the outcome of interest (on-the-job search, job separations/employment outflows, hiring, share of permanent hiring) for individual, firm or occupation  $i$  at time  $t$ ;  $SP_{it}$  is a variable which measures the extent to which the individual/firm/occupation was affected by the severance pay reform;  $X_{cit}$  are a range of individual, firm or occupation characteristics. All specifications also include fixed effects for time ( $\gamma_t$ ) and, depending on the model run, occupation/firm fixed effects ( $\delta_g$ ). Because the models explore three separate reforms (1 November 2011, 1 November 2012, and 1 October 2013) which affect different groups in different ways, they may be thought of as a difference-in-differences set-up.

The results (presented and discussed in full in Annex C) largely confirm the predictions of the theory and indicate that the reforms: promoted on-the-job search; encouraged hiring (although these results are less robust); increased the share of hiring that is on permanent contracts; and had no noticeable effect on outflows from employment into unemployment and inactivity. The effects also appear to be larger for small firms than for large ones.

Some additional and different analysis (also presented in Annex C) indicates that job separations were more likely for individuals hired just after the reform than for those hired just before – and this effect appears to be driven primarily by separations which are at the employer's initiative (i.e. firing). These results indicate that the preservation of accumulated severance pay rights for existing workers successfully mitigated the short-run effect of the reforms on their likelihood of being fired. At the same time, however, this "grandfathering" introduced some inequalities in the labour market, depending on when workers signed their contract.

While these results are interesting and broadly consistent with what the theory would predict, they need to be interpreted with care because: i) the reforms were implemented very recently and their full impact on the labour market might not be observable yet; ii) the nature of the reforms means that it was not possible to identify clear treatment and control groups, and therefore the causality of the observed effects cannot be established with full certainty. On the other hand, the findings are surprisingly consistent across models and datasets, as well as robust to a falsification exercise. Either way, further research will be required to ascertain the findings obtained here.

*A new reason for dismissal was introduced: Inadaptability without change to the nature of the job*

Another characteristic of Portuguese labour law prior to the reforms was the relatively strict definition of fair dismissal in the case of regular contracts, which derives from the Constitution itself, and which made it very difficult, in practice, for employers to dismiss workers on open-ended contracts.

Prior to the reforms, a worker in Portugal could be dismissed for inadaptability if, following a change in the nature of the job (e.g. as a result of technological change or the adoption of new production/sales practices), s/he showed a continuous fall in productivity or in the quality of the work performed, which could not be remedied by additional training and a period of adaptation on the job. In addition, the employer needed to prove that there was no other, suitable position that the worker could be offered instead (*repêchage*). The difficulty of proving the existence of these conditions (and the ensuing legal uncertainty) meant that this form of dismissal was rarely used in practice (MTSS, 2007; Monteiro Fernandes, 2012; Pestana Nascimento, 2012; Phalempin, 2014).<sup>11</sup> Analysis of Social Security data especially provided for this report suggests that inadaptability accounted for less than 1% of job separations prior to reform (Figure 5).

To give employers more flexibility, the reforms introduced a second type of dismissal for inadaptability: that which does not require a change in the nature of the post and which, therefore, is more closely aligned with the concept of dismissal for “unsuitability”. This form of dismissal also no longer requires the employer to prove that there was no other position that the worker could have been moved to instead (*repêchage*).

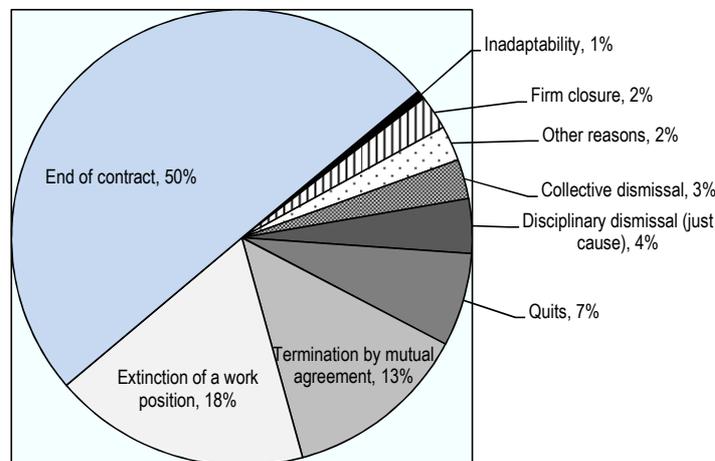
While it remains to be seen how these new regulations will be interpreted by the courts in practice, initial reactions by lawyers indicate that dismissing a worker for inadaptability (even without change in the nature of the post) will remain difficult in Portugal (Monteiro Fernandes, 2012; Phalempin, 2014). First, the procedure remains complicated (including notification and consultation procedures), and proving that a worker’s productivity or quality of work has significantly declined will remain difficult. Second, even though the new form of dismissal for inadaptability does not require the employer to prove that there was no other, suitable position available, this may make little difference in practice. This is because Article 53 of Portugal’s Constitution, which guarantees workers “security of employment” and prohibits “dismissals without just cause”, has traditionally been interpreted in a very strict sense as meaning that the employment relationship can only be terminated as a last resort, in situations where all other options have already been explored. That being said, the reform might at least send a signal to employees that the preservation of an employment relationship will, from now on, depend to a larger extent on their maintaining a satisfactory level of productivity.

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11. According to Pestana Nascimento (2012) the conditions that needed to be fulfilled for dismissal on the grounds of inadaptability were so demanding that, until the change in the law in August 2012, only two judgments were pronounced on the matter.

Figure 5. **Reasons for job separations, first six months of 2012**

As a proportion of all flows from employment into unemployment



Note: Based on a 2% extract of all individuals registered with social security on 31 December 2012. Termination by mutual agreement can include termination of the employment contract as part of a recovery plan in the case of bankruptcy.

Source: OECD analysis based on social security data.

#### *Dismissal for extinction of a work position: Closer alignment with the rules for collective dismissals*

Prior to the reforms, employers in Portugal had to follow strict seniority-based (“last in, first out”) rules to select a worker to be dismissed in case of extinction of a work position. This made it difficult for employers to adjust their workforce in accordance with their business needs. In particular, it meant that dismissals were not necessarily based on worker productivity. These requirements for individual dismissal stood in stark contrast to those for collective dismissal, where employers could define their own criteria for selecting the workers to be dismissed. Anecdotally, this encouraged small firms (fewer than 50 employees) to opt for collective dismissal instead given that, in Portugal, such firms need to dismiss just two workers for the dismissal to be classified as collective.

The reform tried, but failed (as a result of a decision of the Constitutional Court) to allow employers to also select their own criteria for individual dismissal in case of extinction of a work position. The government then had another go at re-defining the criteria, and the end result is a new set of rules which moves away from seniority-based criteria, to ones based on performance and cost. In this sense, the criteria were at least more closely aligned with those that employers would tend to choose in the case of collective dismissal. Again, however, it remains to be seen how these will be applied in practice by the courts. In particular, there appears to be concern among some commentators that performance-related criteria remain too subjective and therefore difficult to assess by the courts.<sup>12</sup> That being said, the legal system does not appear to have had much trouble to date in assessing the criteria chosen by employers in the case of collective dismissal (Carvalho Martins, 2014) – so these concerns may be exaggerated.

12. Which may lead to another rejection by the Constitutional Court (Távora and González, 2015).

Dismissal for extinction of a work position is also subject to the *repêchage* condition – i.e. the need to prove that there was no other suitable position that the employee to be dismissed could have been moved to. While the reform tried to remove this condition, the Constitutional Court ruled it unconstitutional.

***These changes have significantly reduced Portugal’s EPL – but much remains to be done***

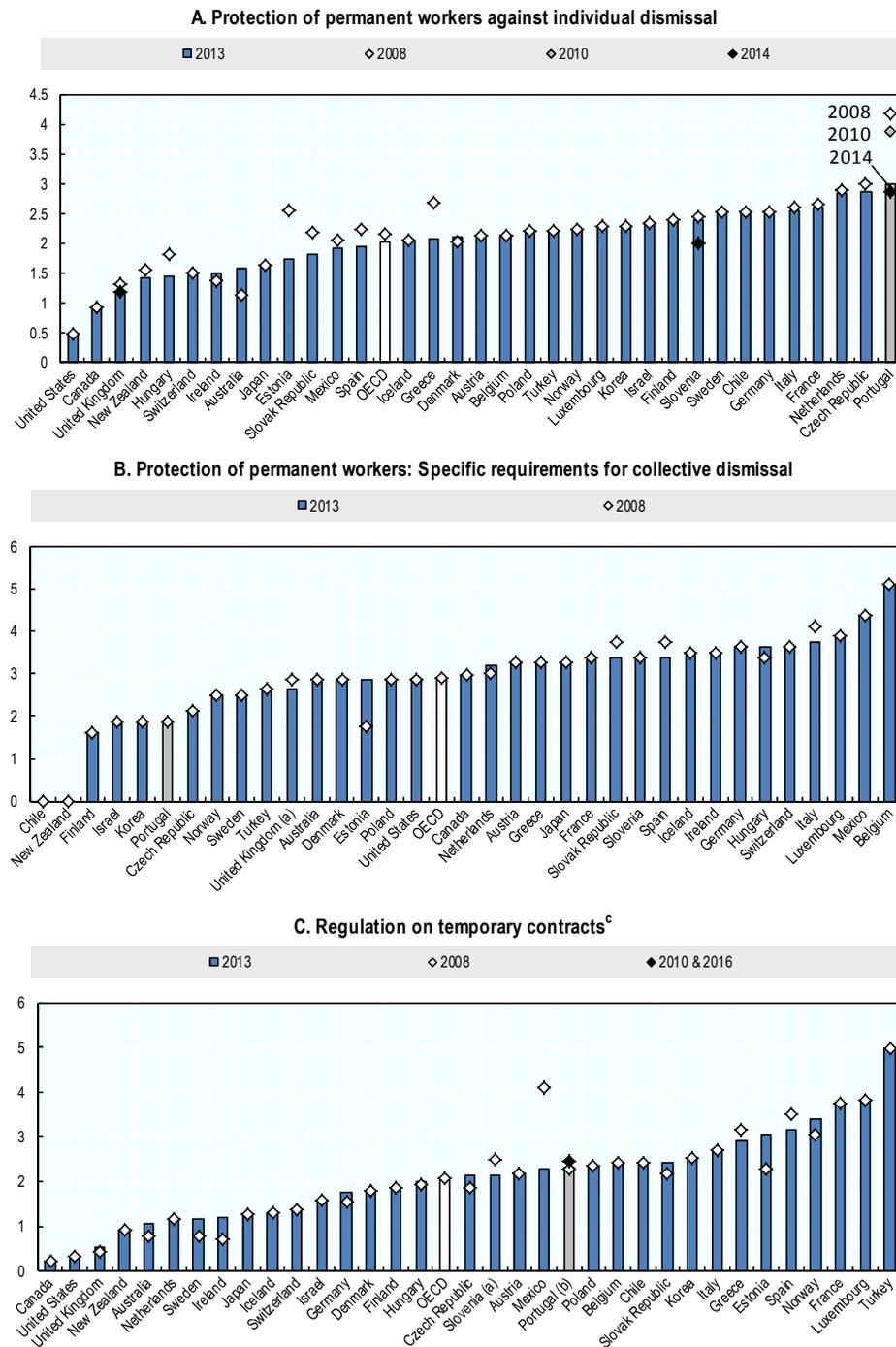
The importance of the reforms described above can be analysed using the OECD indicators of employment protection legislation (EPL), which measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts. Using this indicator, Figure 6 shows how the stringency of EPL evolved between 2008 and 2013 in OECD countries, and also provides provisional data for Portugal for the years 2014-2016 (where these are different from 2013). The stringency of EPL is shown separately for: i) individual dismissals of workers on permanent contracts (Panel A); ii) additional provisions for collective dismissals (Panel B); and iii) hiring on temporary contracts (Panel C). The comparative analysis shows that, following a trend common across many other OECD countries, the employment protection for permanent workers against individual dismissal has been significantly reduced in Portugal over the period 2008-2013. Despite this, the stringency of EPL for permanent workers remains the highest in the OECD, along with that of the Czech Republic. In the final chapter, some of the reasons behind this difference will be explored, along with further options for reform. Additional requirements for collective dismissal (e.g. notification requirements and additional delays) have always been relatively light in Portugal compared to other OECD countries, and this continues to be the case (Panel B).<sup>13</sup>

Finally, Panel C shows that hiring on temporary contracts in Portugal continues to be only marginally more difficult than in the OECD on average. During the crisis, regulation on temporary contracts in Portugal was reduced slightly, which reflects a measure which allowed exceptional renewals of temporary contracts. While the standard maximum cumulated duration of successive fixed-term contracts in Portugal is three years, two exceptional extensions of temporary contracts were permitted during the reforms. The first of these came into force on 11 January 2012 and allowed two additional extensions (not exceeding 18 months overall) of all fixed-term contracts that were set to reach the maximum duration limit by the end of June 2013. The second exceptional renewal came into force on 8 November 2013 and allowed all fixed-term contracts that would reach the maximum duration limit by 7 November 2015 to be extended twice (but not exceeding 12 months overall). As pointed out by Carvalho Martins (2014), this led to a situation where, in the most extreme case, fixed-term contracts of pre-defined duration could last for a total of five and a half years. While the purpose of these temporary extensions was to mitigate the impact of the crisis on unemployment, they may also have reduced the desired impact of the reforms on labour market duality in the short-run.

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13. If anything, Figure 6 overestimates the difficulty of collective dismissals in Portugal. This is because the OECD EPL indicator is calculated as the sum of various components which measure the additional difficulty of collective dismissal over individual dismissal. The lowest score on each of these indicators is zero, and no negative values are allowed where collective dismissal is easier than individual dismissal (as is the case in Portugal).

Figure 6. Changes in the OECD indicators of employment protection, 2008-2013



- 2014 instead of 2013.
- The lower value for Portugal for 2013 reflects the temporary measures which allowed extraordinary renewals of temporary contracts.
- This captures the relative difficulty with which employers can hire workers on temporary contracts.

Source: OECD Employment Protection Database, 2013 update and preliminary OECD calculations for Portugal for 2014-2016.

### ***Expected effect on productivity and growth***

As shown in the previous section, the EPL reforms in Portugal were significant, implying a 0.93 point fall in the OECD EPL indicator. By way of comparison, the 2012 labour market reform in Spain resulted in just a 0.44 point fall in this indicator. One would expect reforms of this type to have an impact on labour productivity growth by improving the allocation of labour resources and reducing labour market duality. However, as argued above, the preservation of severance pay rights means that the impact on productivity will take time to materialise and so the immediate effect is likely to be small and therefore difficult to measure.

It is nonetheless possible to obtain an educated guess of what the potential long-term effects on productivity and growth of the Portuguese EPL reforms are likely to be, by using estimates previously obtained in the economic literature. For instance, Bassanini, Nunziata and Venn (2009) use industry-level data for 16 OECD countries over a period of more than 20 years and show that a reduction of half a point on the OECD EPL indicator for individual and collective dismissals raises multi-factor annual productivity growth in the business sector (excluding agriculture, mining, energy, real estate and professional services)<sup>14</sup> by 0.45 percentage points and labour productivity growth by 0.3 percentage points.

Using these estimates, one would therefore expect labour productivity growth in Portugal to increase by as much as 0.56 points once the reforms fully take effect. If in addition it is assumed that the share of the business sector (excluding agriculture, mining, energy, real estate and professional services) is 53% (i.e. equivalent to its 2010, pre-reform level), and that there is no impact of the EPL reforms on employment and productivity in other industries, one would expect a 0.30 point increase in annual GDP growth.

### ***Other reforms and measures in the area of employment protection legislation***

While these will not have impacted on the OECD's indicator for employment protection legislation, a few other changes and measures have been implemented in the past few years in the area of EPL, including: additional measures to tackle dependent self-employment and changes to contracts of very short duration.

#### *Additional measures to tackle dependent self-employment have been taken*

One way in which increasing labour market duality manifested itself in Portugal was through a rise in dependent self-employment (so-called “false” self-employment or *falsos recibos verdes*<sup>15</sup>). These are situations in which the worker is formally self-employed, but the conditions of work are *de facto* similar to those of employees. For the employer, such a contractual relationship offers obvious advantages in terms of lower costs and risks.<sup>16</sup> For the worker there may be some advantages as well (e.g. the possibility of negotiating higher fees), but in practice this depends on the worker's bargaining power (which is often very low, given the lack of union representation) and frequently comes at the cost of significant reductions in social protection and job security. Because of the vulnerability that such employment relationships put workers in, many countries have legislation in place which aims to protect them, including conditions under which an employment contract would be presumed and the self-employed person considered a wage earner of the employer.

14. These industries were excluded by Bassanini, Nunziata and Venn (2009) due to the difficulty of accurately measuring multi-factor productivity growth in those industries.

15. The *Recibos Verdes* were introduced in Portugal in 1978 and were initially targeted at the liberal professions only. However, the great flexibility of the system meant that their use expanded considerably beyond their initial purpose (COE, 2015), and with it cases of abuse. Employers are not required to pay any social security contributions (which are paid by the employees), paid holidays or tenure-related salary increments.

16. Such types of working arrangements might also be used by employers to introduce additional competition for existing workers and thereby stymie wage demands and rises.

In 2012, it was estimated that nearly one in ten self-employed workers (with no employees) in Portugal was in a dependent self-employment relationship (ILO, 2014). While Portuguese labour law already defined the conditions under which an employment contract would be presumed, the reforms gave labour inspectors (*Autoridade para as Condições do Trabalho* – ACT) additional tools for enforcing the existing regulations and regularising contracts in cases of non-compliance. However, some may question what difference these new measures will make on the ground given that the ACT appears to struggle with a lack of resources to do its job effectively (Martins, 2015) and the recruitment of 80 new labour inspectors announced as part of the 2016 budget is certainly a move in the right direction.<sup>17</sup> That being said, the number of labour inspectors remains low in Portugal (307 in 2015), particularly given the fact that most firms in Portugal are SMEs.

#### *Contracts of very short duration*

The Portuguese Labour Code specifies a special form of temporary contract of very short duration (*muito curta duração*) which can be used for the purposes of seasonal agricultural activities or the organisation of touristic events. This contract is not subject to written form, although its celebration should be communicated electronically to social security. Prior to the reforms, these contracts could last no longer than a week, with a limit of 60 days over a period of 12 months. The length of these contracts was increased to 15 days, and the overall annual limit to 70 days.

#### **Access to unemployment benefits has been eased, but their generosity reduced to incentivise a more rapid return to work**

Unemployment benefits provide essential protection for workers against the loss of income from work, thus allowing them to smooth consumption as they engage in job search. In this sense, unemployment benefits have a welfare-enhancing role. In addition, by “buying time” for the unemployed, such benefits enable job searchers to find work that better matches their skills and experience. From a macroeconomic perspective, consumption smoothing acts as an automatic stabiliser. However, benefits, particularly where they are generous (in terms of replacement rates and duration), can also create disincentives for recipients to look for and take up work (OECD, 2006; Tatsiramos and van Ours, 2012; Venn, 2012) and therefore lengthen unemployment spells.

Prior to the reforms, Portugal had a relatively generous unemployment benefit system compared to other OECD countries, which is likely to have contributed to a high rate of long-term unemployment. To address this issue, Portugal lowered the cap on the maximum benefit amount and introduced a declining replacement rate to incentivise a more rapid return to work. In addition, the maximum duration of unemployment benefits was shortened – although this would only apply from the second unemployment spell onwards, so that an element of protection was kept in place during the recent episode of high unemployment. Unfortunately, this also means that the impact of the reform on long-term unemployment will take time to materialise. While it was possible to estimate the impact of the lowering of the cap and the introduction of the declining replacement rate, the early evidence appears inconclusive: the estimates indicate that these reforms have increased exits to employment, but they are all statistically insignificant. The reforms have nevertheless moved Portugal closer to the OECD average in terms of the generosity of unemployment benefits and, if past experience is anything to go by, they should eventually help shorten unemployment spells and reduce the level of long-term unemployment. That being said, the average maximum duration of unemployment benefits remains relatively high in Portugal compared to the OECD average.

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17. Three years after Law No. 63/2013 came into force, ACT detected a total of 2 488 irregular workers. Many cases were voluntarily regularised by the employer (33.6% in 2014 and 60.9% in 2015) and the proportion of cases reported to the Public Prosecutor's Office reduced from 28.1% of the total cases detected in 2014 to 13.4% in 2015.

At the same time, with soaring unemployment rates and EPL reforms which made it easier for employers to dismiss workers, there was a need to widen the safety net provided by unemployment benefits, which Portugal achieved by relaxing the contribution/employment requirements for unemployment insurance. The evidence suggests that, despite a significant increase in unemployment between 2011 and 2013, the coverage rate of unemployment benefits held up well (and even increased slightly) over the same period. Since 2014, however, there has been a slight fall in the coverage rate, which is probably related to the increase in the number of long-term unemployed (and individuals running out of unemployment benefit).<sup>18</sup>

### ***Access to unemployment benefits was made easier, but their generosity declined***

In Portugal, unemployment insurance (*Subsídio Desemprego* – SD) is available to all individuals with sufficient contribution history, and the benefit amount is estimated as a proportion of previous earnings while duration increases with age and contributory history. Those who are not entitled to unemployment insurance may be entitled to unemployment assistance (*Subsídio Social de Desemprego Inicial* – SSDI) as long as they meet the necessary contribution conditions (which are less stringent than for unemployment insurance) and pass the means test. Unemployment assistance benefit amounts are linked to the social support index (*Índice dos Apoios Sociais* – IAS) and depend on family type, while duration is calculated in the same way as for unemployment insurance. Unemployed individuals who exhausted the maximum duration of unemployment insurance may also be entitled to unemployment assistance (*Subsídio Social de Desemprego Subsequente* – SSDS) as long as they pass the means test. In the case of SSDS, the duration is equal to half the duration individuals were entitled to under unemployment insurance.<sup>19</sup> Finally, the *Rendimento Social de Inserção* (RSI) is a means-tested benefit of last resort.

In 2012, Portugal introduced reforms which facilitated access to unemployment benefits, while reducing their generosity (both in terms of duration and the replacement rate):

1. *Entitlement.* Access to unemployment insurance was made easier by lowering the necessary contributory history from 450 to 360 days over the past 24 months.
2. *Duration.* Maximum benefit duration was reduced from 900 to 540 days (depending on contributory history and age) – although additional increments based on contributory history were maintained, meaning that benefit duration for those with a long contribution history (and especially those aged over 50) could exceed this maximum. In the interest of protecting workers during the current crisis, the new rules would only start applying from the individual's second unemployment spell after the reform onwards. In the case of individuals aged 40 or over, the duration of unemployment assistance was increased (again, from the second unemployment spell onwards).
3. *Replacement rate.* The maximum amount of unemployment insurance that an individual could receive was reduced from three times the IAS to 2.5 times the IAS (but there was a temporary increase of 10% in unemployment insurance for individuals in workless households). In addition, Portugal introduced a declining replacement rate rule for unemployment insurance which meant that benefits would be reduced by 10% after six months to encourage greater job search effort.<sup>20</sup>

18. Note that an increase in long-term unemployment does not mean that the shortening of maximum benefit duration was not effective. Indeed, the rise in long-term unemployment may have been even steeper in the absence of the reforms.

19. Unemployment assistance may be renewed until the pensionable age is reached provided that: i) when unemployment begins, the insured person is aged 52 or over; and ii) by the time of its renewal, the insured person continues to meet the qualifying conditions.

20. In systems (like the Portuguese) where individuals are moved onto (less generous) unemployment assistance upon exhaustion of their regular unemployment insurance entitlement, there is, technically speaking, already

Another initiative the government took to encourage a return to work was to allow the unemployed to keep part of their benefits (50% during the first six months and 25% for the subsequent six months, within certain limits) if they accepted a full-time low-paid job.<sup>21</sup>

Finally, and in addition to the measures outlined above, the government introduced a contributory system of unemployment protection for self-employed workers who work mainly with only one contracting entity. Those who have exercised a dependent self-employment activity for at least 24 months out of the 48 preceding the termination of a service agreement, are now entitled to unemployment benefits. The generosity of these benefits depends on the individual's prior earnings, while the duration is linked to the individual's age and past labour market attachment. The system is financed through a 5% tax paid by employers. More details about the scheme can be found in Annex A. Of course, because entitlement would need to be built up to gain access to this benefit, its impact will only be noticeable in the medium- to long-term (Silva and Pereira, 2012).

***The reforms brought the generosity of Portuguese unemployment benefits closer to the OECD average, although maximum duration remains high***

As this section will show, Portugal had a relatively generous unemployment benefit system compared to other OECD countries prior to the crisis, both in terms of the replacement rate and the maximum duration of benefits. On both aspects, the reforms brought the generosity of the Portuguese unemployment benefit system more in line with that of other OECD countries, although maximum duration of unemployment insurance remains relatively long in Portugal compared with other OECD countries. At the same time, it was relatively more difficult in Portugal to gain access to unemployment insurance (due to longer contribution history requirements), and the reforms aligned the Portuguese system with standard practice across the OECD.

*Maximum duration of unemployment insurance*

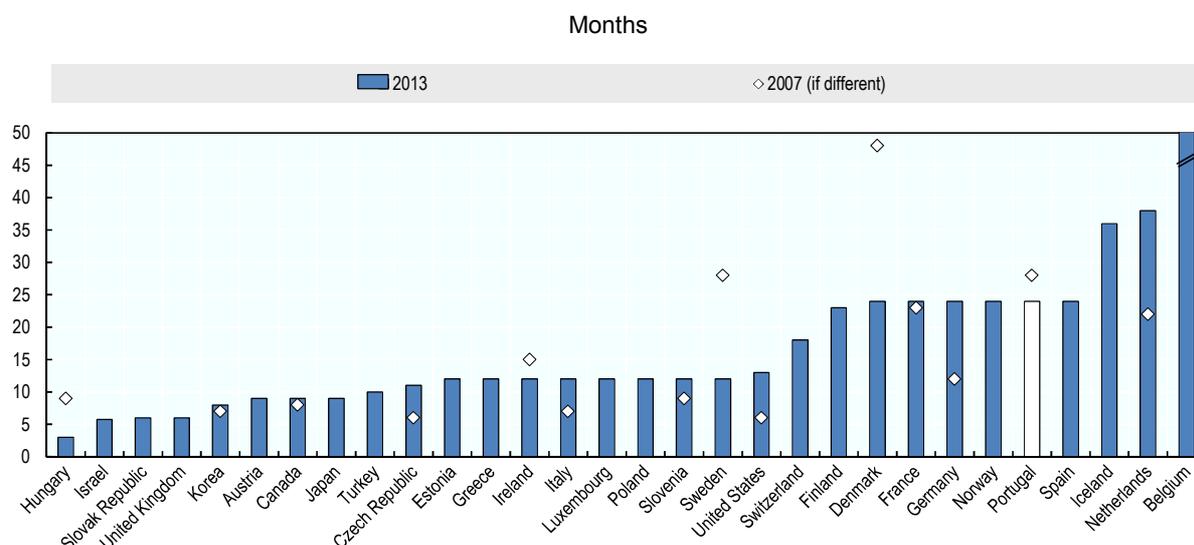
While Portugal reduced the maximum duration of unemployment insurance, it remains long compared to other OECD countries (Figure 7). In the median OECD country, the maximum duration of unemployment insurance is 12 months, compared to 24 months in Portugal. While Belgium is the only country where the duration of unemployment insurance is unlimited, it is important to point out that in many countries the duration of unemployment benefits is *de facto* unlimited because, once individuals run out of unemployment insurance, they are moved onto unemployment assistance which often can be claimed indefinitely (albeit with lower replacement rates and subject to a means test, so that coverage will be much lower). This is the case in Austria, Finland, Germany, Ireland, and the United Kingdom. In Australia and New Zealand, where no unemployment insurance exists, individuals are entitled to unemployment assistance for an unlimited period of time.

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a built-in declining benefit schedule (conditional on a means test, which often excludes those with a working spouse, for example).

21. It was already possible (since 2006) to keep part of one's unemployment benefit when working part-time. The new measure just extends this possibility (with different rules for the calculation of the benefit) to low-paid full-time jobs. Note that, in Portugal, the entitlement to continued UB payments is conditional on relatively restrictive rules around the type of work and the income from that work. By comparison, Japan's reemployment bonus allows people to keep part of their remaining benefit entitlement regardless of the type of job they move into.

Figure 7. Maximum duration of unemployment insurance, 2007-2013



Note: For Israel, maximum duration is shown for individuals with at least three dependents. In Denmark, the duration is 24 months in three years. In Belgium, the duration is unlimited. In Chile (not shown), the unemployed withdraw from an individual savings account for as long as their balance permits. For Portugal, the duration shown is estimated for a 40-year-old individual and includes additional increments based on contributory history (i.e. 720 days = 540 days + 4 x 45 days).

Source: OECD Social Policies and Data, Policy Overview Tables, Unemployment Benefits.

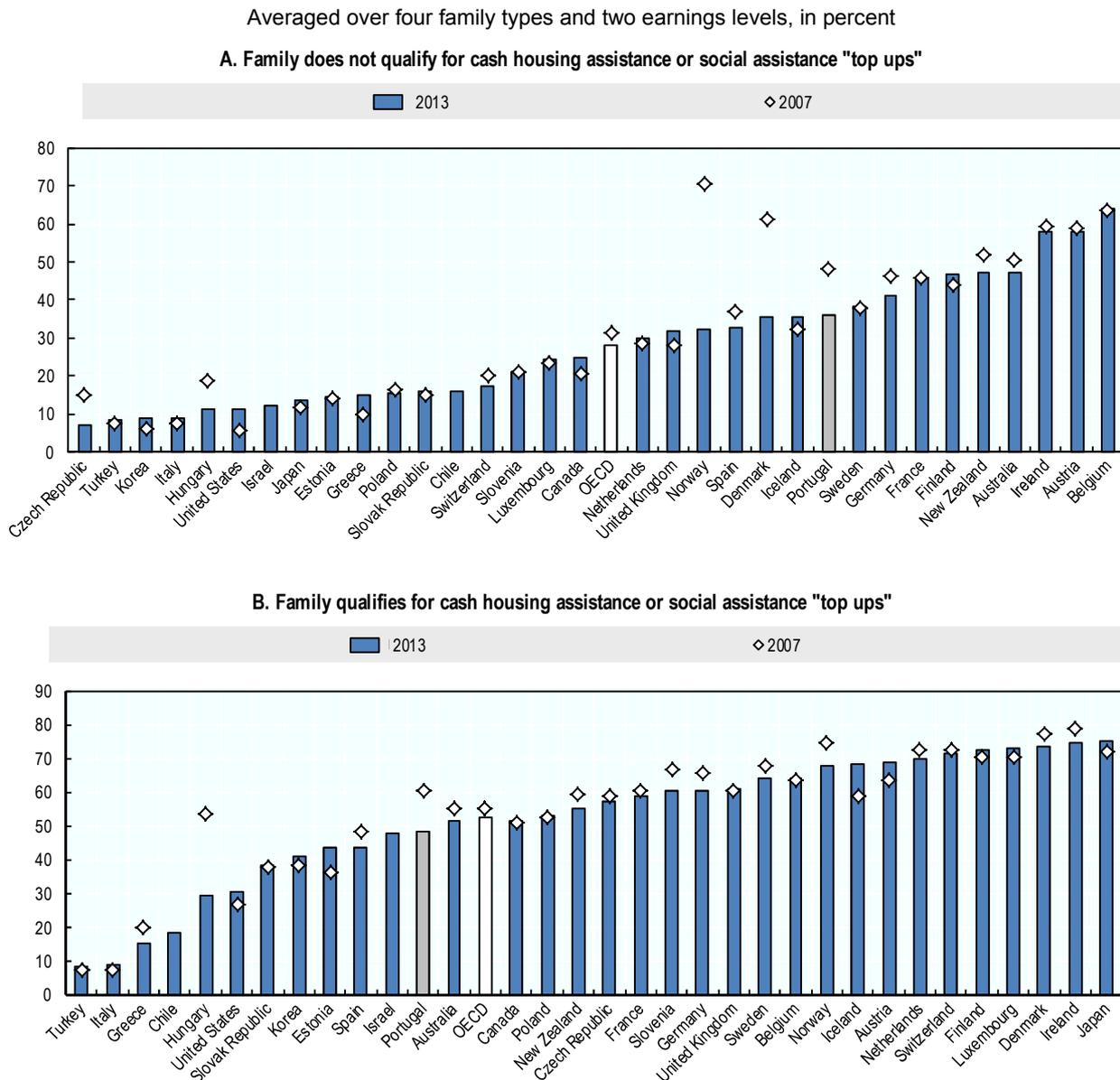
### Replacement rate of unemployment benefits

The generosity of unemployment benefits in Portugal, measured in terms of the replacement rate (i.e. the proportion of income in work that is maintained after job loss), has also moved closer to the OECD average (Figure 8, Panel A). Portugal lowered the maximum amount of unemployment insurance that an individual could receive and also introduced a reduction in benefits after six months of unemployment. Figure 8 shows the net replacement rate<sup>22</sup> (i.e. after taxes and benefits) in Portugal and other OECD countries, averaged across four different household types,<sup>23</sup> two different earnings levels,<sup>24</sup> and over 60 months of unemployment. Between 2007 and 2013, unemployment benefits across the OECD became, on average, less generous – although there are several exceptions (particularly countries where unemployment benefits were not very generous to start with). There was a significant reduction in the generosity of unemployment benefits in Portugal, which aligned them more closely with the OECD average.

22. Comparing the generosity of unemployment benefits across countries as measured by the “replacement rate” is complicated by the many different factors that countries consider when calculating an individual’s entitlement to unemployment benefit (e.g. length of unemployment spell; choice of reference earnings; floors and ceilings for unemployment benefits; number of dependents; age; interactions with the rest of the tax/benefit system; etc.) Besides differences across countries in how such benefits are calculated, these calculation rules also mean that there will be not just one, but many different replacement rates within each country. To circumvent some of these issues, the OECD computes replacement rates for “typical” worker and household cases, depending upon whether they are single or married, have children or not, for different levels of previous earnings (67%, 100% or 133% of average earnings), and for different phases of the unemployment spell.
23. Single person without children, one-earned married couple without children, lone parent with children, one earner-married couple with children. Most Portuguese households are composed of two earners with (36%) or without (24%) children.
24. For full-time earnings of 67% and 100% of average earnings.

Panel A looks at the replacement rate of unemployment benefits only, which shows that they remain slightly more generous than in the OECD, on average. However, the unemployed are entitled to other benefits, including housing benefits and social assistance (like the RSI in Portugal). Once these benefits are taken into account as well, the replacement rate in Portugal is actually slightly below the OECD average (Figure 8, Panel B). One issue here is the generosity of the RSI, which was significantly reduced in recent years and led to a large decline in the number of beneficiaries. This is something which will be further discussed in Chapter 2 of this report.

Figure 8. **Unweighted average of net replacement rates over 60 months of unemployment, 2007-2013**

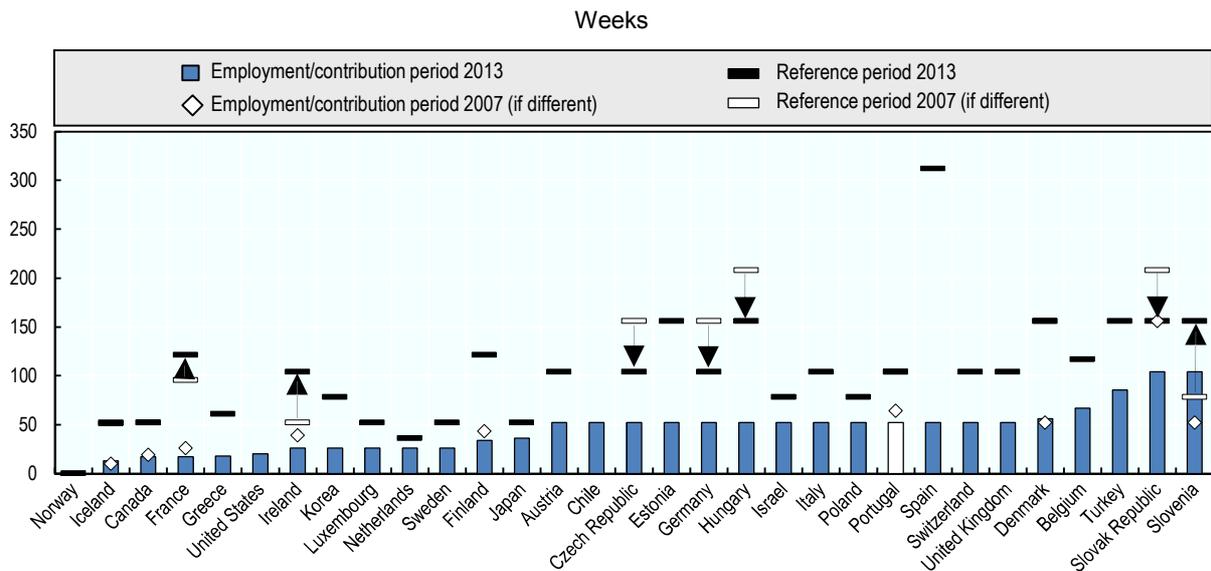


Source: OECD Tax-Benefit Models (revised 18/09/2015).

### Employment/contribution requirements for unemployment insurance

The ease of access to unemployment insurance is determined both by the employment/contribution requirements as well as by the reference period over which these contributions are calculated. Prior to the reforms, Portugal's contribution requirements were slightly higher than those generally observed across the OECD, but the reforms have brought these more in line with standard practice (i.e. around 12 months of contributions) – Figure 9. The reference period over which these contributions are estimated has not changed in Portugal but, at 24 months, is in line with OECD norms.

Figure 9. Previous employment and contribution conditions for unemployment insurance, 2007-2013



Note: In some countries, eligibility depends on employment only, in others it depends on contributions, while in others still it depends on both. Not all countries express previous employment/contribution conditions in weeks, and therefore the figures presented above are approximate only. Assumptions made for the conversion to weeks include: 1 year = 12 months = 52 weeks. For Canada, the conversion from hours to weeks is done on the assumption of 36.6 hours per week (<http://well-being.esdc.gc.ca/mis-me-iowb/.3ndic.1t.4r@-eng.jsp?iid=19>). For Greece, the calculation is based assuming the condition of 125 days in the last 14 months. In the United States, another condition is the minimum earnings requirement. For Ireland, the calculation is based on 26 contributions paid in each of the two relevant tax years preceding the benefit year. For the Netherlands, the calculation is based on eligibility for the short-term benefit. In Sweden, the individual also needs to have been a member of an insurance fund in the last 12 months. In Finland, one week equals a minimum of 18 hours only. In Japan, the individual needs to have worked more than 11 days per month. For Austria, the calculation is based on the basis of the first spell of unemployment. For Chile, the calculation is for permanent contracts. In Denmark, an additional requirement is the payment of a membership fee and the work needs to have been full-time. In Turkey, the individual needs to have contributed continuously in the last 120 days. In Norway, prior work income needs to have been 24% of the average wage in the preceding calendar year, or 49% in the three preceding years.

Source: OECD Social Policies and Data, Policy Overview Tables, Unemployment Benefits.

Figure 9 also shows that a number of other countries eased access to unemployment insurance during the crisis, either by just shortening the contribution period (Canada and Finland) or by extending the reference period as well (France and Ireland). In a few countries, unemployment insurance became more difficult to access. Chile, Germany and Hungary all shortened the reference period over which contributions would be assessed (but all had relatively long reference periods to start with). The Slovak Republic and Slovenia were both countries where access to unemployment insurance was relatively stringent prior to the crisis, but they have moved in very different directions since. While the Slovak Republic shortened both the reference and the contribution periods, Slovenia did exactly the opposite.

### *The reduction in unemployment benefit generosity should help reduce the rate of long-term unemployment*

Given the well-established link between unemployment benefit generosity and unemployment duration, one would expect the reforms in Portugal to reduce the incidence of long-term unemployment. Evidence from previous unemployment benefit reforms in Portugal has shown a clear relationship between benefit generosity and work incentives. In particular, evaluations have shown that the extension of the maximum duration of unemployment benefits in 1999 prolonged unemployment spells, and also that this reform was regressive (i.e. it benefited primarily those higher up the income distribution). Further details are presented in Box 3.

#### Box 3. Unemployment benefit generosity and work incentives: Evidence from Portugal

Júlio and Ramalho (2012) and Lopes (2015) show how exit rates from unemployment in Portugal are bunched around the time of benefit exhaustion, suggesting that unemployment benefits create disincentives for job search. A number of earlier studies had produced causal evidence of the impact of maximum benefit duration on the length of unemployment spells by exploiting a reform of unemployment benefits that occurred in 1999. These findings are discussed below.

In 1999, the maximum duration of unemployment insurance benefits in Portugal depended exclusively on an individual's age at the beginning of the unemployment spell. It ranged from ten months for individuals aged under 25, to 30 months for those aged 55 or over. In July 1999, the maximum duration of unemployment insurance benefits increased for certain age groups, with a new minimum of 12 months and a new maximum of 38 months for those aged 45 and over. Table A provides more detail on the maximum benefit durations by age group, before and after the reform.

Table A. Maximum duration of unemployment insurance benefits in Portugal before and after the July 1999 reform

Months

Before the reform		After the reform	
Age group	Maximum benefit duration	Age group	Maximum benefit duration
15-24	10	15-29	12
25-29	12	30-39	18
30-34	15	40-44	24
35-39	18	45-64	30 (+8) <sup>a</sup>
40-44	21		
45-49	24		
50-54	27		
55-64	30		

a. Individuals aged 45 or over receive two additional months for every five years of contributions over the past 20.

Source: Centeno and Novo (2007).

Using a difference-in-differences methodology, Pereira (2006) assesses the impact of this reform on the length of unemployment spells. In line with the international evidence which shows that exit rates from unemployment benefits are higher in systems that are less generous, she finds that extending the duration of unemployment benefits in Portugal in 1999 prolonged unemployment spells. She finds that for those aged under 25 and aged 30-35 on the assistance benefit (*Subsídio Social de Desemprego Inicial* – SSDI), the increase in duration of entitlements increased the average days of benefit paid (up to the end of the original entitlement period) by 17.5 days. It is important to point out that this is only the “anticipation” effect of the benefit extension, and that administrative data (as used by Pereira, 2006) do not allow estimation of the impact during the extension period or beyond, which is likely to be significantly greater.

### Box 3. Unemployment benefit generosity and work incentives: Evidence from Portugal (cont.)

Centeno and Novo (2007) exploit the same reform and find that the effect on the length of unemployment spells was smaller the greater the liquidity constraints – i.e. extending the duration of unemployment benefits was regressive as it benefited primarily those higher up the income distribution. In their policy recommendations, the authors suggest that unemployment benefit duration in Portugal should be set as a decreasing function of wages prior to the unemployment spell.

Finally, Addison and Portugal (2008) exploit the differences in maximum benefit duration before the 1999 reform and compare individuals who differed by just one year of age but who were in different age groups and, therefore, had a three-month difference in their maximum benefit duration entitlement. Over the three-month periods of the unemployment spell following unemployment insurance, the transition rates into employment were 61% to 82% higher for the groups without unemployment insurance coverage.

As a concluding remark, it is worth remembering that, in addition to unemployment insurance, unemployment assistance is available in Portugal. The relevance of this to the results presented in this box is that, when individuals can move from unemployment insurance to unemployment assistance, the impact of extending the maximum duration of unemployment insurance benefits are likely to be muted.

*Source:* Addison, J.T. and P. Portugal (2008), "How do different entitlements to unemployment benefits affect the transitions from unemployment into employment?" *Economics Letters*, Vol. 101/3, pp. 206-209. Centeno, M. and Á.A. Novo (2007), "A regressividade do subsídio de desemprego: Identificação através do efeito de rendimento da alteração legislativa de Julho de 1999", *Boletim Económico*, Bank of Portugal, Autumn, pp. 139-156. Júlio, P. and T. Ramalho (2012), "Subsídio de desemprego e transição para o Emprego", *Boletim Mensal de Economia Portuguesa*, No. 12, Gabinete de Estratégia e de Estudos, Ministério da Economia e do Emprego, and Gabinete de Planeamento, Estratégia, Avaliação e Relações Internacionais, Ministério das Finanças. Lopes, M.C. (2015), "O impacto do tempo de atribuição do subsídio de desemprego na duração do desemprego", unpublished working paper. Pereira, A. (2006), "Avaliação do impacto das alterações do sistema social de apoio do desemprego", *Boletim Económico*, Spring, Bank of Portugal.

The impact of the recent reforms is more difficult to assess. The main reason is that the most important reform (i.e. the reduction in maximum benefit duration) cannot yet be evaluated because it does not apply to individuals' first unemployment spell after the reform. It was nevertheless possible to produce some initial evidence on the reduction in benefit levels (i.e. the reduction in the cap and the declining replacement rate) (Box 4). Both the reduction in the cap and the 10% reduction in unemployment insurance after six months of unemployment appear to have increased exits from unemployment into employment for those affected – but the estimates are not statistically significant (except for the 10% reduction for individuals with low benefit levels, but then only marginally so). The evidence presented here should be seen as preliminary only, and future research should seek to replicate the analysis on larger samples and covering a longer time period after the reform.

### Box 4. Evaluating the impact of the unemployment benefit reforms

#### Reduction in maximum benefit duration

The reform which will probably have the greatest effect on the behavior of the unemployed is the reduction in maximum benefit duration. However, because workers will still be entitled to unemployment insurance under the old rules for their first unemployment spell after the reforms, it is impossible at this stage to assess the impact of this reform on unemployment duration.

#### Reduction in benefit levels

By contrast, the reductions in benefit levels (reduction in the cap and declining replacement rate after six months) have been applied to all new unemployment spells starting after April 1<sup>st</sup> 2012 and can, therefore, be evaluated. Using a 2% sample of social security records which matches individuals' contribution history to information on their benefit levels and duration, new OECD analysis presents initial evidence on the impact that these reforms have had on the probability of moving from unemployment to employment. The detailed analysis can be found in Annex D to this report. Below follows a short summary of the main results.

#### Box 4. Evaluating the impact of the unemployment benefit reforms

##### **Reduction in the cap**

To assess the impact of the new cap, a difference-in-differences model is used to compare changes in the probability of exit to employment for individuals whose benefit levels are in the range affected by the change (i.e. unemployment insurance between EUR 1 048.05 and EUR 1 257.66) to individuals whose benefit level is just below the new cap (i.e. between EUR 943.25 and EUR 1 048.05). The results indicate that the probability of exiting to employment has increased more for individuals affected by the reduction in the cap than for those who were not. However, the difference is not statistically significant. This result is confirmed in a second model where the treatment and control groups are made more similar through propensity score matching.

##### **Declining replacement rate**

To assess the impact of the declining replacement rate, a difference-in-differences model is used which compares changes in the probability of exit to employment for individuals who became unemployed in the two months prior to the introduction of the new rule (and therefore were not affected) to individuals who became unemployed in the two months after (and were affected). Once again, the treatment and control groups are made as comparable as possible through the use of propensity score matching. The results indicate that the individuals affected by the 10% reduction in unemployment insurance after six months had a greater increase in the probability of moving to employment than the individuals who were not. Again, however, the difference is not statistically significant. The only exception is for individuals on low benefits, although the coefficient is only marginally significant at the 10% level.

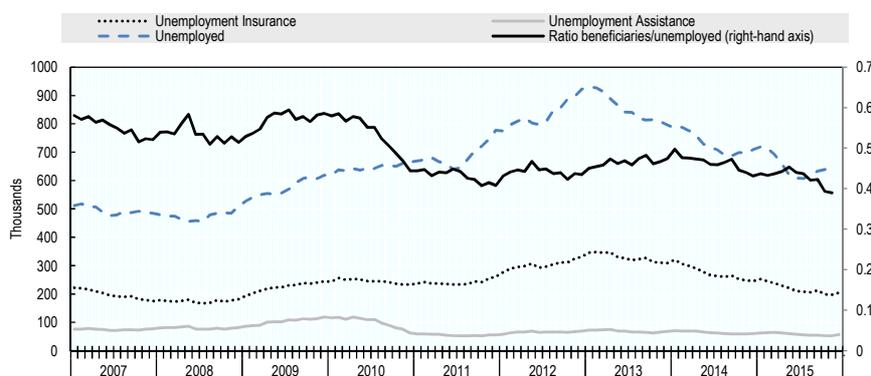
##### **Estimated savings from the reforms**

While the preliminary assessment could not detect any significant effect of the unemployment benefit level reforms on unemployment outflows, the benefit reductions will still have had an impact on the government budget. Over the period April 2012 to September 2015, it is estimated that the reduction in the cap resulted in a total saving of around EUR 70 million, while the declining replacement rate resulted in an estimated saving of around EUR 200 million. These represent an estimated 1.9% and 5.5% savings over the total amount of UI that would have been spent over this period.

#### ***Despite significant increases in unemployment between 2011 and 2013, coverage held up well***

While the number of unemployed increased by 200 000 between June 2011 and June 2013, the coverage rate (calculated as the ratio of unemployment insurance/assistance beneficiaries to the number of unemployed) rose slightly from 0.45 to 0.47 over the same period (Figure 10). This will partly reflect the easing of access to unemployment insurance in 2012. From 2014 onwards, a slight fall in the coverage rate can be observed (despite a fall in unemployment), which is likely to be related to the increase in long-term unemployment (see Chapter 2) and individuals running out of unemployment benefit (young people in particular – see Box 5). This is unlikely to reflect the new rules around unemployment benefit duration, because the grandfathering rules ensured that those would only start applying from individuals' second spell of unemployment onwards.

Figure 10. Unemployment insurance and assistance recipients and number of unemployed, January 2011 to December 2015



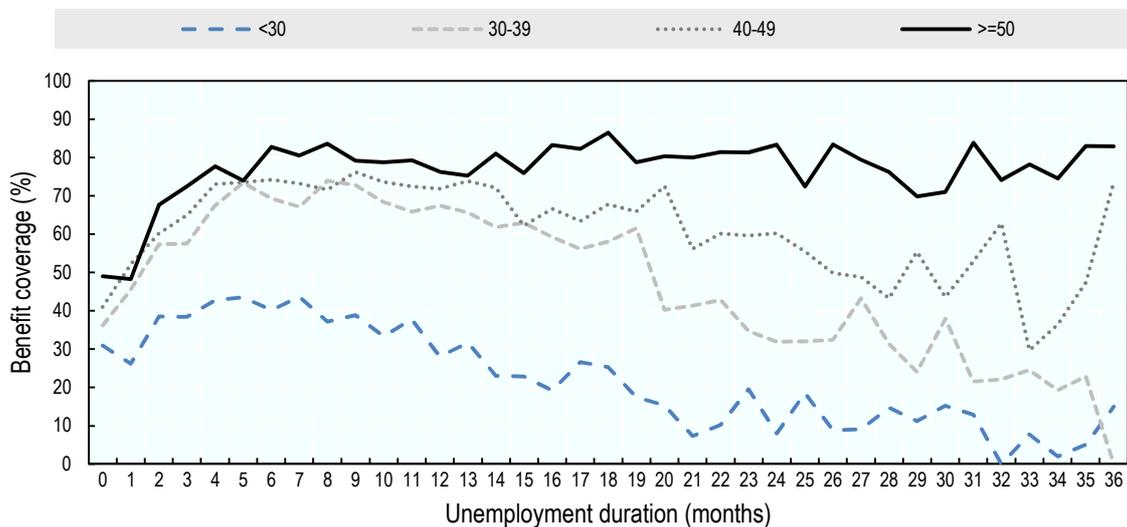
Note: Number of unemployed refers to monthly harmonised unemployment levels. Ratio of beneficiaries/unemployed is calculated as (unemployment insurance + unemployment assistance)/unemployed.

Source: Portuguese official Social Security statistics on unemployment benefits (20/01/2016 release) and OECD Short-Term Labour Market Statistics Database

**Box 5. Unemployment benefit coverage by age and unemployment duration:  
Evidence from the Portuguese Labour Force Survey**

The Portuguese Labour Force Survey (*Inquérito ao Emprego*) contains information on whether the unemployed are in receipt of unemployment benefits (insurance or assistance). This information is less reliable than that obtained from administrative sources (and which was used for Figure 10) because it is self-reported and in particular because individuals may not be able to make a distinction between unemployment benefits and social assistance. The information is nonetheless interesting because it allows one to analyse how benefit coverage varies by age and benefit duration. This analysis, presented in the figure below, shows: i) that coverage rates are lower for youth to start with; ii) that coverage declines with benefit duration; and iii) that the decline in benefit duration is steeper the younger the age group. After three years of unemployment, for example, virtually no youth are still in receipt of unemployment benefits, while the proportion of unemployed aged 50 and over is still very high (80%) and has not declined. This graph clearly illustrates that unemployment benefits in Portugal are particularly generous (in terms of duration) for older individuals. Again, it is worth remembering that the recent reforms of maximum benefit duration will not have had much effect on these coverage rates, since they only apply from the second unemployment spell after the reforms onwards.

**Figure A. Unemployment benefit coverage by age and unemployment duration**



Note: Averages calculated over the period Q1 2011-Q3 2015. Large fluctuations are due to small sample sizes.

Source: OECD analysis based on the *Inquérito ao Emprego*.

### Activation policies have been strengthened

Moving individuals from unemployment into jobs requires an effective activation framework, which includes the incentives contained in the unemployment benefit system discussed above, but goes beyond that to cover: other determinants of motivation, measures to promote employability, as well as policies to increase the number of opportunities available to jobseekers.

This section starts by presenting the key elements of the OECD's activation framework, and discusses Portugal's recent reforms in each of the areas defined by this framework. Portugal's eligibility criteria for unemployment benefits (i.e. the criteria determining ongoing eligibility for unemployment benefits which require recipients to actively look for work, take up suitable job offers or take part in active labour market programmes) have always been strict on paper. However, recent measures have strengthened the way these criteria are implemented in practice, with proven success in terms of exits from unemployment. Portugal has also significantly ramped up its offer of short-term training programmes and hiring subsidies for the unemployed, which international evidence has shown are particularly effective for the long-term

unemployed at times of crisis. Given that the coverage of these measures has been widened in recent years, there may now be a need to re-focus some of them (particularly the more costly ones) on those who need them most (e.g. youth and the long-term unemployed)<sup>25</sup> in order to reduce deadweight losses. Finally, a comprehensive strategy has been put in place to strengthen the Public Employment Service, which is a critical driver of the success of any activation programme. Going forward, it will be absolutely essential that this strategy is fully implemented.

### ***The OECD Activation Framework***

The core objective of activation policies is to help, support and encourage people to move into rewarding and productive jobs – with the ultimate aim of fostering more inclusive and resilient labour markets. The OECD has recently published a new framework for guiding the development of activation strategies to connect people with jobs (OECD, 2015a). This framework consists of three building blocks – motivation, employability and opportunities – which need to build on a solid foundation of well-functioning labour market institutions:

- *Motivation.* People need to be motivated to work. This involves making sure that work pays and tackling disincentives to work that may arise in unemployment and related benefits by making these benefits, where feasible, conditional on availability for work.
- *Employability.* For some individuals, a rapid return to work is unlikely, and so additional support may be required to strengthen their employability. Intensive counselling interviews can help detect opportunities to increase or update jobseekers' skills, review CVs, provide advice on job-search strategies or interview techniques, discuss referrals to active labour market policies (ALMPs) and modify individual action plans. ALMPs (like work experience or training) can, if well-designed and targeted, increase the employability of jobseekers in a cost-effective manner.
- *Opportunities.* Bringing people into employment also means expanding the set of available employment opportunities. This involves matching jobseekers with employers who are seeking to fill vacancies, and addressing demand-side barriers through actively engaging and assisting employers in hiring and retaining workers.
- *Institutions.* The successful delivery of the above three elements depends critically on the existence of strong PES institutions. The role that the PES plays in matching jobseekers and employers can be enhanced through: good performance management; partnership approaches between organisations and agencies to improve the co-ordination of service delivery; and seizing opportunities offered by digitisation and new technologies.

Over the course of the reform period, Portugal introduced changes to each of the building blocks outlined above. All these reforms are discussed in detail in the Annex A, and a short summary follows below.

### ***Motivation: Eligibility criteria for unemployment benefits (which were strict on paper) were applied more strictly in practice***

The reforms discussed in the previous section were largely intended to increase the incentives to return to work by reducing the generosity of unemployment benefits. However, another way of offsetting

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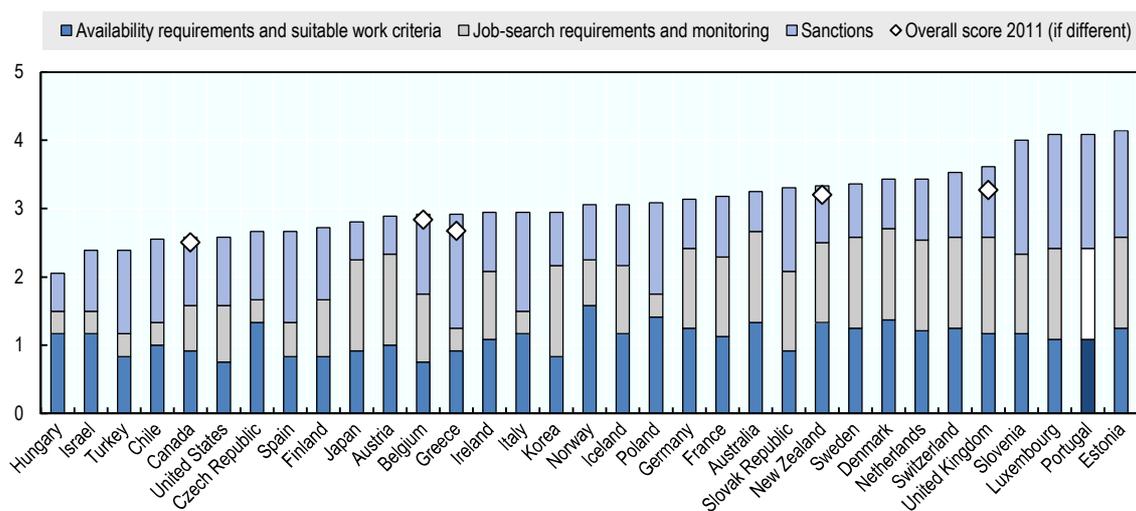
25. The evaluation literature has generally found that interventions targeted at youth tend to have smaller effects, but they are still positive, particularly in the short-run (Card, Kluve and Weber, 2015).

the negative effects of unemployment benefits on work incentives is to put in place criteria which determine the continued eligibility to receive such benefits, such as requirements that recipients actively look for work, take up suitable job offers or take part in ALMPs – with non-compliance resulting in benefit sanctions (Venn, 2012; Langenbucher, 2015). Indeed, there is growing evidence that job search monitoring and benefit sanctions can reduce the duration of unemployment and increase the rate of job entry (McVicar, 2014).<sup>26</sup>

Portugal's eligibility criteria for unemployment benefits were already among the strictest in the OECD in 2011 and its score on this indicator did not change after the recent reforms (Figure 11). Some reasons for this high score include: the requirement of fortnightly job-search interviews (which only Australia and the United Kingdom have as well) and the termination of unemployment benefits (and loss of remaining benefit entitlement) if the jobseeker refuses a suitable job offer or fails to participate in counselling interviews or ALMPs organised by the PES. A few areas where Portugal is perhaps a little less stringent than some other OECD countries include: the fact that there is no requirement to be available for work during participation in ALMPs, as well as the fact that the recipient's previous occupation, skills and/or education are considered when placing demands on occupational mobility (while in many other countries, recipients are required to accept any job that they are capable of doing, regardless of their previous occupation and the wage offered).

Figure 11. Overall strictness of eligibility criteria for unemployment insurance, 2014

Scored from 1 (least strict) to 5 (most strict)



Note: The indicator refers to the situation in mid-2014s for all countries. Availability criteria cover: availability during ALMP participation, demands on occupational mobility, demands on geographical mobility, and other valid reasons for refusing job offers. Job-searching requirements and monitoring cover: frequency of job-searching monitoring, and documentation of job-search monitoring. Sanctions cover those for: voluntary unemployment, refusing job offers, repeated refusal of job offers, refusing PES activities or ALMP placements, and refusal of PES activities or ALMP placements. For the detailed coding framework and weights applied, see Langenbucher (2015).

Source: Langenbucher (2015).

26. However, there is also some evidence that by compelling benefit recipients to take up lower paid or poorer quality jobs or jobs that do not suit their personal circumstances, strict eligibility criteria could increase the likelihood of labour force exit and reduce the quality of job matches (Venn, 2012; McVicar, 2014).

The fact that Portugal's score on the strictness of eligibility criteria has not changed does not mean, however, that nothing has improved. Indeed, one of the limitations of the OECD indicator is that it mainly reflects the strictness of rules as they are outlined in legislation or regulations, not how they operate on the ground. In the case of Portugal, for example, while jobseekers were already required to confirm their availability for work each fortnight, in practice these checks were often nothing more than an administrative requirement with very little content (Martins and Pessoa e Costa, 2014). As part of an overarching programme to modernise the Public Employment Service (*Programa de Relançamento do Serviço Público de Emprego*) new life was breathed into these job availability tests. More specifically, jobseekers aged 45 and over, as well as those who had been unemployed for six months or more, were summoned for mandatory interviews with PES case workers and referred to active labour market measures if deemed necessary. This initiative has been evaluated by Martins and Pessoa e Costa (2014) and has been found to double the monthly reemployment probability of those who had been unemployed for at least six months (see Box 6). This compulsory, bi-monthly monitoring mechanism has recently been replaced by a more personalised monitoring model, which includes quarterly action planning and ensures that different types of follow-up actions are carried out each semester (Law 34/2016 of 24 August).

**Box 6. Reemployment and substitution effects from increased activation: Evidence from times of crisis**

The *convocatórias* introduced as part of the 2012 labour market reform in Portugal required specific unemployment benefit recipients to meet jobcentre caseworkers and then participate in active labour market programmes. This initiative has recently been evaluated by Martins and Pessoa e Costa (2014) who focus on the group of unemployed who had been out of work for six months or more (and who were younger than 45). More specifically, the authors compare the outcomes of this group to those of the group of individuals with unemployment spells shorter than six months. They find that the probability of exiting from unemployment and into employment was doubled for individuals subject to the programme. As the authors point out, their results are all the more important given that the programme was implemented during a period of high unemployment. Indeed, in a situation where job vacancies are rare, one might expect the scope for displacement effects to be greater. Yet, using a different dataset in a comparative analysis across 86 job centres, they find no evidence of substitution effects such as decreased transitions to employment amongst non-eligible individuals.

Source: Martins, P.S. and S. Pessoa e Costa (2014), "Reemployment and substitution effects from increased activation: Evidence from times of crisis", *IZA Discussion Paper Series*, No. 8600.

***Employability: New training measures were introduced and participation increased significantly***

The programme to modernise the Public Employment Service also contained a host of measures to strengthen the employability of jobseekers, including: the referral of the unemployed to job search assistance or short-term training programmes within two weeks of registration; the introduction of career managers who accompany certain jobseekers on an individual and continuous basis; and more detailed and regularly updated individual action plans. Two short-duration training programmes were introduced in 2013: *formação transversal* (a 25-hours training programme aimed at improving personal, communication, and job search skills); and *Vida Ativa* (short, modular training courses, or validation of existing skills within three months of registration at the Public Employment Service). The number of participants in training measures increased significantly, from 339 824 in 2010 to 535 534 in 2014 (more than a 50% increase).<sup>27</sup> Such programmes have been associated with positive employment outcomes both in Portugal and in other countries (and particularly for the long-term unemployed and during recessions) – see Box 7 for further details.

27. These figures are taken from the IEFP's *Relatório de Execução Física e Financeira* of December of each of each year and refer to *formação profissional*.

**Box 7. The effectiveness of active labour market programmes: Existing evidence from Portugal and abroad**

Reviewing over 200 econometric evaluations of active labour market programmes (ALMPs) published since 2007, Card, Kluve and Weber (2015) reach four important conclusions about such measures: i) while they tend to have a negligible impact in the short-run, they positively affect employment outcomes after about 2-3 years; ii) programmes that focus on human capital accumulation tend to have the greatest impact; iii) ALMPs are particularly effective for the long-term unemployed; and iv) they are more likely to be effective in a recession. A key policy recommendation made by the authors is to provide “countercyclical job training programs and private employment subsidies” at times of crisis to prevent the long-term unemployed from “leaving the labor force, risking permanent losses in the productive capacity of the economy.” This is exactly what Portugal has done during the recent recession.

Evidence on the effectiveness of active labour market programmes in Portugal is much rarer, and the methodology used by most of the existing studies does not always stand up to scrutiny. It is therefore critical, going forwards, that more resources are poured into the careful monitoring and evaluation of ALMPs in Portugal.

Costa Dias and Varejão (2012) estimate that ALMPs increase the probability of employment by between 10 to 25 percentage points although – given that the authors cannot fully control for unobservable characteristics which simultaneously determine selection into the programmes and labour market success – these estimated impacts may be biased depending on the quality of the control variable data, the impact of motivational factors (particularly when participation is voluntary), and other factors. Consistent with the evidence of Card, Kluve and Weber (2015), they also find that such measures (training programmes in particular) tend to show effects only several years after participation. Nunes (2007) finds positive employment effects of subsidised internships that took place between 1998 and 2003, while Centeno, Centeno and Novo (2009) find a small reduction in unemployment duration of participation in job-search assistance programmes. The authors argue that this modest effect may be due to a lack of wage subsidies at the time when the programmes were implemented – a shortcoming which has since been addressed by the Portuguese Government.

*Source:* Card, D., J. Kluve and A. Weber (2015), “What works? A meta analysis of recent active labor market program evaluations”, *RUHR Economic Papers*, No. 572. Costa Dias, M., and J. Varejão (2012), *Estudo de Avaliação das Políticas Ativas de Emprego: Relatório Final*, Faculdade de Economia da Universidade do Porto, Porto, Portugal. Nunes, A. (2007), *Microeconomic Studies on Programme Causal Effects – Empirical Evidence from Portuguese Active Labour Market Policy*, PhD Thesis, Department of Economics, University of Coimbra, Coimbra, Portugal. Centeno, L., M. Centeno and Á. Novo (2009), “Evaluating job-search programs for old and young individuals: Heterogeneous impact on unemployment duration”, *Labour Economics*, Vol. 16/1, pp. 12-25.

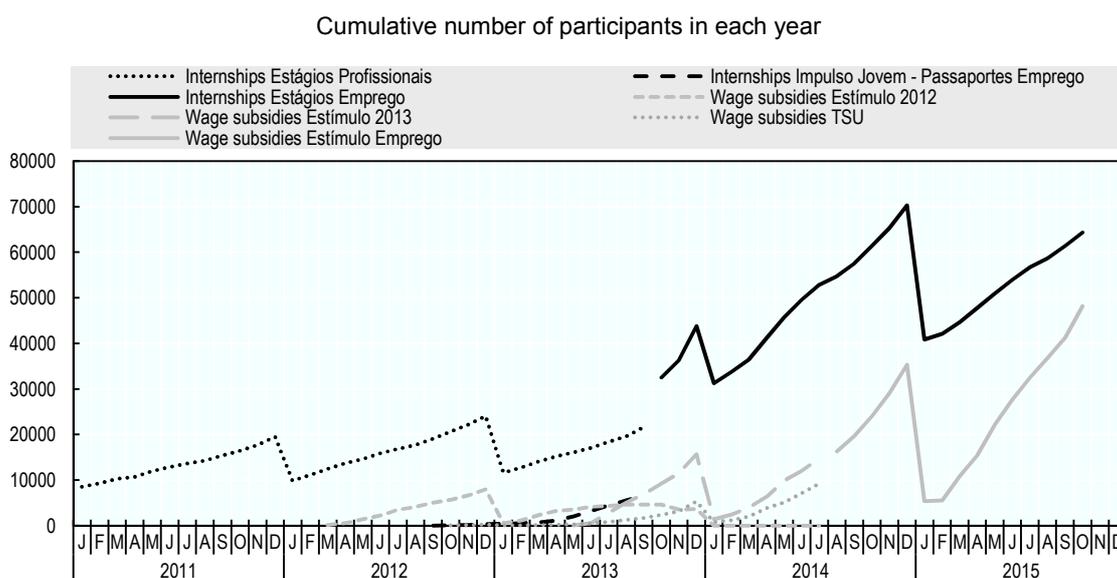
***Opportunities: Job broking activities have been strengthened and new hiring subsidies have been introduced***

The successful activation of jobseekers depends not only on their motivation and employability, but also on the existence of sufficient demand. A key factor here is, of course, economic growth. While there is little the PES can do to promote growth, it nevertheless has a crucial role in ensuring that jobseekers have access to as wide a range of employment opportunities as possible, independently of the state of the business cycle. In particular, the PES plays a critical role in job broking – i.e. in matching jobseekers with employers who are seeking to fill vacancies. The Portuguese PES is undertaking a number of steps to strengthen its activity in this area. One of these is to set up a vacancy-registration tool, disseminated via social media, and integrated with an online vacancy database (*Portal NetEmprego*). On the employee side, the PES is trying to improve the electronic registration of the unemployed, including the possibility to upload individual action plans. There are also plans to co-operate more closely with other stakeholders (temporary work agencies, private employment agencies, employer associations, Offices for Professional Insertion – *Gabinetes de Inserção Profissional*) to better capture existing job vacancies.

While job broking is crucial for matching jobseekers and employers, some groups of jobseekers may need additional support to ensure that job opportunities are available to them. This may be the case in particular for low-skilled and/or young workers whose (expected) productivity may not exceed the minimum wage employers are required to pay for them (OECD, 2010c). For these types of workers, targeted hiring subsidies might incentivise employers to take them on, and this is an area in which Portugal has been particularly active in recent years. Two different hiring subsidies (*Estímulo 2012* and *Apoio à*

*Contratação via Reembolso da TSU*) were introduced in 2012, both revised in 2013, and eventually merged into one programme (*Estímulo Emprego*) in 2014. While these programmes have been focused primarily on youth, the low-skilled and the long-term unemployed, their coverage has changed and broadened over time (see Annex A for details). Incentives were also built in to encourage employers to offer participants permanent employment contracts (either to start off with, or as a conversion at the end of the subsidy). The subsidies awarded were relatively important in size. For example, *Estímulo 2013* covered 50-60% of the beneficiary's wage for a period of six months, and up to a maximum total value of six times the IAS (i.e.  $6 \times \text{EUR } 419.22 = \text{EUR } 2\,515$ ). As shown in Figure 12, the hiring subsidies went from no participants in 2011 to nearly 50 000 over the first ten months of 2015. While such programmes have been shown to have positive employment effects (see Box 7), they can also have significant deadweight losses (i.e. the subsidisation of workers who would have been hired anyway, even in the absence of the programme). One estimate suggests that, in the case of *Estímulo 2012*, around 60% of employers said they would have created the job even in the absence of the subsidy. Still, deadweight losses are never entirely avoidable and the loss estimated in the case of *Estímulo 2012* is actually relatively low in comparison with estimates for some other programmes from abroad (which have frequently been put at around 90%<sup>28</sup>). That being said, as the overall unemployment rate in Portugal continues on a downward trend (see Chapter 2), it may be necessary to increasingly focus the resources dedicated to such programmes on the unemployed who need them most (i.e. youth and the long-term unemployed). International evidence shows that hiring subsidies can be a very cost-effective and efficient means of reducing unemployment if they are sensibly targeted, especially on the long-term unemployed (Brown, 2015).

Figure 12. Participation in hiring subsidies and subsidised internships, 2011-2015



Note: The graph shows the cumulative number of participants in each year, by month. Participants who have not completed the programme in December of year T are carried over to year T+1.

Source: OECD analysis based on IEFP Statistics, *Síntese da Execução dos Programas e Medidas de Emprego e Formação Profissional*.

28. See Martin (2000) and Bartik (2001).

Some related measures are the subsidised internships like the *Estágios Profissionais* and the *Passaportes Emprego*, later merged under the name of *Estágios Emprego*, or also the *Contratos Emprego-Inserção* (which are work experience programmes for the long-term unemployed and RSI beneficiaries). These programmes help groups at the margins of the labour market (particularly youth and the low-skilled) gain valuable work experience, and often contain a training element. During the reform period, several changes were introduced to these programmes, often with the intention of broadening their coverage. Figure 12 shows how the number of participants in these programmes (excluding the *Contratos Emprego-Inserção*, which remained relatively stable) increased significantly from less than 20 000 in 2011 to more than 70 000 in 2014. The *Estágios Emprego* also seem to have very positive employment outcomes, with 67% of participants in work nine months after conclusion of the programme (Government of Portugal, 2014). Again, there might be a need to re-focus those programmes on those who need them most as the recovery takes hold.

New analysis carried out in the context of the present report and based on administrative data from the Public Employment Service confirms that subsidised internship programmes appear to have a positive impact on the employment outcomes of participants compared to non-participants (Box 8). The analysis further suggests that, amongst the programmes analysed, hiring subsidies have the greatest effect on the probability of employment of participants, while the effect of *Vida Ativa* and socially useful work is much more limited. However, it is important to stress that the analysis presented in Box 8 cannot control for selection into programmes based on unobservable variables which, in turn, might co-determine the outcome of interest. An important lesson to take away from this is that more research and evaluation is needed in Portugal on the effectiveness of active labour market programmes. Evidence produced by such research could help, in turn, to fine-tune the programmes concerned and to develop an ALMP portfolio which is more effective at helping the unemployed back into work. While it may be more difficult to properly evaluate existing programmes, new ALMPs should be trialled on a random, pilot basis.

**Box 8. The effectiveness of active labour market programmes in Portugal:  
New evidence based on administrative PES data**

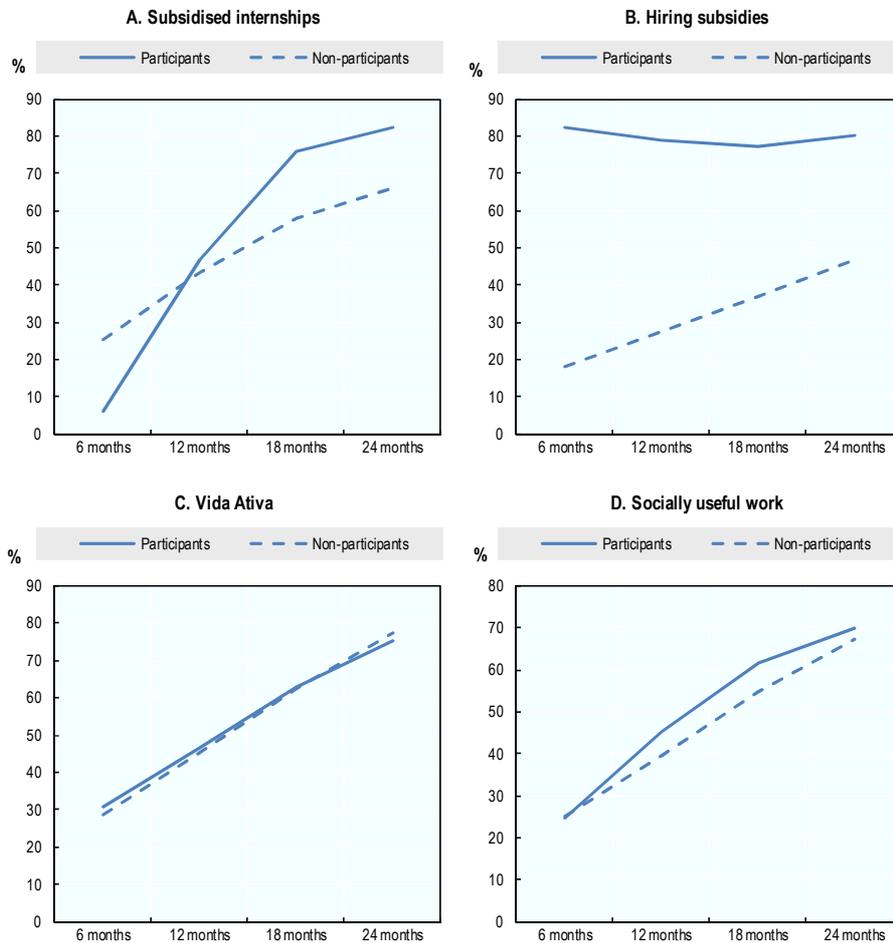
This box summarises new evidence for Portugal on the employment outcomes of participants in active labour market programmes over the period 2012-2014, based on administrative data provided by the Public Employment Service. The full analysis as well as a description of the data can be found in Annex E to this report. The analysis covers four programmes: i) subsidised internships (*Passaportes Emprego*, *Estágios Profissionais*, *Estágios Emprego*); ii) hiring subsidies (*Estímulo 2012*, *Incentivo à contratação*); iii) *Vida Ativa*; and iv) socially useful work (*Contrato Emprego-Inserção*, *Contrato Emprego-Inserção+*).

Individuals who enrolled in one of these programmes at time  $t$  are compared to a set of “control” or similar individuals who did not enroll in that programme at time  $t$ . The control group is formed using propensity score matching (PSM) techniques. More specifically, individuals are matched on the basis of age, gender, marital status, number of children, years of schooling, date of registration with the PES and previous employment history. It is important to point out that, while PSM presents a number of advantages over other techniques (like ordinary least squares), it does not allow researchers to retrieve the causal impact of a programme on employment outcomes if selection into the programme occurs on the basis of unobservable characteristics. So the findings obtained here should be interpreted in this light. Once the matching is complete, the employment outcomes of the treatment and control groups are compared at six months’ intervals:  $t+6$ ,  $t+12$ ,  $t+18$  and  $t+24$ . Because time is measured from the start of participation in a programme, it is possible that individuals may still be participating in the programme at time  $t+6$  (depending on the length of the programme). The results of this analysis are summarised in Figure A.

After six months, individuals participating in subsidised internship programmes are clearly still enrolled in the programme, however after that their employment outcomes improve significantly faster than those of non-participants (Panel A). Those who benefit from a hiring subsidy have a very high probability of being employed throughout the period – an effect which persists even after 24 months (Panel B). By contrast, *Vida Ativa* appears to have very little impact on employment outcomes (Panel C) – which may be because of the modular nature of the programme and/or the short duration of many interventions included under this programme. Finally, the employment impact of socially useful work is small and seems to disappear in the long-run (Panel D).

**Box 8. The effectiveness of active labour market programmes in Portugal:  
New evidence based on administrative PES data (cont.)**

**Figure A. Probability of being in employment at various time intervals for participants versus non-participants in a selection of ALMPs**



Source: OECD analysis based on administrative data from the Portuguese PES.

***Institutions: A comprehensive programme to modernise the Public Employment Service was launched***

As mentioned at the beginning of this section, the success of any activation strategy will depend critically on the strength of the institutions that are expected to implement it. In line with this, Portugal set out to improve its PES, and how it interacts with other stakeholders. A key element in this was the merging of Job Centres with Professional Training Centres to achieve a closer alignment between employment and training services offered to jobseekers. The reform also announced the introduction of stronger performance management and evaluation mechanisms: an efficiency rating system of local PES offices; customer satisfaction surveys; and regular monitoring and evaluation of placement efforts and job search activity. Efforts are also underway to modernise the PES' information systems, including: a re-design of the website; a new system for arranging interviews through e-mail and/or text messages; and breathing new life into the SAI – an interactive customer service. However, not all of these measures have been fully implemented and, going forward, it will be critical to make sure that they are.

PES performance can also be improved by introducing a greater degree of contestability and, with this in mind, Portugal relaxed the rules around the setting up of private and temporary work agencies (see Annex A for details). While the government has also announced plans to allow the PES to contract out some of its activities to private employment agencies, in practice this has still not materialised (although there are plans for two pilot projects – European Commission, 2015). It is important to point out, however, that contracting out public employment services is difficult to get right in practice, and that the evaluation literature shows mixed results. That being said, under the right contractual arrangements, private providers can improve outcomes for certain groups, bring innovation to service delivery, and introduce competitive pressure which may improve PES performance (Finn, 2011). It is particularly important to place enough weight on the quality of service provision and to have strong information systems in place which allow performance to be monitored accurately.

### **The reforms aimed to make collective bargaining more decentralised, dynamic and representative**

While collective bargaining can play an essential role in making labour markets operate more efficiently, it can also introduce important distortions when wages are pushed significantly above those that would prevail in a perfectly competitive market. This balance is difficult to get right in practice and also depends on economic and political circumstances, other labour market institutions, as well as the degree of trust between social partners – all of which help explain why the collective bargaining systems of most countries are in a constant state of flux.

Despite earlier reforms, the Portuguese collective bargaining system continued to struggle with issues of representativeness at the onset of the crisis. In particular, the combination of unrepresentative employer organisations and trade unions, on the one hand, and the practice of quasi-automatic extensions of collective agreements, on the other, led to the imposition of a large number of wage floors across the economy which, because they did not represent the circumstances of many non-signatory firms, harmed competitiveness and employment. Such wage floors can be particularly harmful during times of crisis, when a lack of wage flexibility is more likely to translate into job losses (Villanueva, 2015). In addition, extension agreements were often applied retrospectively so that firms covered by such extensions incurred large and sudden costs.<sup>29</sup>

A significant number of reforms were implemented during the crisis, all aimed at making the Portuguese collective bargaining system more representative, decentralised and dynamic. Extensions of collective agreements were temporarily frozen after Portugal received financial assistance from the Troika in May 2011 and, from November 2012 onwards, extensions were only granted if the collective agreement met certain criteria in terms of the representativeness of the employers that signed up to it. However, the initial representativeness rule (requiring the employer organisation to represent 50% of workers in the relevant sector) may have set the bar too high, ruling out extensions in the majority of cases. While the rule was later relaxed by also allowing extensions in cases where 30% of the signatory employers are small and medium enterprises, it remains to be seen what impact this will have on the share of agreements that are extended. However, given the very large share of SMEs in the Portuguese economy, it seems likely that the bar has now been set too low and that most agreements will again meet the conditions for extension without the need for significant additional effort in terms of employer organisation. As part of the package of reforms, Portugal also allowed firm-level agreements to be negotiated by works councils in firms with at least 150 employees (previously this threshold was set at 500 employees) – but the lack of worker representation in smaller firms raises questions about how much difference this will make in practice. Portugal also shortened the survival period of collective agreements that have expired and not been

29. Currently, the retroactive effects of such clauses are limited to the first day of the month in which the extension order is published, which largely solves the problem – although it may be desirable to enshrine this practice into legislation.

renewed, which should help increase the frequency with which such agreements are renegotiated. Finally, a possibility was introduced for employers to temporarily suspend a collective agreement (or certain terms contained in it) at times of crisis. While it makes sense that such action cannot be taken unilaterally by employers, the uncertainty about how cases of disagreement with worker representatives are resolved mean that this measure is unlikely to be much used in practice. It would also help if the conditions under which such clauses can be used by employers can be clarified.

Since the reforms, there has been a significant drop in the number of collective bargaining agreements and in the number of workers covered by them. While the freezing of and new rules around extensions will have played some part in this, the crisis itself will have made employers more reluctant to negotiate new wage terms. In addition, there is evidence that the decline in sector-level bargaining already started in the mid-1990s, and was accelerated by provisions contained in the 2003 Labour Code which weakened the bargaining power of unions. While the most recent data show that the number of collective agreements is rising again, it remains to be seen whether it will recover to pre-crisis levels, and also whether there will be a permanent shift towards more firm-level bargaining or not. Compared to other OECD countries, Portugal's wage bargaining system remains highly centralised and, so far, there has not yet been a strong shift towards firm-level agreements (in contrast to what has happened in Greece and Ireland, for example).

The remainder of this section discusses pre-crisis weaknesses in the Portuguese collective bargaining system, explains the reforms, and assesses their impact on the number and type of collective agreements, as well as on the bargaining coverage rate. The final part discusses the Portuguese reforms from an international perspective.

### ***Collective bargaining can make the labour market operate more efficiently***

Collective bargaining can fulfil an essential role in the efficient operation of labour markets by correcting two important market failures: i) the asymmetry of information between workers and employers; and ii) the asymmetry in bargaining power between these two groups. By addressing these market failures, collective bargaining can ensure that workers' voice is heard and that they are paid in line with their productivity – leading to a more efficient allocation of resources across firms and industries. Other efficiency gains might result from the fact that transaction costs will be lower than if bargaining was done at the individual level, and also, if markets are imperfect, from a reduction in monopsony power of the firm. In addition, collective bargaining can result in more compressed wage distributions (Addison, 2015). In particular, a combination of high union density and bargaining coverage with the centralisation/co-ordination of wage bargaining have been shown to go hand-in-hand with lower overall wage inequality (OECD, 2004). Lower wage inequality, in turn, could be beneficial for economic growth (OECD, 2015b).

However collective bargaining can also introduce distortions in the labour market. This can occur when rent-seeking behaviour pushes wages significantly above those that would prevail in a perfectly competitive market, resulting in lower employment (and possibly higher income inequality) than would otherwise be the case. In the presence of extension mechanisms, collective bargaining can also become an anticompetitive tool if a limited number of incumbent firms agree on higher wages to prevent new firms from entering the market or eliminate existing competition. The extent to which collective bargaining is distortionary rather than efficiency-enhancing will depend on number of factors, including: the flexibility of the collective bargaining system in responding to changes in economic conditions and/or the needs of individual firms, as well as the representativeness of the agreements reached. These, in turn, will depend critically on the institutional characteristics of a country's collective bargaining system.

### ***The Portuguese collective bargaining system prior to the reforms***

Prior to the reforms, it had been argued that collective bargaining in Portugal resulted in some important distortions of the labour market, introducing wage rigidity, higher unemployment, as well as lower resilience of the economy to fluctuations in the business cycle. The distortionary effect of collective

bargaining was largely blamed on a combination of unrepresentative employer organisations and trade unions, on the one hand, and the quasi-automatic extension of collective agreements, on the other.

Trade union density in Portugal is only slightly above the OECD average (20.5% versus 17.1% in 2012) and significantly below the rates observed in the Nordic countries (67.2% in Denmark, 68.6% in Finland, 82.6% in Iceland, 53.3% in Norway and 67.5% in Sweden).<sup>30</sup> At the same time employer representation is weak. Estimates based on administrative data (*Quadros de Pessoal*) suggest that, on average, employer organisations in Portugal represent just 38% of workers.<sup>31</sup> Moreover, as Table 1 makes clear, such representation varies significantly by industry, from as little as 9% in the water sector to over three quarters in the financial and insurance sector.<sup>32</sup>

Despite low trade union and employer representation, collective agreements in Portugal covered around 90% of workers prior to the crisis (Addison, Portugal and Vilares, 2015), which can be explained by the fact that collective agreements were extended almost automatically by the government to the entire sector, upon simple request of one of the parties to the agreement.<sup>33,34</sup> This led to a situation where wage agreements reached between a minority of firms and workers (often men with permanent contracts and high job tenure, working for large employers or firms shielded from competition – Portugal and Vilares, 2013; Vilares, 2015) would be extended to all other firms and workers in the sector.

Because these agreements set wages at a very detailed level (both by industry and by occupation), the collective bargaining system in Portugal effectively imposed as many as 30 000 wage floors across the country each year (Martins, 2014) – which are believed to have had negative consequences in terms of firms' competitiveness, employment as well as labour market segmentation (see Box 9). To make matters worse, when collective agreements were extended, the corresponding wage clauses often applied retrospectively, forcing employers affected to pay the resulting wage arrears. This exacerbated the potential negative effects of administrative extensions on competitiveness and employment (Cardoso and Portugal, 2005; Martins, 2014).

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30. These figures are taken from OECD and J. Visser, ICTWSS database, version 3.0. Note that this rate includes the public sector where density is believed to be much higher than in the private sector. Estimates by Addison, Portugal and Vilares (2015) based on the *Relatório Único* put the union density rate in Portugal at a much lower figure: 11% on average over the period 2010-2012. This estimate is based on a question which asks the employer to “Indicate the number of workers for whom you have knowledge of their membership in a union (because they are union officials, because you deduct membership dues from their salary, or because the worker informed you about his/her membership so as to determine which particular collective regulation is applicable to their case).” However, given that there is no legal obligation in Portugal to disclose union membership, the figures reported by employers in the *Relatório Único* are likely to be an underestimate.

31. These estimates are consistent with those obtained elsewhere. The 2006 *Livro Verde sobre as Relações Laborais* (MTSS, 2006) already pointed out that a large proportion of employers are not affiliated to any employer organisation, and the 2007 *Livro Branco das Relações Laborais* (MTSS, 2007) found that there was no worker representation of any kind in two thirds of Portuguese workplaces.

32. It is important to point out that some important groups will never be represented by collective agreements: the unemployed and potential start-ups.

33. Voluntary extensions by the employers to non-unionised members are also very common because there is no legal requirement for trade unions to reveal their constituency. Employers are therefore faced with the practical impossibility of distinguishing between workers who are union members (and for whom the agreement is binding) and those who are not.

34. Another reason for the high level of coverage is that agreements tended to remain valid for a relatively long period of time.

Combined with the facts that: i) firms are legally prohibited from reducing base wages (unless this is permitted by collective agreement)<sup>35</sup> and ii) collective bargaining agreements in Portugal can sometimes be difficult to re-negotiate, this system resulted in a high level of downward wage rigidity in the Portuguese labour market, which is particularly harmful at times of crisis with low inflation: if firms cannot adapt to worsening economic conditions by lowering (real) wages, the only other adjustment channel left is employment.<sup>36</sup> During the recent crisis, this is indeed what has been observed: large numbers of workers had their wages frozen (see Box 14 in Chapter 2), but low inflation meant real wages moved little and large employment losses ensued (Carneiro, Portugal and Varejão, 2014).

**Box 9. There is evidence that quasi-automatic administrative extensions of collective bargaining agreements in Portugal have harmed competitiveness and employment**

Research has shown that the quasi-automatic extension of collective agreements in Portugal has had negative effects in terms of employment (including the quality of employment), as well as firm survival.

Guimarães, Martins and Portugal (2014) tentatively use the term “upward nominal wage rigidity” to refer to the consequences of the Portuguese collective bargaining system which obliges firms to increase the wages of their workforce in order to comply with the administrative extensions of collective agreements. Using the potential increase in a firm’s wage bill (measured as the difference between workers’ current wages and those implied by the new wage floors), the authors find that, over the period 1986-2009, firms more heavily affected by changes in wage floors decreased their hiring rates and, more importantly, significantly increased their separation rates: a 10% increase in the wage bill led to a fall in employment of 2.1%, which is largely driven by an increase in separation rates (which increased by 2.3 percentage points in response to a 10% increase in the wage bill). The authors also find that a 10% increase in the (real) wage bill increased the probability of firm closure by 7.8 percentage points.

Looking at what happens following an extension of a collective bargaining agreement in a particular sector, Martins (2014) finds that employment decreases by 2% four months after the extension is issued, resulting from both a fall in hiring and an increase in firm closures (but no significant change in separations or firm start-ups is observed). In addition, Martins finds that such administrative extensions (which also entail the payment of substantial wage arrears) tend to increase the share of dependent self-employment (and therefore labour market segmentation) as firms seek to reduce their costs. The author also finds that small firms are more negatively affected by such extensions.

Building on this work, Hijzen and Martins (2016) analyse what happened when Portugal suspended the extensions of collective bargaining agreements in mid-2011. Their work suggests that extensions had a negative impact on employment growth, concentrated amongst non-affiliated firms. The authors further argue that the lack of representativeness and the retro-activity of extensions are key drivers behind this negative employment effect – particularly in the context of a recession.

The evidence found for Portugal is consistent with the international evidence on extensions of collective wage agreements (Villanueva, 2015): while extensions can be useful tools to reduce wage inequality and gender gaps, there is a risk that they come at the cost of employment losses, particularly during recessions. Any income gains made by workers covered by extensions therefore need to be weighed against the income losses incurred by those who lose their job.

*Source:* Guimarães, P., F. Martins and P. Portugal (2014), “Upward nominal wage rigidity”, paper presented at the Deutsche Bundesbank/Institute for Employment Research conference on “(European) Labour markets and the economic crisis” held on 12/13 June 2014 in Eltville, Germany; Martins, P.S. (2014), “30,000 minimum wages: The economic benefits of collective bargaining extensions”, *IZA Discussion Paper Series*, No. 8540. Villanueva, E. (2015), “Employment and wage effects of extending collective bargaining agreements”, *IZA World of Labor*, No. 136.

35. See Article 129 of the Labour Code: “É proibido ao empregador diminuir a retribuição, salvo nos casos previstos neste Código ou em instrumento de regulamentação colectiva de trabalho.”

36. Cardoso and Portugal (2005) had shown that the contractual wages set by collective agreements set a floor to remuneration and that actual wages frequently exceed those minima, giving rise to a “wage cushion”. This wage cushion gives firms some flexibility to adjust real wages downwards at times of crisis – however this mechanism only really works if inflation is positive.

Table 1. **Employer organisations' membership and density, 2010-2014**

Percentage of companies member of employer organisations, and percentage of workers employed by member companies of employer organisations (average 2010-2014)

Industry	% employers member of employer organisation	% members that are SMEs	% of workers covered by employers that are member of an employer organisation
A Agriculture, forestry and fishing	8.8	99.9	13.9
B Mining and quarrying	21.0	99.0	34.0
C Manufacturing	20.2	97.6	49.2
D Electricity, gas, steam and air conditioning supply	6.9	92.4	10.7
E Water supply; sewerage, waste management and remediation activities	9.7	99.7	9.9
F Construction	16.7	99.4	33.2
G Wholesale and retail trade; repair of motor vehicles and motorcycles	19.5	99.6	42.8
H Transportation and storage	32.0	99.2	35.2
I Accommodation and food service activities	22.2	99.6	45.3
J Information and communication	9.0	98.9	11.4
K Financial and insurance activities	17.2	95.9	76.7
L Real estate activities	11.9	100.0	14.5
M Professional, scientific and technical activities	12.6	99.8	19.2
N Administrative and support service activities	12.4	94.5	42.0
O Public administration and defence; compulsory social security	4.7	100.0	6.0
P Education	17.7	99.4	31.4
Q Human health and social work activities	10.5	99.3	14.3
R Arts, entertainment and recreation	8.9	98.7	24.4
S Other service activities	13.7	99.8	15.8
U Activities of extraterritorial organisations and bodies	6.5	100.0	1.0
Average	17.6	99.1	37.7

Source: OECD analysis based on the *Quadros de Pessoal*.

### ***Reforms of the Portuguese collective bargaining system***

The recent labour market reforms introduced a number of changes to collective bargaining in Portugal in an attempt to make it more:

1. *Representative*. After a freezing of administrative extensions from May 2011 onwards, criteria were introduced towards the end of 2012 for approving future extensions of collective agreements. The reasoning behind such representativeness criteria is to limit the potential negative effects of extensions on the competitive position of non-affiliated firms. Ideally, such criteria should be challenging enough (so that they work as an incentive for employers to organise), but not too challenging (so as to make extensions virtually impossible). The first representativeness rule introduced in Portugal stated that extensions would only be granted if the employers who signed the agreement employed at least 50% of the workers in the sector, geographical area or occupation to which the agreement was to be extended. However, given the low employer organisation density rate in Portugal (see Table 1), this condition more or less ruled out most extensions and was probably too demanding. Part of the problem is that a very large proportion of employers in Portugal are SME's (with fewer than 250 employees) and that these are difficult to organise. Acknowledging this economic reality, the government subsequently introduced an additional rule

allowing extensions in cases where the signatories to the agreement consist of at least 30% of micro-, small- and medium-sized enterprises. While it remains to be seen what effect this new rule has, one would largely expect a return to the pre-crisis situation given that 99.7% of firms in Portugal are SMEs. Indeed, data on employer organisation membership in 2012 suggests that, on average, 60% of the members of employer organisations in Portugal were SMEs, and that only 23 out of 410 employer organisations had fewer than 30% SME members.

2. *Decentralised.* The second change to the collective bargaining process was to allow works councils in firms with at least 150 employees to negotiate agreements at plant level (previously, as part of the 2009 revision of the Labour Code, the threshold had been set at 500 employees). In theory, this would allow negotiated wages and working time arrangements to more closely reflect a firm's economic reality.<sup>37</sup> Some commentators have argued that this will not make much difference in practice, given that the Portuguese Constitution grants trade unions exclusive rights to negotiate on behalf of workers (Article 56) and that works councils will therefore only be allowed to conduct such negotiations if the necessary powers are delegated to them by unions.<sup>38</sup> However, such rules are common throughout the OECD (except in Greece and Romania) and exist because company-based worker representation is never truly independent of the employer. For example, under existing laws, works councils cannot call a strike, which significantly reduces their bargaining power. Even in Germany, where there has been a clear shift towards company-level bargaining, legislation formally prohibits works councils from concluding firm-level agreements on issues covered by collective bargaining unless they are expressly authorised to do so by the relevant sector agreement (Addison et al., 2014). A more important problem in the case of Portugal is that worker representation in small firms is very poor (Visser, 2016).<sup>39</sup> Estimates based on the European Company Survey suggest that only around 8% of establishments in Portugal with 10-249 employees had some form of workplace representation in 2013, compared to 40% on average in the other countries that participated in the survey (Figure 13).<sup>40</sup>
3. *Dynamic.* The third change aimed to encourage more frequent and swifter re-negotiations of collective agreements by placing additional constraints on the time for which they remain valid. On the one hand, the reforms targeted cessation clauses contained within certain older collective agreements which stipulated that the agreement would remain in force until it was replaced by a

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37. The reforms also further encouraged the inclusion of articulation clauses between different levels of bargaining, particularly on matters of functional and geographical mobility, the organisation of working time, and compensation.

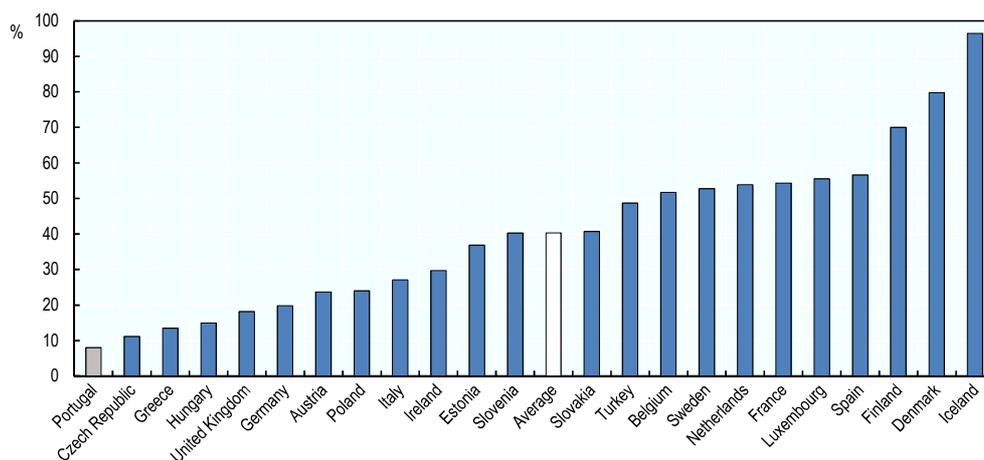
38. Reform proposals favouring agreements that can be signed independently of the trade union had to be abandoned in the face of strong union opposition (Addison, Portugal and Vilares, 2015). That being said, even before the reforms, there were some atypical collective agreements signed at plant level between employers and their works councils that have proved successful over the years (Palma Ramalho, 2013). However, such agreements, where they were signed without the mandate of the relevant union, would not be legally enforceable (Távora and González, 2015).

39. Because smaller firms have no (or little) union representation in Portugal, the lowering of the threshold in 2012 to allow agreements in smaller firms to derogate from higher-level agreements could be argued to have increased the level of disarticulation of the system. As pointed out by Visser (2013), however, "Articulated bargaining is rare. Most countries are either stuck with a more centralised solution, usually because there is no enterprise-level representation that has the trust of the unions and capability to confront management in bargaining, or local bargaining proceeds without strong checks and balances."

40. Visser (2013) mentions the interesting case of Hungary where the exclusive right of unions to negotiate collective agreements was removed at the turn of the millennium and a legal provision was introduced to allow works councils to sign collective agreements in the absence of union organisation in the workplace. However, this measure was not effective because, despite being mandatory, effective works councils existed only where unions were present. The provision was repealed again in 2002.

new one. The validity of such cessation clauses was reduced from five to three years.<sup>41</sup> In addition, a cap of 18 months was placed on the grace period (*sobrevigência*) which kicks in when one of the parties withdraws from an agreement and which allows for negotiations to take place (there was no cap prior to the reforms). Finally, the additional grace period (*ultra sobrevigência*) for which the agreement remains valid if negotiations turn out to be unsuccessful was reduced from 60 to 45 days.

Figure 13. **Proportion of establishments with 10-249 employees that have some sort of worker representation, 2013**



Source: OECD analysis based on the European Company Survey.

In addition to the reforms outlined above, employers can (since September 2014) temporarily suspend a collective agreement at times of crisis (i.e. for reasons of “hardship” or “inability-to-pay”) as long as: i) this can be shown to be necessary for the preservation of jobs; and ii) the necessary agreement has been obtained from the relevant trade union(s). While such a safeguard makes sense to protect workers from potential abuse by employers, it is not clear what would happen in the case of disagreement between unions and employers – which makes the measure difficult to implement in practice and, therefore, reduces its potential effectiveness.<sup>42</sup> It would also help if the conditions under which employers can suspend a collective agreement could be clarified. In Spain, for example, sectoral agreements have to include objective conditions (such as a fall in sales or productivity over a specified period of time) that specify when firms may opt out of what was agreed.

41. There was also a suggestion to further reduce the validity of such cessation clauses to two years, but it is not clear that this would make much difference in practice. Based on an analysis of agreements that have already been denounced, Naumann (2014) concluded that the length of the survival period of agreements with cessation clauses would be of little practical relevance because: i) very few of these had a cessation clause; and ii) the last revision of these agreements dated back to more than 15 years, making the survival period irrelevant.

42. It has been argued that a major stumbling block to the use of such opt-out clauses is that works councils need explicit agreement from the union to negotiate agreements at the firm level. While this is probably true, there is a strong argument for maintaining such union consent, which is that works councils are never truly independent from their employers and therefore have much weaker bargaining power (especially since they are usually not legally entitled to call a strike).

### Impact of the collective bargaining reforms

*The number of sector agreements has dropped, but not only because of the reforms*

Since the reforms, there has been a significant drop in the number of sector agreements as well as in the number of extensions of these agreements – although the latest data show some recovery. The number of sector agreements fell from 142 in 2010 to just 27 in 2013, but was back up again to 65 in 2015 (Table 2). Similarly, the number of extensions fell from 128 in 2010 to 9 in 2013, but stood at 44 in 2015. More significantly, the ratio of extensions to sector agreements had fallen markedly (from around 100% prior to the reform to just over a quarter in 2011) but, in 2015, increased again to 68%.

Table 2. Evolution of collective agreements and extensions, 2008-2015

Year	Number of agreements <sup>a</sup>				Workers covered				Extensions (of sector agreements)	
	Total	Sector	Groups of firms	Firm level	Total	Sector agreements	Agreements between groups of firms	Firm-level agreements	Number	% <sup>b</sup>
2007	251	160	27	64	1 430 660	1 430 660	58 233	32 384		
2008	296	172	27	97	1 894 846	1 778 216	47 232	69 398	178	103%
2009	251	142	22	87	1 487 193	1 299 371	59 902	37 952	128	90%
2010	230	141	25	64	1 485 950	1 309 267	64 455	33 344	149	106%
2011	170	93	22	55	1 242 181	1 160 080	52 737	24 102	24	26%
2012	85	36	10	39	404 756	291 068	26 645	9 909	13	36%
2013	94	27	18	49	241 539	197 017	27 104	17 418	9	33%
2014	152	49	23	80	246 643	214 603	19 596	12 444	16	33%
2015	138	65	20	53	568 875	446 025	21 728	22 624	44	68%

a. Sector agreements (*Contratos Coletivos de Trabalho*, CCT) are agreements negotiated between one or more employer organisations and one or more trade unions. Agreements between groups of firms (*Acordos Coletivos de Trabalho* – ACT) are signed by several employers that are not part of an employer organisation and one or more trade unions. Firm-level agreements (*Acordos de Empresa*) involve just a single employer.

b. The percentage of agreements that are extended may exceed 100% because the numerator measures the number of extensions that were granted in a specific year, while the denominator measures the number of agreements signed in that year.

Source: MSESS/DGERT.

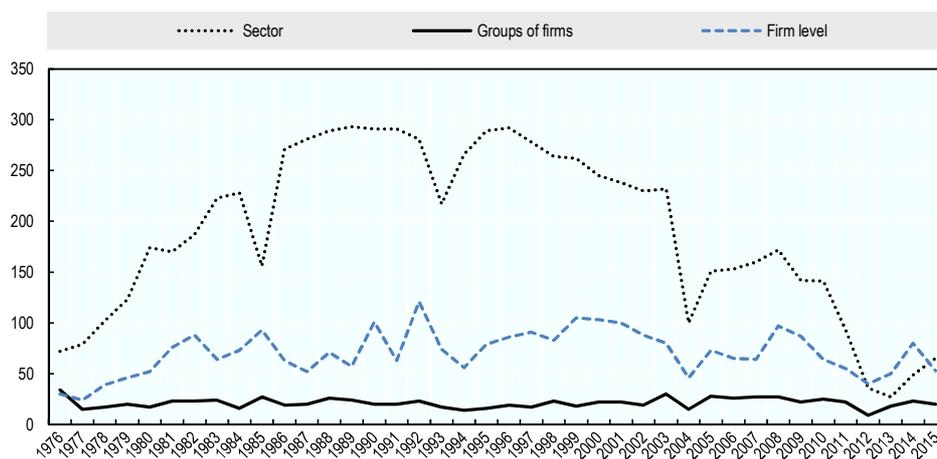
There is some disagreement as to why the number of sector agreements has fallen so drastically, although the reasons advanced are not mutually exclusive. Some commentators contend that, as a result of the reforms, employers have been reluctant to sign agreements which are unlikely to be extended to other firms in the sector because this would put them at a competitive disadvantage (Campos Lima, 2013; ILO, 2014). This would also help explain why there has been an increase in agreements in 2014, following the softening of the rules around the extension of agreements towards the middle of that year. An alternative interpretation is that these trends are simply a consequence of the crisis and the attempt by employers to reduce costs by freezing nominal wages (Addison, Portugal and Vilares, 2015). Indeed, the number of sector agreements also fell in a number of other countries as a result of the crisis (e.g. Belgium, the Czech Republic, France, Germany, Italy, the Netherlands, Slovenia, Spain – Visser, 2016). Yet another explanation traces the origins of the decline in sector bargaining back to the 2003 Labour Code, which introduced the possibility of expiry of collective agreements and also eliminated the principle that collective agreements could only establish more favourable conditions than those set by the general law (Távora and González, 2015).<sup>43</sup> According to this line of argument, the 2003 Labour Code significantly weakened the bargaining power of unions<sup>44</sup> which

43. The 2009 Labour Code subsequently specified a number of areas that could not be object of less favourable dispositions in collective agreements (Távora and González, 2015).

44. The 2003 Labour Code allowed employers to withdraw unilaterally from existing agreements (whereas previously, existing agreements could only be cancelled if all signatories agreed). More specifically, the 2003

translated into a low level of renewals of collective bargaining agreements during the crisis. Indeed, as Alves, Poças and Tomé (2013) show, there was a drastic fall in the number of sector agreements in 2003 (Figure 14). That being said, the same figure also shows that the number of sector agreements was already on a longer-term (albeit gradual) path of decline that started in the mid-1990s – well before the recent labour market reforms as well as the economic and financial crisis.

Figure 14. Evolution in collective bargaining, by type of agreement, 1976-2015, Portugal



Source: MSES/DGERT and Alves, Poças and Tomé (2013).

Going back to Table 2, the data also show that there has been a fall in agreements between groups of firms (*Acordos Coletivos de Trabalho*)<sup>45</sup> from 27 in 2007 to 10 in 2012, but that their number has been increasing again in recent years (23 in 2014 and 20 in 2015). Perhaps more interesting given the reforms that have taken place, the number of firm-level agreements has also fallen, from 97 in 2008 to 39 in 2012. However, their number increased to 80 in 2014 and their share of the overall number of agreements has risen from one third in 2008 to over half in 2014. However, it would be too soon to conclude that collective bargaining in Portugal is now more decentralised than it was before the crisis – especially since there was a fall again in the number of such agreements to 53 in 2015 (with their share down to 38%).<sup>46</sup> Indeed, as the next section will show, collective bargaining in Portugal generally remains very centralised.<sup>46</sup>

Labour Code specified that, following a period of unsuccessful negotiations, any party could denounce the agreement, thereby initiating a process which would culminate in its expiry (*caducidade*) if a new agreement could not be reached. One loophole left by this legislation was that agreements with a “cessation” clause (i.e. a clause which stipulates that the agreement remains in force until replaced) could still not expire. These cessation clauses were targeted by the 2009 Labour Code, which prohibited them in new agreements and put a limit on their validity in existing agreements.

45. These are agreements signed between several employers that are not part of an employers’ organisation and one or more trade unions. Such agreements are common in the financial and utilities sectors (Addison, Portugal and Vilares, 2015).
46. An alternative firm-level union strategy outside formal bargaining (the *caderno reivindicativo*) has gained importance during the crisis as collective bargaining blockages appeared at the sector level (Távora and González, 2015): “The *caderno reivindicativo* simply consists of local trade unions meeting with the workers of a firm and on their behalf approaching their employer without any formalities with the purpose of negotiating wage increases (and in some cases other terms of employment).”

*Collective bargaining coverage has fallen, but there is disagreement about how much*

There is also some disagreement as to how important the fall in collective bargaining coverage has been.<sup>47</sup> According to Addison, Portugal and Vilares (2015), the stock of workers covered by collective agreements has fallen only marginally in recent years, and still stood at 89% in 2012, primarily because many remain covered by old agreements that are still valid. Similarly, the 2014 *Quadros de Pessoal* data registers a coverage rate of 89%. However, Visser (2015) estimates that the coverage rate has fallen more drastically, from 84.9% in 2007 to 72.2% in 2013.<sup>48</sup> Visser argues that even these estimates may not be very meaningful because the wage floors fixed in older agreements may mean very little in practice as they are likely to have been overtaken by the national minimum wage. In addition, if there is no uptake in the number of new agreements very soon, then rules around the expiry of collective agreements mean that the coverage rate may fall sharply in years to come. To put things into context, however, the fall in collective bargaining coverage in Portugal is not unique and follows a more general trend observed across the OECD (Box 10).

**Box 10. The impact of the crisis on collective bargaining coverage in OECD countries**

According to the estimates by Visser (2015), the average collective bargaining coverage rate across OECD countries has declined from 53.5% prior to the crisis to 49.4% in 2013 (Figure A). While in most countries the fall in the coverage rate was relatively minor and part of a longer-term trend, a few countries have seen significant reductions in the collective bargaining coverage rate over the last few years, including: Greece (a fall of nearly 50%), Hungary and the Slovak Republic (-38%), Slovenia (-29%) and Portugal (-14%). All of these countries have pushed through significant reforms of their collective bargaining system during this period. At the same time, the figure shows that very large differences persist across OECD countries in the collective bargaining coverage rate – with nearly universal coverage in countries like Finland, Belgium, Austria and France, and rates below 20% in many of the non-European OECD countries. Despite the falls in recent years, bargaining coverage in Portugal remains significantly above the OECD average.

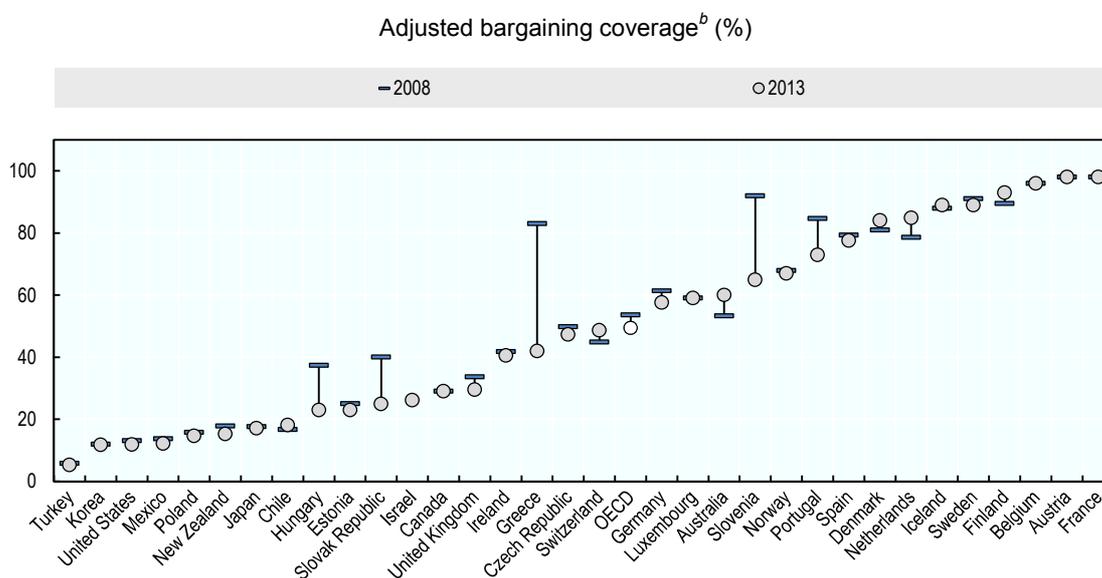
In many countries (including Portugal) low unionisation co-exists with high bargaining coverage because collective agreements are extended to the entire sector, occupation or geographical area. However, Visser (2013) argues that extending collective bargaining agreements is not the only way of obtaining high levels of bargaining coverage. In some countries (like in Scandinavia) a high bargaining coverage rate is achieved through a high level of unionisation – although this may depend on some unique features, such as union involvement in the running of unemployment insurance benefits, and/or the right to organise solidarity strikes. For example, in Denmark and Sweden, unorganised firms frequently sign “adhesion agreements” under strike pressure from unions (Visser, 2016).

Visser (2013) also argues that the key to a high bargaining coverage rate is multi-employer bargaining: for 25 European countries over the period 2000-2009 there is a strong correlation ( $r=0.8$ ) between the level of employer organisation and the bargaining coverage rate. Visser (2013) provides convincing evidence that, wherever multi-employer bargaining has been replaced by single-employer bargaining, the coverage rate has fallen significantly (e.g. Britain in the 1980s; New Zealand and Australia in the 1990s). Similarly, Visser (2016) points out that some of the greatest losses in bargaining coverage in recent years occurred in countries where important regulatory changes happened that led to a reduction in multi-employer bargaining.

*Source:* Visser, J. (2016), “What happened to collective bargaining during the Great Recession?”, *IZA Journal of Labor Policy*, Vol. 5/9.; Visser, J. (2015), ICTWSS Database, Version 5.0, Amsterdam Institute for Advanced Labour Studies AIAS; Visser, J. (2013), “Wage bargaining institutions – From crisis to crisis”, *Economic Papers*, No. 488, European Commission Directorate-General for Economic and Financial Affairs.

47. Bargaining coverage gives an indication of the extent to which workers’ wages are set by collective agreement rather than by market forces (Pedersini, 2015).
48. The level difference in Visser’s (2015) coverage rates is due mainly because of his choice of denominator, which also includes public sector workers (who are not covered by collective agreements).

## Box 10. The impact of the crisis on collective bargaining coverage in OECD countries (cont.)

Figure A. Changes in collective bargaining coverage, 2008-2013<sup>a</sup>

- a. 2005 instead of 2008 for Ireland. 2007 instead of 2008 for Denmark, Estonia, Hungary, New Zealand, Sweden and Switzerland. 2009 instead of 2008 for Chile and Norway. 2011 instead of 2008 for Mexico. 2009 instead of 2013 for Ireland. 2011 instead of 2013 for New Zealand. 2012 instead of 2013 for Australia, Estonia, France, Israel, Korea, Luxembourg, Poland and the United States.
- b. Adjusted bargaining coverage = employees covered by collective (wage) bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining, expressed as percentage, adjusted for the possibility that some sectors or occupations are excluded from the right to bargain (removing such groups from the employment count before dividing the number of covered employees over the total number of dependent workers in employment).

Source: Visser, J. (2015), ICTWSS Database, Version 5.0, Amsterdam Institute for Advanced Labour Studies (AIAS).

*There has been an important fall in the number of workers receiving contractual wage increases*

The fall in collective agreements and extensions led to a significant fall in the number of workers receiving pay rises as a result of such agreements: from 1.7 million in 2008 to less than 200 000 in 2013 (Table 3). Even among the workers benefiting from pay rises, however, those were often small and, in 2011 and 2012, not sufficient to beat inflation (i.e. wages declined in real terms). In Chapter 2 of this report, these wage developments (and their impact on Portugal's competitiveness) will be analysed in further detail.

Table 3. Annual changes in contractual wages, 2008-2015

	2008	2009	2010	2011	2012	2013	2014	2015
Number of workers affected	1 704 107	1 303 457	1 294 570	1 202 908	306 187	186 581	213 738	495 059
Nominal change from previous period (%)	3.1	2.9	2.4	1.5	1.4	1.0	1.0	0.7
CPI change from previous period (%)	2.6	-0.8	1.4	3.7	2.8	0.3	-0.3	0.5
Real change (%)	0.5	3.7	1.0	-2.2	-1.4	0.7	1.3	0.2

Note: Contractual wages are those wages set by collective agreement.

Source: MSESS/DGERT and OECD Employment Outlook database (for CPI data).

### *The Portuguese collective bargaining reforms from an international perspective*

Reforms of collective bargaining institutions of the type implemented in Portugal over the past few years are not unique, and similar changes have been introduced in other countries at the same time (e.g. in Greece, Spain, Ireland). While many of the reforms in those countries were quite substantial and often carried out under pressure from international finance institutions, they frequently resulted in a mere catch-up process with other countries where similar changes had already occurred, albeit more gradually and over a longer period of time (Eurofound, 2015). In particular, one can observe a general, longer-term trend across OECD countries in terms of: the decentralisation of collective bargaining; a reduction in the use of administrative extensions; and limits placed on the time validity of agreements. The need for such changes has been attributed to globalisation and increased competition from abroad, which mean that individual firms need more flexibility to adjust labour costs and productivity in order to respond to changes in market conditions.<sup>49</sup> Moreover, many commentators agree that such trends are likely to continue for the foreseeable future (Visser, 2013; Eurofound, 2015). While this sub-section argues that the recent reforms in Portugal followed a more general trend across OECD countries, the analysis will also show that, compared to many other countries, Portugal's wage bargaining system remains highly centralised and that there has not yet been a strong shift towards firm-level agreements (in contrast to what happened in Greece and Ireland, for example).

#### *Decentralisation*

Visser (2015) constructs a summary measure of the extent of decentralisation of collective bargaining which considers simultaneously: the predominant level at which bargaining takes place;<sup>50</sup> the frequency or scope of additional enterprise bargaining; the possibility of opening clauses in collective agreements; the extent of articulation of enterprise bargaining; and the possibility of derogation.<sup>51</sup> The evolution of this indicator over time is shown in Figure 15, which shows that there has been a clear trend across the OECD towards decentralisation.<sup>52</sup> In most countries, this had been happening well before the recent economic and financial crisis, but in Greece, Portugal and Spain the changes are more recent.

While the indicator suggests that Portugal's collective bargaining system has become more decentralised, the main driver of this change is the 2009 change to the Labour Code which introduced the possibility of firm-level agreements. However, as argued above, there has not (yet) been a strong shift towards firm-level agreements in Portugal – a finding which is confirmed in Figures 16 and 17, which show that the dominant level of bargaining in Portugal remains the sectoral level, while additional enterprise bargaining on wages is still rare, even in large firms. The experience in Portugal during the recent crisis stands in stark contrast to what happened in Greece and Ireland, where multi-employer bargaining “all but disappeared” during the recession (Figure 16 and Visser, 2016). Even amongst

49. One argument for multi-employer bargaining has been that, by establishing a wage floor across all employers in the same sector, it takes wages out of the equation as far as competition is concerned. However, with increasing competition from abroad, this argument loses a lot of its strength.

50. A particular level is dominant if it accounts for at least two-thirds of bargaining in terms of employees covered.

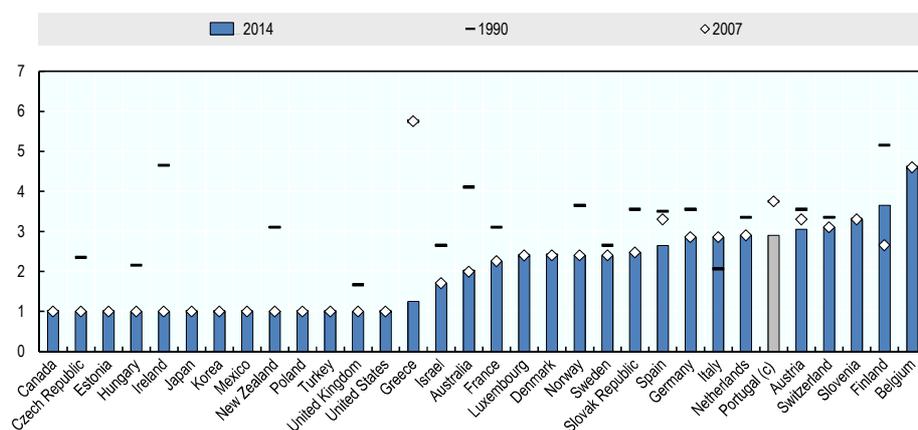
51. Visser (2015) defines derogation as “the possibility of setting aside the favourability principle in higher-order (usually sector) agreements, allowing deviation from norms established in the higher-order agreement that in some aspects are less favourable, possibly in exchange for some other guarantees or benefits.”

52. The trend towards increased decentralisation has often been based on the argument that decentralised collective bargaining systems achieve better macroeconomic outcomes that are closer aligned to those that would have been achieved through market forces. However, it has also been argued that similar macroeconomic outcomes can be achieved by highly centralised bargaining systems, as long as there is a high level of co-ordination and a responsible attitude on the part of unions (Pedersini, 2015). In particular, highly centralised wage bargaining institutions need to concentrate on objectives that are in the interest of as many of their members as possible and can, therefore, “promote low structural unemployment and mitigate the direct impact of shocks on employment” (OECD, 2014a).

countries where sector bargaining remained the dominant level, there has been a move to more frequent bargaining at the firm level. In Austria, for example, employers in the metal-engineering industry left the joint bargaining platform in 2012 and signed separate agreements (Visser, 2016).

Figure 15. Centralisation of wage bargaining, 1990-2014<sup>a</sup>

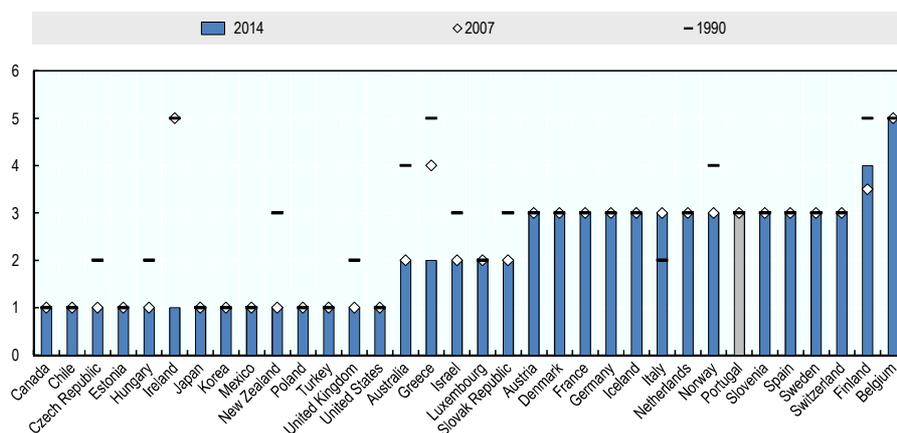
Index of centralisation of wage bargaining<sup>b</sup>



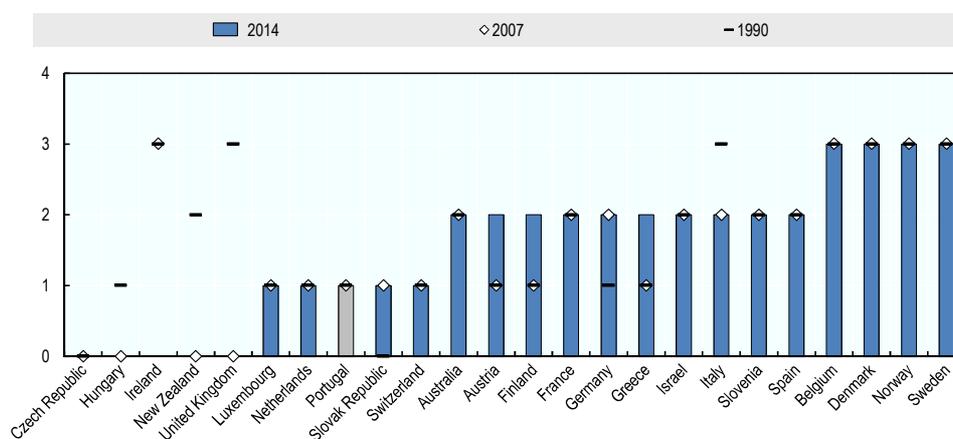
- 1991 instead of 1990 for the Czech Republic, Estonia and Portugal. 1993 instead of 1990 for the Slovak Republic.
- The index is calculated as:  $LEVEL - (fAEB + OCG) / 4 (= \text{max value}) + (Art + DR - 1) / 5 (= \text{max value})$ . Where: LEVEL = the predominant level at which wage bargaining takes place; fAEB = frequency or scope of additional enterprise bargaining; OCG = general opening clauses in collective agreements; Art = articulation of enterprise bargaining; DR = derogation. For further detail on how these variables are defined, see Visser (2015).
- The 2014 estimate for Portugal differs slightly from that in Visser (2015) because, following discussions with the author, "derogation" has been coded as 2 (i.e. favourability principle is anchored in law, derogation possible under conditions) instead of 0 (i.e. favourability is inversed, enterprise agreements favoured over higher-order agreements).

Source: Visser, J. (2015), ICTWSS Database, Version 5.0, Amsterdam Institute for Advanced Labour Studies AIAS.

Figure 16. The predominant level<sup>a</sup> at which wage bargaining takes place, 1990-2014<sup>b</sup>



- 5 = bargaining predominantly takes place at central or cross-industry level and there are centrally determined binding norms or ceilings to be respected by agreements negotiated at lower levels;
  - 4 = intermediate or alternating between central and industry bargaining;
  - 3 = bargaining predominantly takes place at the sector or industry level;
  - 2 = intermediate or alternating between sector and company bargaining;
  - 1 = bargaining predominantly takes place at the local or company level.
- 1991 instead of 1990 for the Czech Republic, Estonia and Portugal. 1993 instead of 1990 for the Slovak Republic.
- Source: Visser, J. (2015), ICTWSS Database, Version 5.0, Amsterdam Institute for Advanced Labour Studies AIAS.

Figure 17. Frequency or scope of additional enterprise bargaining<sup>a</sup>, 1990-2014<sup>b</sup>

- a. 3 = additional enterprise bargaining on wages is common;  
 2 = additional enterprise bargaining on wages occurs only in large firms;  
 1 = additional enterprise bargaining on wages is rare even in large firms;  
 0 = no additional enterprise-level bargaining on wages (or does not apply, if “level”=1).
- b. Canada, Estonia, Japan, Korea, Mexico, Poland and United States are not included because bargaining in those countries predominantly takes place at the local or company level over the entire period under consideration.

Source: Visser, J. (2015), ICTWSS Database, Version 5.0, Amsterdam Institute for Advanced Labour Studies AIAS.

The move towards decentralisation in many OECD countries is closely connected to the increased possibility of opening clauses – i.e. the ability to set aside the legal favourability principle which dictates that collective agreements can only deviate from the law (and that lower-level agreements can only deviate from higher-level agreements) in ways that are favourable for workers (Visser, 2013). In Portugal, collective agreements have been able to establish less favourable conditions than those prescribed by the law since the introduction of the Labour Code in 2003 (although, in 2009, the revised Labour Code then specified a number of areas that could not be object of less favourable dispositions in collective agreements), while firm-level agreements (in firms with 500 or more employees) have been able to deviate from higher-level agreements in a less favourable way since 2009. As discussed above, this possibility was extended to firms with 150 or more employees in 2012. In most other OECD countries where the predominant level of bargaining is at the sector/industry/national level, the widespread use of opening clauses in collective agreements only began at the beginning of this century (Visser, 2013) – although in a few countries, this is a far more recent phenomenon (e.g. Finland, Greece, Italy and Spain).

Opening clauses as discussed in the previous paragraph need to be distinguished from “inability-to-pay” (or “hardship”) clauses, which have also been on the rise across the OECD, and which allow temporary deviations from higher-level agreements for firms facing economic difficulties. As discussed above, Portugal introduced this possibility in 2014. Similarly, such clauses have been used by many other OECD countries during the recent crisis (e.g. Austria, Finland, Greece, Norway, Poland, Sweden, Slovenia and Spain). In a handful of countries, they were possible even before the crisis, though sometimes only informally (at least to start with). In Germany, for example, informal arrangements between works councils and employers which allowed deviations from collective agreements in order to save jobs started emerging in the 1990s, and were later institutionalised.

### *Extensions*

The extension of collective bargaining agreements is legally possible in around two thirds of OECD countries. The exceptions are: Canada,<sup>53</sup> Denmark, Greece (since 2011), Italy,<sup>54</sup> Mexico, New Zealand, Sweden, Turkey,<sup>55</sup> the United Kingdom and the United States. In the United Kingdom and New Zealand, extensions used to be possible, but were removed in the early 1980s and 1990s, respectively. While the advantages of extensions for non-unionised employees are obvious, employers may also have an interest in having collective agreements extended because it tends to remove competition on the basis of working conditions (including wages). In addition, extension practices may be particularly useful in countries where there are a large number of small firms (for whom the transaction costs of bargaining are too high) and may even act as an incentive for employers to join an employer organisation in order to get their voice heard.<sup>56</sup> However, as argued above, extensions may also have important negative consequences in terms of competitiveness and employment.

Amongst the countries where extensions are possible, important differences exist in terms of: i) how common such extensions are; ii) whether extensions apply to the whole (or only a part) of the agreements; and iii) what specific requirements need to be fulfilled for an extension to be granted. In some countries (including Portugal before the crisis), extensions are quasi-automatic and apply to virtually all agreements. These countries are: Austria, Belgium, Finland, France, Greece (before 2011), Slovenia and Spain. In other countries, there is a much more selective use of extensions. In Ireland, for example, extensions are only applied to wages and working conditions, and similar restrictions exist in Germany and in Norway also. Finally, in many countries specific requirements need to be met (often relating to the representativeness of the employers signatory to the agreement – i.e. the percentage of workers they represent) before an extension will be granted. Most commonly, the representativeness threshold is set at around 50%: e.g. Finland, Germany (until recently), Greece and Spain (for some procedures). In other countries, the thresholds can be lower (e.g. 30% in Switzerland in some sectors) or higher (60% in the Netherlands, or lower under certain conditions). Clearly, the right rule and threshold need to be adapted to the economic realities of each country.

The crisis brought about important changes to the practice of extensions in many countries, not just in Portugal. In some, extensions were temporarily suspended – sometimes deliberately (like in Greece), sometimes as a result of legal uncertainty (e.g. Ireland and the Slovak Republic). Estonia made a deliberate choice to drop automatic extensions, while the Czech Republic introduced the possibility of exemption for SME's and firms facing financial difficulties.

Interestingly, not all OECD countries decided to weaken the practice of extensions. In the Netherlands, for example, the government made it more difficult for firms to obtain an exemption from extensions, while in Germany the representativeness threshold for extensions to be granted was lowered. That being said, there are few countries where the number of extensions has increased over time – Germany, Norway and Switzerland being the only three exceptions (but these are countries where extensions were relatively rare or non-existent in the past – Eurofound, 2015). Overall, therefore, the practice of extending collective agreements has become less common during the crisis in OECD countries.

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53. With the exception of Quebec.

54. In Italy, the courts tend to uphold minimum wage claims based on sectoral agreements for uncovered workers performing similar work, which serves as a functional equivalent to the practice of extension.

55. While there is an instrument for extension of collective agreements in Turkey, it is rarely used in practice (Uçkan, 2012).

56. On the other hand, extensions may reduce union membership as non-unionised workers are able to free-ride on the outcomes of bargaining rounds without having to pay a union membership fee (Blanchard, Jaumotte and Loungani, 2013).

Sometimes, this was as a result of temporary measures, but some countries have introduced permanent restrictions on the use of extensions. While there are obvious reasons for refraining from quasi-automatic extensions during times of crisis, it remains to be seen how the practice will evolve once countries return to higher rates of growth.

#### *Termination and continuation beyond expiry*

Until recently, collective agreements in a handful of countries (primarily in Southern Europe) would not expire unless they were replaced by new ones. The reasoning behind such rules is that they protect workers in cases where employers are unwilling to negotiate new terms. However, because they significantly strengthen the bargaining power of unions, such rules also make it much more difficult for employers who, during times of crisis, may need to negotiate less favourable terms in order to survive and/or avoid employment losses.

While Portugal already introduced the possibility of expiry of agreements without replacement in 2003<sup>57</sup> (and further reduced the length of time for which agreements with cessation clauses could remain valid during the recent reform period), Greece, Spain and Estonia only followed suit during the crisis. In Greece, the indefinite duration of collective agreements (*metenergeia*) was scrapped and replaced by a period of validity of between one to three years, while the after-effect period of agreements was reduced from six to three months. Upon expiry, all clauses of the agreement will cease to apply, except those on basic salary and allowances for maternity, children, education, and hazardous work. Similarly, the Spanish Government put an end to the practice of *ultra-actividad* in 2012, and the after-effect of collective agreements is now limited to one year. In the same year, Estonia removed the possibility of automatic continuation after expiry, and agreements can now only remain valid beyond expiry upon agreement between the signatory parties. Another practice which has emerged in some countries is to allow collective agreements to be terminated unilaterally by one of the signatory parties, like in Poland in 2002 (Eurofound, 2015; Visser, 2016). Overall, and despite the recent reforms, the legal requirements for the expiry of collective agreements remain more demanding and the minimum periods longer in Portugal than in other European countries (Naumann, 2014).

#### **Additional wage moderation was achieved by freezing the minimum wage and reducing overtime pay**

In a bid to restore competitiveness and save jobs, the government froze the minimum wage between 2011 and 2014, and cut the pay (and other compensation) for overtime work. In addition, attempts were made at cutting public sector wages, although the Constitutional Court blocked many of these cuts. These measures came on top of the reduction in collective agreements and extensions discussed above. As the next chapter will make clear, all these measures helped achieve some wage moderation during the crisis.

#### ***The minimum wage was frozen***

Traditionally updated in January of each year, the Portuguese minimum wage (*Retribuição Mínima Mensal Garantida*) was frozen at its January 2011 level of EUR 485 until October 2014, when it was increased to EUR 505. While the real minimum wage had been relatively stable prior to the crisis, it increased rapidly in the early stages of the recession (2008-2010). The freezing of the minimum wage in 2011 led to a slow erosion of its real value, but the 2014 increase brought the minimum wage back to a real level comparable to that observed at its peak in 2010 (Figure 18).

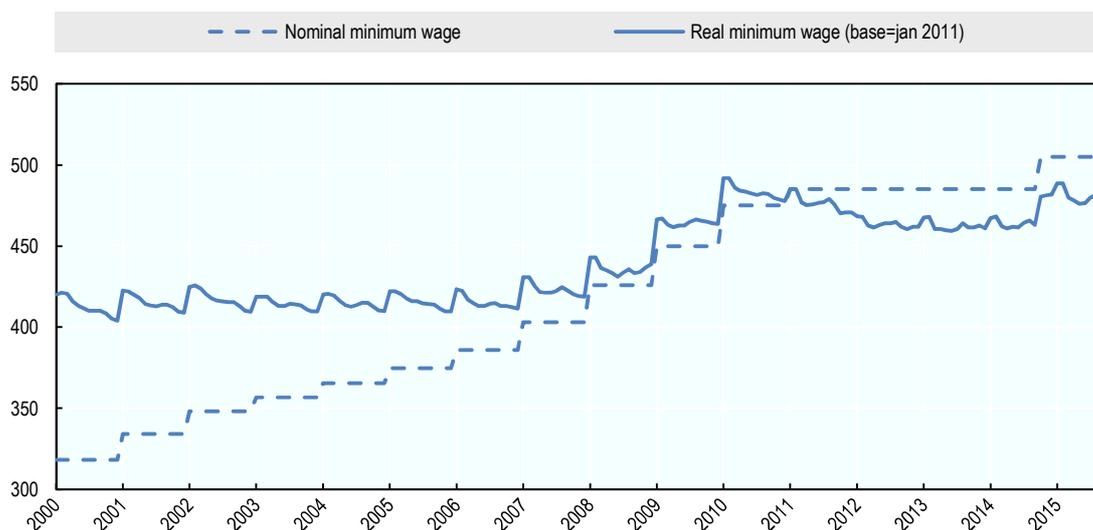
On average across the OECD, minimum wages rose as a proportion of median wages during the crisis – from 47.3% in 2007 to 50.2% in 2014. In Portugal, this increase was even greater (from 51.4% to 57.5%) and, in 2014, Portugal had the sixth highest minimum wage relative to median wages among all OECD

57. The 2006 revision of the Labour Code added an important rule which was that, if the signatories did not specify which conditions of the agreement was to transfer to the individual work contract upon expiry, then provisions related to pay, category and function would automatically be transferred (Naumann, 2014).

countries. Only Turkey, Chile, France, Slovenia and New Zealand had a higher minimum-to-median-wage ratio (Figure 19). While the cost to employers of the 2014 increase in the minimum wage was somewhat offset by a temporary<sup>58</sup> decrease of 0.75 percentage points in employer social security contributions on minimum-wage workers who were hired prior to June 2014, it is important to highlight that, in general, Portugal imposes relatively high employer social security contributions on minimum-wage workers compared to other countries in the OECD (OECD, 2015c). This will exacerbate the possible negative effect of a high minimum-to-median-wage ratio on employment.<sup>59</sup>

From the point of view of employees, however, Portugal imposes relatively low income taxes and social contributions, so that households pocket a large share of any increase in the minimum wage (much larger than in most other OECD countries; OECD, 2015c). At the same time, the freezing of the minimum wage has hurt workers and, in 2013, OECD analysis shows that minimum-wage workers needed to work a relatively high number of hours to be able to move above the relative poverty line: a lone parent with two children needed to work 50 hours per week at the minimum wage before earning 50% of median net household income, while one-earner couples with two children needed to work 62 hours to achieve the same (OECD, 2015c).

Figure 18. **Nominal and real levels of the Portuguese minimum wage, January 2000 to September 2015**



Note: Real minimum wage obtained using the monthly Consumer Price Index; base= January 2010.

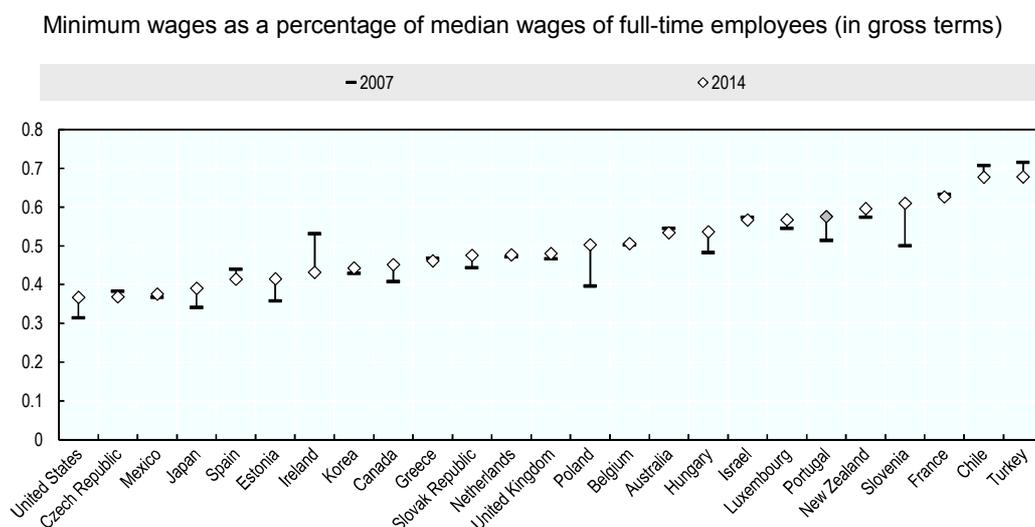
Source: OECD Minimum Wage Database and OECD Economic Outlook Database.

In conclusion: while recent increases in the minimum wage are to be welcomed from a worker perspective, they should raise some concern for employers, particularly because employer taxes and social security contributions on minimum-wage workers are relatively high in Portugal.

58. This measure was set to expire in January 2016.

59. Two studies have shown that minimum wages have (small) negative effects on employment in Portugal (Centeno, Duarte and Novo, 2011; Carneiro et al., 2011). These findings are consistent with the wider, international evidence which has shown that moderate increases in a moderate minimum wage are unlikely to have significant negative employment effects – although more vulnerable groups might be slightly more adversely affected (OECD, 2015c).

Figure 19. Minimum wage levels pre- and post-crisis, 2007-2014



Note: Countries are ranked in ascending order of the MW/Median ratio in 2013. 2009 instead of 2007 data for Mexico. 2013 instead of 2014 data for Japan and Korea.

Source: OECD Minimum Wages Database.

### *Compensation for overtime work was reduced*

Most countries across the OECD regulate standard workweek hours and have laws in place that dictate additional compensation for overtime work. The primary motivation for such legislation is to protect workers' safety and well-being. In addition, some analysts believe that restrictions on overtime work could promote employment: by reducing the number of hours worked by each individual worker, regulations on overtime force employers to hire new workers instead. However, the evidence does not support this claim. If anything, it has been found that greater restrictions on overtime work (including higher overtime premia) raise labour costs and result in a reduction in overall employment (Oaxaca, 2014).<sup>60</sup> While seemingly counterintuitive, there are various reasons why reductions in the number of overtime hours will not create additional employment. One of these is that overtime tends to be carried out primarily by skilled workers, and such work cannot easily be done by unskilled workers. Another reason is that restricting overtime work induces workers affected by such measures to look for second jobs, which creates additional competition for existing jobs. Finally, if jobs consist of a given package of compensation and working conditions, then reductions in overtime pay could simply be compensated for by increases in other types of pay (base wages or other pay) (Trejo, 1991).

In a bid to reduce wage costs, Portugal cut compensation for overtime work by half and revoked the right to paid compensatory time off. In addition, the government suspended until the end of 2014 all clauses regarding overtime pay and compensatory time off contained in collective agreements and employment contracts. Finally, by promoting the use of working time accounts (see next section), employers were offered a cheaper alternative to using overtime work.

60. Similarly, experiments with work-sharing in a number of European countries during the 1980s and 1990s – based on the belief that reducing the average number of hours worked by each employee would result in the creation of new jobs – have not resulted in any employment effects. If anything, the employment effects of such schemes have been negative (Kramarz et al., 2008; Andrews et al., 2015).

Cuts to overtime pay were controversial, especially since they resulted in reductions in earnings for some workers highly dependent on overtime hours. Távora and González (2015) show how some employers kept paying overtime at the pre-reform rates, in return for other concessions from workers. Indeed, new evidence produced by the OECD suggests that there may have been some compensation for cuts in overtime pay through greater increases in base wages and/or in hours worked (see Box 11). At the same time, there is little evidence that the reduction in overtime pay may have reduced employment growth. If anything, there might have been more employment growth in firms that increased their use of overtime.<sup>61</sup> This is because, as argued in Box 11, the main driver of overtime use (and employment growth) is firm performance, and not the rate at which overtime is paid. In a way this is not surprising given that overtime pay actually represents a very small portion of firms' overall wage bill (see Box 14 in Chapter 2).

#### Box 11. Overtime pay rates, overtime use, and employment growth following the reform of overtime

This box uses data from the *Quadros de Pessoal* to analyse the effects of the change to overtime compensation on overtime pay rates, the use of overtime, employment growth, hours worked, and other wages. All results are for the private (non-agricultural) sector.

##### Hourly overtime compensation fell

The reforms of overtime compensation had a significant impact on hourly overtime pay rates in Portugal which, between 2011 and 2012, fell by 16.7% (13.4%) among workers working (firms using) overtime. While 79.4% (74.4%) of employees (firms) who worked (used) overtime in both 2011 and 2012, saw a reduction in their hourly overtime compensation, only 13.7% (21.8%) experienced an increase. The decision to reduce overtime pay rates appears to have been influenced by firm performance: among firms that did not reduce overtime pay rates, turnover increased by 5.6% on average (compared to just 2.3% among firms that reduced overtime pay rates).

##### The use of overtime decreased as well

Despite the strong reductions in hourly overtime compensation, the use of overtime did not increase. Before the reform, 7.6% (3.6%) of employees (firms) worked (used) overtime, while after the reform the incidence of overtime was 6.3% (3.4%) among employees (firms). Similarly, the average monthly number of overtime hours per employee was 1.20 prior to the reform, and 1.07 after.

The reduction in the use of overtime is not surprising, given that the reform was introduced at the trough of the recession, when demand was low and employers were shedding workers rather than needing more of their time. In addition, the reform coincided with the introduction of the individual working time accounts, which may have reduced the use of classic overtime work. While some firms did increase their use of overtime, this was generally because they were performing well: 41.5% of firms that increased their use of overtime experienced an increase in turnover, compared to 28.3% of firms reducing their use of overtime. It is also not the case that firms that started using more overtime were more likely to cut overtime pay rates: regardless of whether they increased or reduced overtime use, 75% of firms on average lowered the hourly overtime rate.

##### There is no indication that the reform harmed employment growth

A key concern is that, by reducing the cost of overtime, the reform may have hampered the creation of new jobs. This might be particularly true in a recovery, when demand is picking up but firms are still uncertain about future growth and prefer to use existing employees more, rather than risking to take on new ones. That being said, if the overtime wage rate is reduced and firms do not increase hours worked in response, then the savings obtained might be reinvested by firms into hiring new employees – and so the employment effect of the cut in overtime compensation could in fact be positive.

The data do not indicate that there was any substantial substitution of overtime use for employment growth. In fact, firms that both cut their overtime pay rate and increased the use of overtime also had larger employment growth than average (6.1% versus 0.2%). Just as with the use of overtime, the primary determinant of employment growth is firm performance: employment grew 10.5% in firms where turnover increased, while it fell by 4.3% in the other firms.

61. Martins (2016a) also finds that firms that cut overtime premiums experienced greater increases in employment.

**Box 11. Overtime pay rates, overtime use, and employment growth following the reform of overtime (cont.)**

**Cuts in overtime pay rates were compensated for by increases in hours worked and/or other wages**

Another interesting (and related) question is whether any reductions in hourly overtime pay were compensated for by increases either in other types of pay, or in the number of hours worked. Indeed, the reform was controversial as it reduced the incomes of certain employees who heavily relied on overtime work, and there is anecdotal evidence that some firms compensated the reduction in overtime pay for those workers by increasing their base wage. The Portuguese *Quadros de Pessoal* data show that the hourly wages (excluding overtime) grew slightly more for employees who experienced a drop in their overtime wage rate (0.48% versus 0.36%). Similarly, the probability of an increase in total hours worked (including overtime) was significantly greater for employees who had their overtime pay rate cut (41.8% compared to 11.6% on average). These figures indicate that the impact of the reduction in the overtime pay rate on total pay was mitigated through increases in both other wages and hours worked.

The above results (i.e. that the reduction in overtime pay rates was not associated with an obvious increase in the use of overtime or decrease in employment growth – and that there was some compensation for the losses in overtime pay by increases in other wages and hours worked) are not entirely surprising, given that total overtime pay only represents a very small fraction of firms' average wage bill per employee (see Box 14 in Chapter 2 for further detail).

***Public sector wages were cut***

In addition to freezing the minimum wage, the government cut the wages of civil servants earning more than EUR 1 500 in 2011 (by 3.5% to 10%). It also attempted to further cut public sector wages by: i) suspending the 13<sup>th</sup> and 14<sup>th</sup> monthly salary payments for those workers earning EUR 1 100 or more per month; ii) suspending the equivalent of one of those payments for workers with monthly salaries between EUR 600 and EUR 1 100. However, Portugal's Constitutional Court ruled that these cuts were unconstitutional and that the payment of bonuses should be resumed in 2013. These cuts were nevertheless implemented in 2012. In addition, in 2013, the government increased the working hours of public sector workers from 35 to 40 hours per week, without any increase in pay.

The government reintroduced similar public sector wage cuts, albeit more significant and also for civil servants earning below EUR 1 500 per month, as part of its 2014 Budget Law. Once more, these cuts were ruled unconstitutional (in May 2014) and were only implemented in the first five months of 2014. Other provisions contained in the 2014 Budget Law with an impact on public sector wages (such as overtime pay reductions and uncompensated longer work weeks) were not challenged. Given that the ruling of the Constitutional Court had severe implications for public finances, the government launched a new austerity package in 2014, which again cut public sector wages over the period 2014-2018 at rates comparable to those applied in 2011. These measures were immediately brought before the Constitutional Court (August 2014), which ruled that the cuts for 2014 and 2015 were constitutional, but that it was not acceptable to implement wage cuts for a more extended period than the one fixed for the implementation of the Memorandum of Understanding on Specific Economic Policy Conditionality, which lasted until May 2015.<sup>62</sup>

62. The XXI Constitutional Government reversed previous cuts in public sector wages by the end of 2016, and returned from the 40-hour week introduced in 2013 to the old 35-hour week in July 2016.

### ***Working time has become more flexible to contain employment fluctuations over the cycle***

Adjustments in labour input in response to adverse conditions can happen either along the extensive margin (i.e. reducing the number of people in work) or along the intensive margin (i.e. reducing the hours of people in work). Avoiding unnecessary redundancies is obviously preferable from the employees' point of view, but also for employers because it allows them to hold on to employees (and firm-specific human capital) and avoid costly hiring and firing procedures. From society's perspective, it mitigates the costs of higher unemployment, including expenditure on unemployment benefits.

In contrast to some other OECD countries, the adjustment in labour input to the crisis in Portugal occurred primarily through job destruction. There are many factors which determine the choice of adjustment mechanism (hours versus jobs), but making sure that employers have the flexibility to adjust working time is one of them. In particular, there is evidence that short-time work compensation schemes helped preserve jobs in a number of OECD countries during the crisis (OECD, 2010b). In addition, working time accounts played an important role in countries such as Germany.

Such schemes existed in Portugal prior to the crisis, but the evidence suggests that they were used very little. To encourage employers to use such measures in the future, Portugal reduced the procedural requirements and time needed to implement short-time work compensation schemes (*redução temporária do período normal de trabalho ou suspensão do contrato de trabalho*), and also introduced additional safeguards to reduce the deadweight loss incurred by them. In addition, individual working time accounts (*banco de horas*) were introduced alongside the collective working time accounts already in place, and it was made easier to extend the latter to workers not covered by collective agreements.<sup>63</sup>

While there appears to have been a slight uptake of short-time work and working time accounts following the reforms, this probably came too late to make a significant difference to job destruction during the recent recession. In addition, and despite the reform, the take-up of flexible working time arrangements may remain low in Portugal as long as there is a high share of temporary employment, which makes it easy for firms to adjust labour inputs along the employment margin.

### ***In Portugal, the adjustment in labour input to the crisis occurred primarily through job destruction***

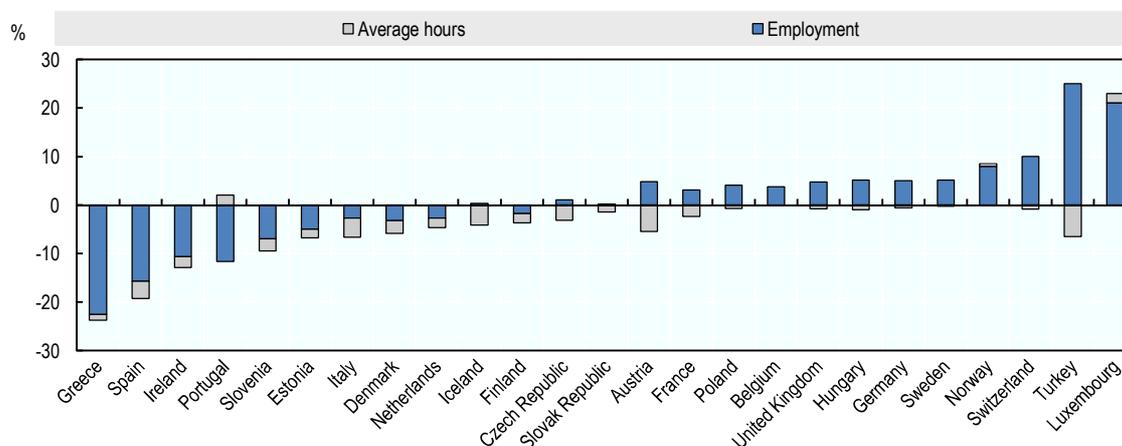
A decomposition of the reduction in total hours worked during the crisis shows that, in Portugal, this fall can be attributed entirely to employment losses,<sup>64</sup> while in other countries a reduction in average hours worked played a more important role (Figure 20). OECD (2010b) showed that, in some countries, the decline in employment during the crisis was small compared to what would have been expected given the size of the decline in output, and that this was due in large part to reductions in average hours worked.

63. The XXI Constitutional Government has announced plans to abolish the possibility of individual working time accounts established upon agreement between the employer and employee. Instead, there would be a return to the pre-reform situation where such working time accounts could be established only by collective agreement (Government of Portugal, 2015).

64. One of the contributing factors to these employment losses is the fact that a very large share of Portugal's businesses is made up of micro/small enterprises, with low survival rates during times of crisis. Indeed, Carneiro, Portugal and Varejão (2014) show that the closing of existing firms contributed significantly to overall employment losses.

Figure 20. Decomposition of the change in total hours worked, 2007-2014

Change in total hours worked that can be attributed to changes in employment and average hours worked, respectively



Note: Countries are ranked in ascending order of the percentage change in total hours worked. Covers all ages 15+. Because of a methodological change in the Portuguese Labour Force Survey, data prior to 2011 are not fully comparable with the more recent data. The new methodology results in higher levels of unemployment and inactivity compared to the methodology used prior to 2011. For detailed information, see Statistics Portugal (2011).

Source: Eurostat.

### ***In some countries, short-time work compensation and working time accounts played an important role in preserving jobs during the crisis***

There are many factors that determine the extent to which labour input adjustments are made along the intensive margin (hours worked) as opposed to the extensive margin (employment) – including differences in the nature of the shock and the structure of the economy. However, making sure that employers have the flexibility to adjust working time in response to changing demand conditions is one of those reasons.

For example, there is evidence that short-time work compensation played an important role in preserving jobs during the crisis in a number of OECD countries, including in Germany, Japan, Belgium and Finland (OECD, 2010b). Convincing employees to reduce working time during a crisis may be difficult for employers since it implies a significant loss in earnings. If, however, the government compensates some of that loss and ensures that employees still earn more than they would receive in unemployment benefits, they might be more easily persuaded. While such publicly sponsored schemes to support temporary reductions in working time or lay-offs were possible in Portugal even prior to the crisis (*redução temporária do período normal de trabalho ou suspensão do contrato de trabalho*), they appear to have been rarely used (MTSS 2006). In comparison, countries which experienced a fall in GDP in 2009 similar to that of Portugal (e.g. Austria, the Netherlands, Switzerland and the United States) had much greater incidence of short-time workers in the labour force (see Figure 21).

Similarly, there is evidence that working time accounts (or banks) have helped preserve jobs during the crisis in countries like Germany (Zapf and Brehmer, 2010). These schemes allow employers to increase hours worked (within certain limits) when demand is high, and then to run down the accumulated time when demand is low. Again, while such flexibility has been available to employers in Portugal since 2009, it has been used relatively little in practice (Monteiro Fernandes, 2012).

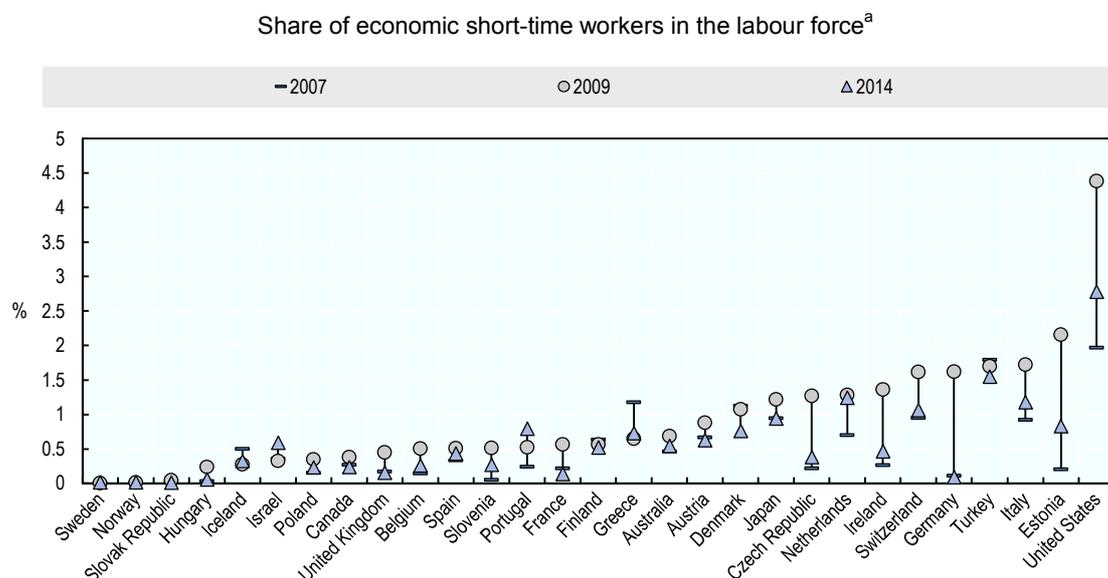
### *Portugal introduced a number of reforms to facilitate the use of flexible working time arrangements*

Towards the middle of 2012, Portugal introduced a number of changes that would make it easier for employers to use short-time work compensation as well as working time accounts. The procedural requirements and time needed to implement short-time work arrangements were reduced. In particular, the notice period employers need to respect to inform workers of the measure to be applied was shortened (with a possibility to implement immediately if the works council agrees), and the workers' representative body can no longer oppose an extension of the short-time working arrangement as long as the employer follows the necessary communication procedures.

A second reform involved the introduction of individual working time accounts alongside the collective working time accounts already in place, and it was made easier to extend the latter to workers not covered by collective agreements. Under the previous rules, working time accounts had to be regulated by collective agreement. As pointed out by Távora and González (2015), the new rules therefore decentralised decisions around internal flexibility to the firm.

Figure 21 suggests that the share of economic short-time workers in Portugal has increased over time. Interestingly, Portugal is one of the only countries where the use of short-time work has risen between 2009 and 2014, which could reflect the fact that such measures are now easier to implement. In most other countries, the peak was reached in 2009, and there was a substantial reduction in the use of short-time work by 2014. While international comparative data is not available, Table 4 shows that the number of workers covered (firms using) working time accounts in Portugal was 2.5 (1.3) times higher in 2014 than it was in 2010. That being said, the proportion using working time accounts remains relatively low (2% of workers and less than 1% of firms). In addition, because these reforms came so late in the crisis, it is highly unlikely that they will have had a significant impact on stemming job losses. As Chapter 2 will show, Portugal started emerging from the crisis in early 2013.

Figure 21. **The incidence of short-time workers, 2007-2014**



- a. Persons working less than usual during the survey reference week due to slack work for technical or economic reasons or to change of job during reference week – i.e. start or end of job without taking up a new one.

Source: OECD Employment Database.

Table 4. Use of working time accounts, 2010-2014

		Number					Percentage (%)				
		2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
	<b>Total</b>	<b>14 015</b>	<b>15 581</b>	<b>30 817</b>	<b>42 481</b>	<b>49 132</b>	<b>0.53</b>	<b>0.60</b>	<b>1.26</b>	<b>1.75</b>	<b>1.96</b>
Workers	Working-time account (collective)	14 015	15 581	17 710	25 274	28 975	0.53	0.60	0.73	1.04	1.16
	Working-time account (individual)			11 307	15 103	17 951			0.46	0.62	0.72
	Working-time account (group)			1 800	2 104	2 206			0.07	0.09	0.09
	<b>Total</b>	<b>1 032</b>	<b>1 087</b>	<b>1 534</b>	<b>1 956</b>	<b>2 362</b>	<b>0.36</b>	<b>0.38</b>	<b>0.56</b>	<b>0.72</b>	<b>0.86</b>
Firms	Working-time account (collective)	1 032	1 087	1 189	1 426	1 542	0.36	0.38	0.43	0.52	0.56
	Working-time account (individual)			339	524	700			0.12	0.19	0.25
	Working-time account (group)			61	105	120			0.02	0.04	0.04

Source: Gabinete de Estratégia e Estudos, Ministry of Economy (based on the *Quadros de Pessoal*).

**Portugal also improved the design of short-time work compensation schemes to reduce their deadweight loss**

While the majority of OECD countries operated a short-time work compensation scheme during the crisis, OECD (2010b) showed that there are important differences in the design of such schemes across countries which may affect their relative success at stemming job losses. In particular, such design features can influence: i) the amount of deadweight loss such schemes incur (i.e. the subsidisation of jobs which would have been kept even in the absence of the subsidy) as well as ii) their displacement effects (i.e. the preservation of jobs that are not viable without the subsidy, even after business conditions improve). Among the main characteristics of short-time work schemes OECD (2010b) distinguishes:

- *Work-sharing requirements* which specify how working time reductions are to be distributed across the workforce of participating firms, including by setting a minimum number or share of employees who must participate, or limits on the minimum or maximum hours reductions.
- *Eligibility requirements* which set conditions that employers or employees must meet in order to participate in the programme (e.g. minimum reduction in production and/or sales; or an explicit agreement between the social partners).
- *Conditionality requirements* which set behavioural requirements for employers and employees participating in short-time work schemes (e.g. prohibitions of dismissals during or, in some cases, for a short period after participation in short-time work schemes; the development of recovery plans).
- The *generosity* of a short-time work programme which determines the cost of participation for both firms and employees, as well as the maximum duration for which income support is available.

As part of the reform of short-time work compensation, Portugal attempted to reduce the deadweight losses of such schemes by: imposing a 30% contribution of the employer to the financial compensation paid to the worker; providing financial incentives to encourage workers to take up training while not working; and banning firing in the period immediately after the end of the scheme. While these requirements and the generosity of short-time work schemes can be tightened so as to reduce deadweight losses and displacement effects, it is important to bear in mind that there is also an important trade-off in terms of the uptake of such schemes: the higher the administrative burden placed on firms, the higher the probability that the latter will be deterred from participating in them.

***Short-time work compensation also has its limitations***

While short-time work compensation schemes can help avoid unnecessary job losses during a crisis, there are also some risks attached to their use. For instance, they tend to benefit permanent employees primarily, and may therefore exacerbate the labour market divide between permanent employees and those on temporary and part-time contracts.<sup>65</sup> In addition, and particularly where they are overly generous, such schemes may result in the preservation of inefficient job matches and prevent the reallocation of labour to more productive uses. This may also hinder hiring during the recovery and, for this reason, the OECD has previously suggested that the use of short-time work schemes be discouraged as the economy enters into recovery (OECD, 2010b). These limitations highlight the fact that short-time work compensation should be seen as just one of many ways of reducing working hours during periods of slack. Other methods include working time accounts, reductions in overtime, as well as reductions in working time on the initiative of employers. Under certain circumstances, such alternative schemes may even achieve a more tailored and efficient outcome than a government-led scheme (Cahuc, 2014).

Finally, it is not clear that, even after the reforms, employers in Portugal will make much use of reductions in working time to respond to changing market conditions. In fact, one possible reason for the low take-up of such measures in some countries (e.g. France) is that they have a high share of temporary employees, which makes it easier to make adjustments by shedding labour (Gonthier, 2012). As long as the Portuguese labour market remains highly segmented, labour input adjustments may therefore continue to be made primarily by reducing temporary employment.

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65. Such an argument would apply equally to the use of working time accounts.



**CHAPTER 2****RECENT LABOUR MARKET DEVELOPMENTS AND OUTSTANDING CHALLENGES  
IN PORTUGAL**

The Portuguese labour market reforms were a move in the right direction. Since economic growth turned positive again in early 2013, Portugal has experienced significant improvements in both employment and unemployment rates – greater, in fact, than what one would have expected given the pace of the recovery. However, despite the progress made, many challenges remain. Unemployment remains high (particularly among youth) and this situation has fuelled an increase in both poverty and long-term unemployment (although there are signs of improvement in the latter). The labour market remains highly segmented and, in the context of very low inflation, the presence of downward nominal wage rigidity is likely to remain a barrier to the competitiveness of the Portuguese economy – unless productivity growth is strengthened.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The labour market reforms that Portugal implemented over the period 2011-2015 were described one by one in the previous chapter. While the possible impact of each of these measures was also discussed, this was always done in isolation, assuming a *ceteris paribus* (“all other things held constant”) view of the world. Yet the sheer number of reforms that were undertaken over this period makes it clear that such analysis will only be partial. Indeed, there will be important complementarities between the measures implemented, as well as effects which cancel each other out. There is a need, therefore, to look at the overall evolution of the Portuguese labour market over the reform period.

One should be careful, however, in ascribing general trends in labour market outcomes (whether good or bad) to the reforms that were undertaken. Indeed, establishing any form of causality between the reforms and changes in labour market indicators is complicated by the following facts:

1. The reforms were implemented over a relatively long period of time, which makes it impossible to identify a clear “before” and “after” for the purpose of evaluation.
2. Not much time has elapsed since the labour market reforms, yet some of the measures will take time to produce their full effect and so it may be too soon to evaluate them.<sup>66</sup>
3. Important reforms have been implemented in areas other than employment, which may also have an effect on the labour market.
4. The reforms coincided with a second dip in GDP growth and a gradual recovery. Disentangling the effects of the reforms from those of the economic cycle is notoriously difficult.

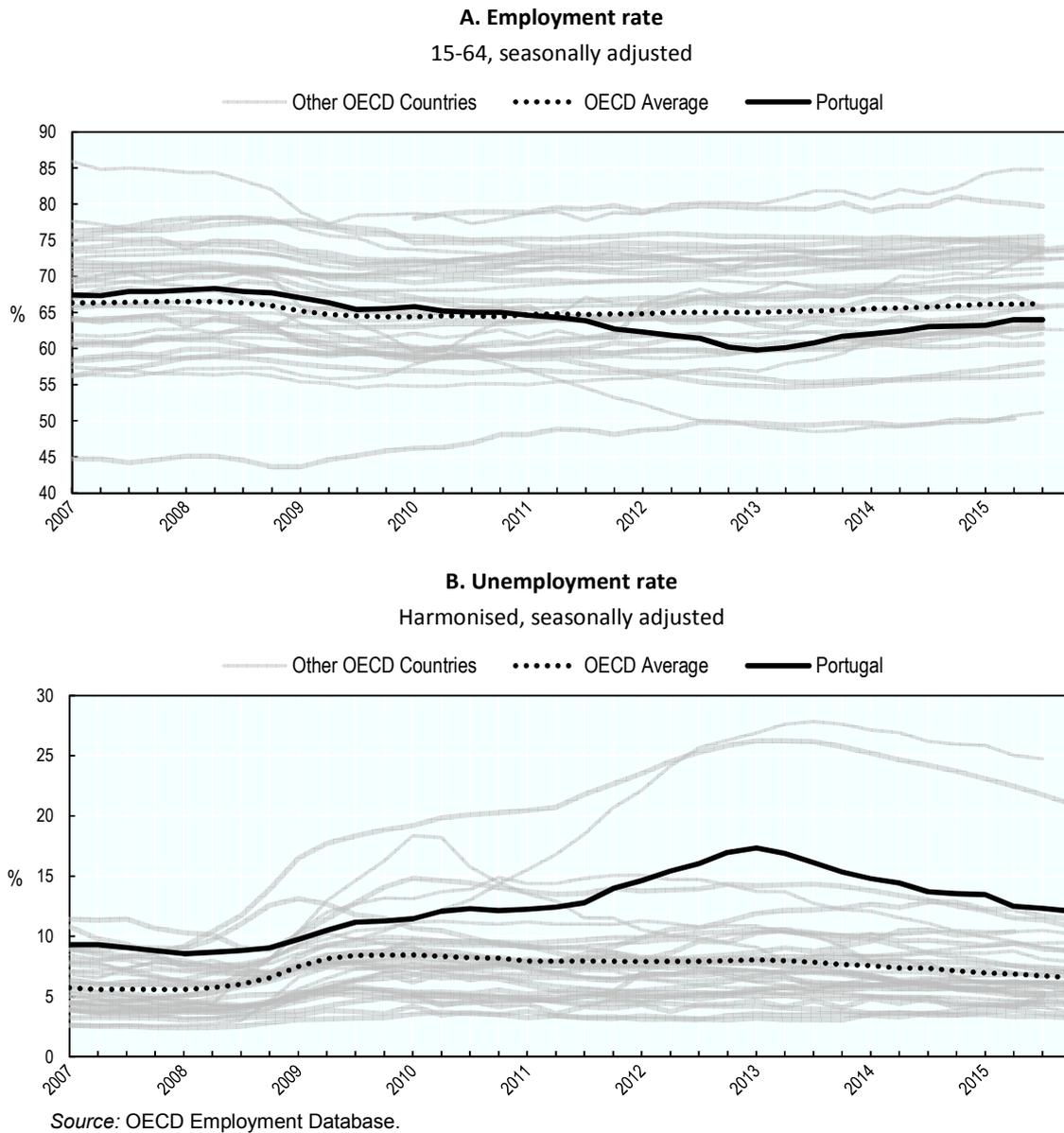
Given these difficulties, the purpose of this chapter is: i) to stand back and provide a descriptive overview of the evolution of some key indicators for the Portuguese labour market over the past few years; and ii) to identify the key challenges that lie ahead.

### **Portugal is moving out of recession and there have been significant improvements in the employment and unemployment rates**

After a prolonged period of negative growth, Portugal is starting to emerge from the crisis. Since the beginning of 2013, there have been significant improvements in both the employment and unemployment rates. The Portuguese employment rate, higher than the OECD average prior to the crisis, fell below the OECD average in 2011, where it remained mid-2015 (Figure 22). It reached its trough at the beginning of 2013 (59.8%), but has seen a significant improvement since. Between the first quarter of 2013 and the final quarter of 2015, the Portuguese employment rate rose by 4.5 percentage points – the third highest rate of increase after Hungary and Iceland, and considerably higher than the 1.6 percentage point rise observed across the OECD on average. The unemployment rate in Portugal saw a very sharp increase during the crisis: from 8.6% at the beginning of 2008 to a peak of 17.3% at the beginning of 2013 (Figure 22), when it was second only to the unemployment rates observed in Spain and Greece. Like the employment rate, however, the Portuguese unemployment rate has seen significant improvements between the first quarter of 2013 and the final quarter of 2015: a fall of 5 percentage points (compared to 1.5 percentage points across the OECD on average). Importantly, the decline in unemployment observed in Portugal is much sharper than what one would have expected given GDP growth and the relationship between GDP growth and unemployment observed in the past (see Box 12). While this should not be interpreted as causal evidence that the reforms are having a positive impact on the labour market, these findings are at least consistent with the impact that would be expected from the reforms.

66. One of the reasons why the measures will take time to produce their full effect is that the impact of some of the reforms, particularly those of employment protection legislation, will depend on the interpretation of these laws by the courts and, therefore, the build-up of case law which will influence individuals’ future behaviour.

Figure 22. Employment and unemployment rates, Q1 2007-Q4 2015



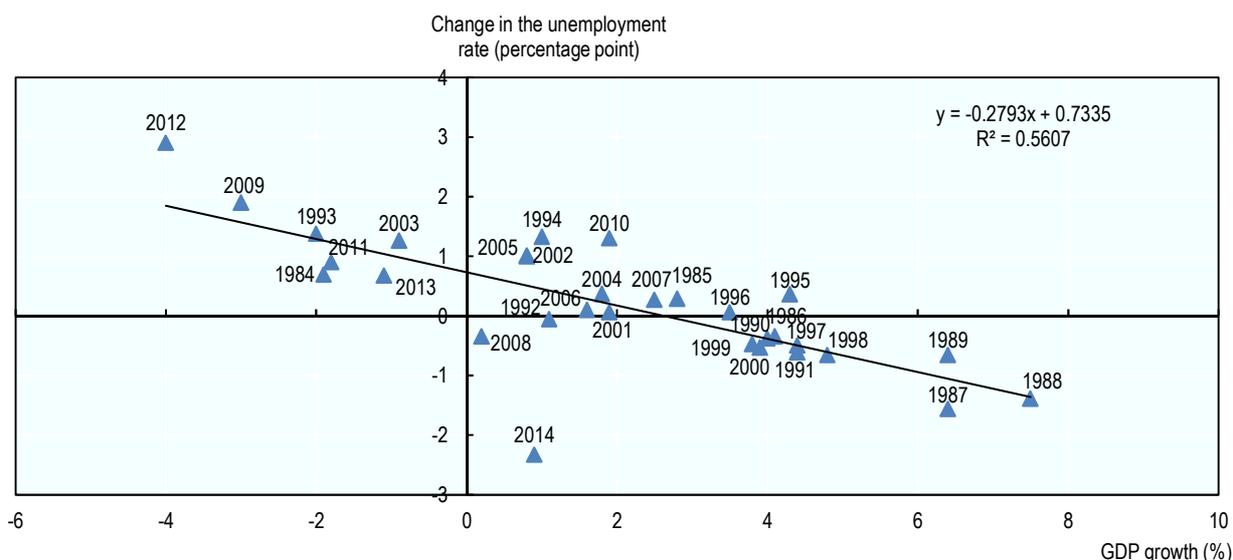
### Box 12. Portugal's strong recovery: How unemployment is falling more sharply than predicted

A well-known stylised fact in economics is the robust relationship between short-term GDP growth and changes in the unemployment rate. This relationship is known as Okun's law, referring to the finding of Okun (1962) that in the United States a 1% increase in real GNP was associated with a 0.3 percentage point drop in the unemployment rate. The existence of a negative relationship has been found for different time periods and countries, although there is substantial variation in the magnitude of the correlation coefficient (Ball, Leigh and Loungani, 2011; Cazes, Verick and Al Hussami, 2013).

Figure A plots this correlation for Portugal for the period 1984-2014 and clearly shows a negative relationship between output and unemployment growth: a 1% increase in real GDP is associated with a 0.28 percentage point drop in the unemployment rate. However, whereas the majority of the observations are very close to the fitted linear regression line, the observation for 2014 is a clear outlier, combining very modest GDP growth (0.9%) with a sharp drop in the unemployment rate (-2.3 percentage points). It seems, therefore, that a departure from the previously observed relationship between output and unemployment growth can be observed during the present recovery, starting in 2013. Indeed, dropping 2013 and 2014 from the sample increases the correlation coefficient (to -0.3) and improves the fit of the regression line (to an  $R^2$  of 0.76).

Figure A. Okun's Law in Portugal, 1984-2014

Relationship between growth in GDP and changes in the unemployment rate

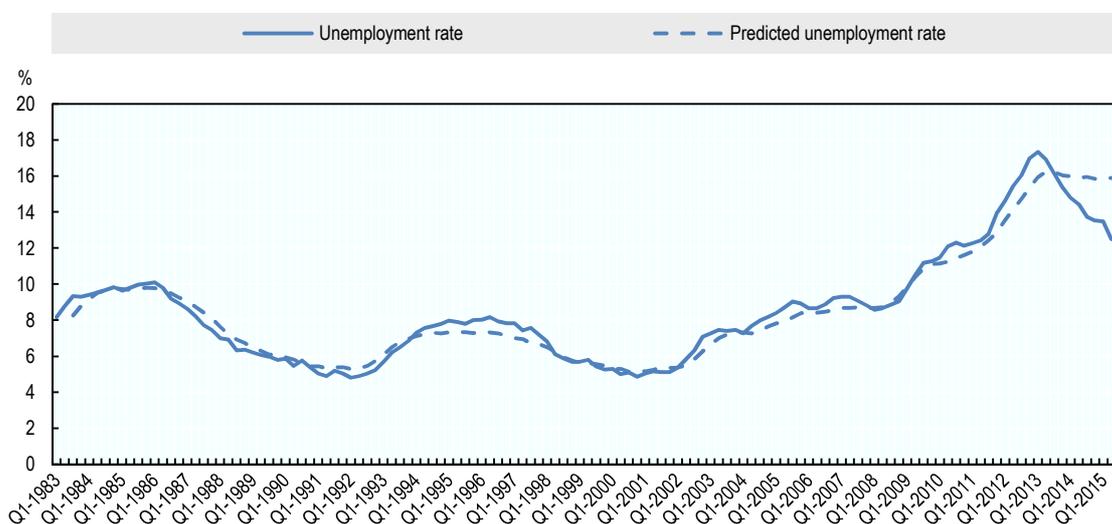


Source: OECD Quarterly National Accounts Database, OECD Short-Term Labour Market Statistics Database.

The departure from the previously observed relationship between output and unemployment growth can be seen even more clearly in Figure B, which compares the actual unemployment rate to the predicted unemployment rate based on the observed relationship between GDP and unemployment rate growth over the period Q1 1984 to Q3 2011 (i.e. prior to the labour market reforms). Whereas the evolution of the predicted unemployment rate follows the trend of the actual unemployment rate closely in most years, including during the most recent recession, there is a big gap between the predicted and actual rates from the second half of 2013 onwards. While according to the predictions, the return to modest growth should have resulted in a levelling off of the unemployment rate, in reality there has been a sharp drop. It would appear, therefore, that the Portuguese labour market has been recovering much faster from the recession than one would have predicted based on pre-reform data, and these findings are in line with those of the European Commission (2015). However, one should also bear in mind that, over the same period, there was a large increase in emigration as well as in the number of unemployed participating in active labour market programmes. Both these factors may have contributed to the pattern observed above.

## Box 12. Portugal's strong recovery: How unemployment is falling more sharply than predicted (cont.)

Figure B. Predicted and actual changes in the unemployment rate, Q1 1983 to Q3 2015



Note: The predicted unemployment rate is estimated by regressing quarterly changes in the unemployment rate on the quarterly GDP growth rate for the period Q1 1984 to Q3 2011, including two lags each for GDP growth and the change in the unemployment rate. The predicted unemployment rate is constructed by adding the predicted change in the unemployment rate to the actual unemployment rate observed in Q1 2001.

Source: OECD analysis based on the OECD Quarterly National Accounts Database and the OECD Short-Term Labour Market Statistics Database.

While not proving that the reforms have had the intended effects, these findings are at least consistent with what one would expect. As argued in Chapter 1, the changes to severance pay rules will only slowly change firing behaviour, since accumulated rights were largely preserved. This may be why unemployment did not rise more than expected when GDP was falling, even after the reforms had been implemented. However, the changes to EPL should imply immediate effects on hiring when growth picks up since new hires start accumulating severance pay under the new rules, which significantly reduced the cost of hiring. Indeed, a preliminary OECD assessment of the severance pay reforms in Portugal suggests that they may have had a relatively large effect on hiring.

Source: Ball, L.M., D. Leigh and P. Loungani (2013), "Okun's Law: Fit at 50?", *IMF Working Papers*, No. 13/10; Cazes, S., S. Verick and F. Al Hussami (2013), "Why did unemployment respond so differently to the global financial crisis across countries? Insights from Okun's Law", *IZA Journal of Labor Policy*, Vol. 2/10; Okun, A.M. (1962), "Potential GNP: Its measurement and significance", *American Statistical Association, Proceedings of the Business and Economics Section*, pp. 98-104.

### A key challenge consists in reducing high rates of youth unemployment

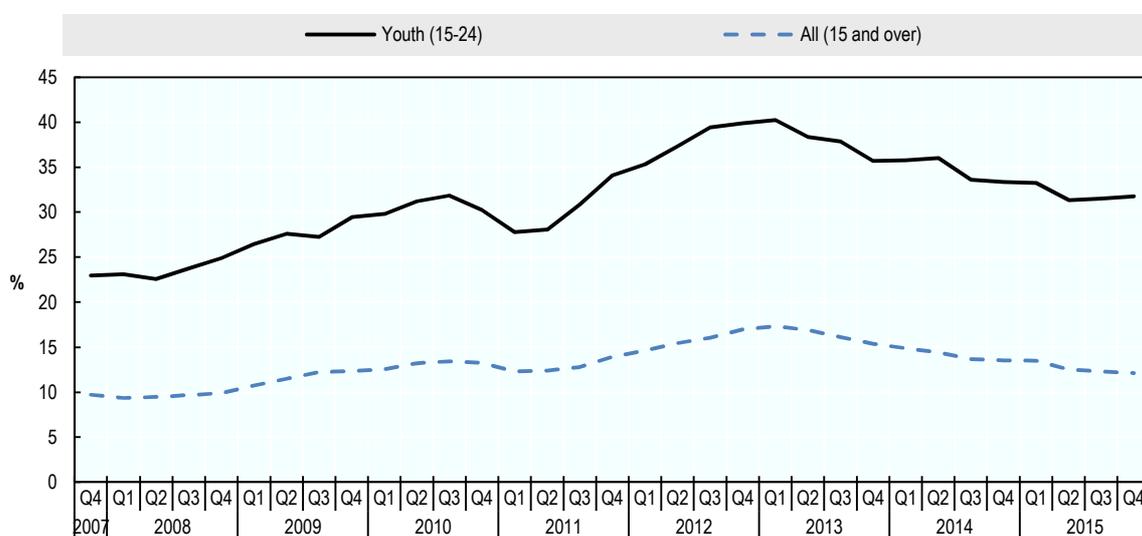
Despite recent improvements, the unemployment rate in Portugal remains high – and certain population groups are more affected than others. A particularly pressing concern going forward is the unemployment rate amongst youth. Young people in Portugal were disproportionately affected by the crisis and, at its peak, youth unemployment stood at 42.5% – 2.3 times the overall unemployment rate (Figure 23). While youth unemployment has also been falling since the beginning of 2013 it remains nearly twice as high as before the crisis. In the third quarter of 2015, Portugal had the 4<sup>th</sup> highest youth unemployment rate in the OECD, after Spain, Greece and Italy.

The disproportionate increase in youth unemployment during the recession also occurred in some other OECD countries, particularly those where (like in Portugal) there is a large gap in employment

protection legislation between temporary and permanent contracts. In those countries, youth are often hired on temporary contracts, with little hope of moving to a permanent position. When a recession hits, it is workers on temporary contracts (and therefore youth) who are most likely to lose their job (Casado, Fernandez and Jimeno, 2015). Further reforms of EPL to reduce labour market duality should therefore be seen as a key ingredient for improving the labour market outcomes of youth in Portugal.

Of course, EPL is not the only front on which youth unemployment should be addressed. Investing in skills, providing adequate income support to the unemployed, putting in place cost-effective active labour market measures, and tackling demand-side barriers are equally important (OECD, 2013a). It is also essential to intervene early to prevent youth at the margins of the labour market from falling into inactivity – after which it becomes much harder to reintegrate them into the labour market. At the European level, there has been a push for member states to adopt a “Youth Guarantee” – a new approach to tackling youth unemployment and inactivity which ensures that all young people under 25 get a good quality, concrete offer (either a job, apprenticeship, traineeship or continued education) within four months of leaving education or becoming unemployed. At the end of 2013, Portugal also adopted a Youth Guarantee, building on the earlier *Impulso Jovem* – a strategic plan to tackle youth unemployment launched in June 2012 and built on four pillars: internships (*Estágios Emprego*), hiring incentives (*Apoios à Contratação*), vocational training (*Formação Profissional*) and entrepreneurship support (*Empreendedorismo*). A more detailed description of these measures is given in Annex A. Going forward, the Portuguese Government should make sure that the Youth Guarantee programme in Portugal is adequately resourced, offers quality and sustainable solutions, and targets the hardest-to-reach (and not just the job-ready). A key challenge here will be to reach out to those youth who are not registered with the Public Employment Service.

Figure 23. Youth unemployment rate, Q4 2007-Q4 2015



Source: OECD Employment Database.

### The incidence of long-term unemployment remains high and continues to rise

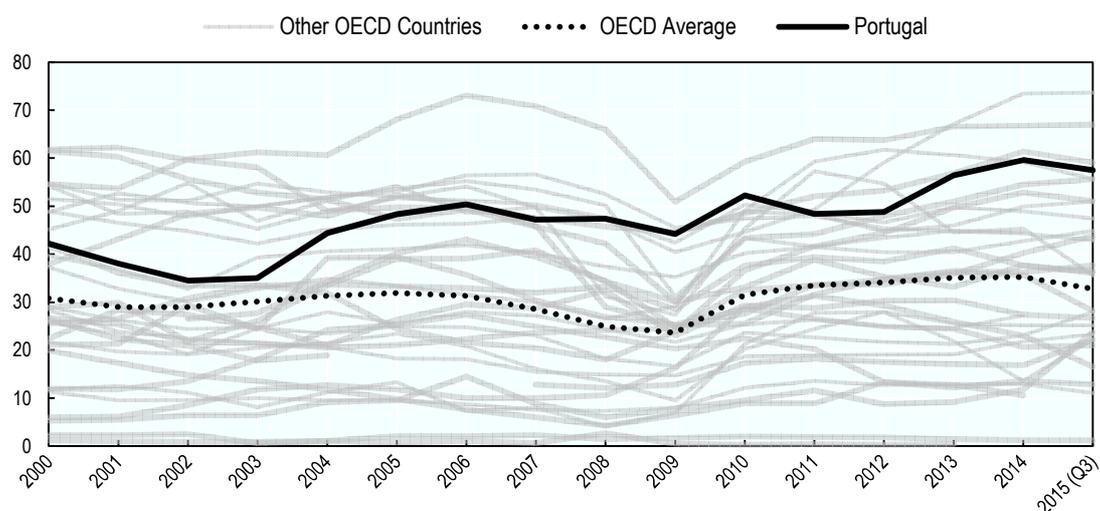
Another challenge the Portuguese labour market faced even prior to the crisis was the high incidence of long-term unemployment, and the reforms of unemployment benefits and activation policy discussed in the previous chapter sought to address this. Some evidence was presented that the strengthening of activation measures has had a positive impact on the monthly reemployment probabilities of the unemployed (Martins and Pessoa e Costa, 2014) – however the reductions in maximum benefit duration

will take time to make their impact felt, as they will only apply from the second unemployment spell after the reform onwards. In addition, the initial evidence suggests that the reductions in benefit levels have not (yet) had an impact on the transition from unemployment to employment.

Moreover, economic conditions remain difficult in Portugal and, while the unemployment rate has fallen in recent years, long-term unemployment remains high and has only been declining slowly since the start of 2015 (Figure 24). In the third quarter of 2015, 57.5% of the unemployed had been out of a job for a year or more, compared to 47% in the third quarter of 2007. Part of the rise in long-term unemployment will reflect a composition effect, as those who have been unemployed least long are most likely to be exiting unemployment as the recovery kicks in, while those who are hardest to help remain behind, which drives up the average duration of unemployment. But long-term unemployment is also self-sustaining: the longer someone has been out of work, the harder it becomes to help that person back into work<sup>67</sup> – which raises the risk of an increase in structural unemployment – and there is some indication that this may already have occurred in Portugal (see Box 13). An additional concern about the rise in long-term unemployment is that it has affected some groups more than others: at the end of 2013, two thirds of the low-skilled unemployed had been out of a job for a year or over – which points to the importance of maintaining (and adapting) the skills of the low-skilled while they are out of work. Chapter 3 delves deeper into the importance of skills investment for improving labour market outcomes in Portugal.

Figure 24. The incidence long-term unemployment, 2000 to Q3 2015

Proportion of the unemployed who have been out of a job for one year or over



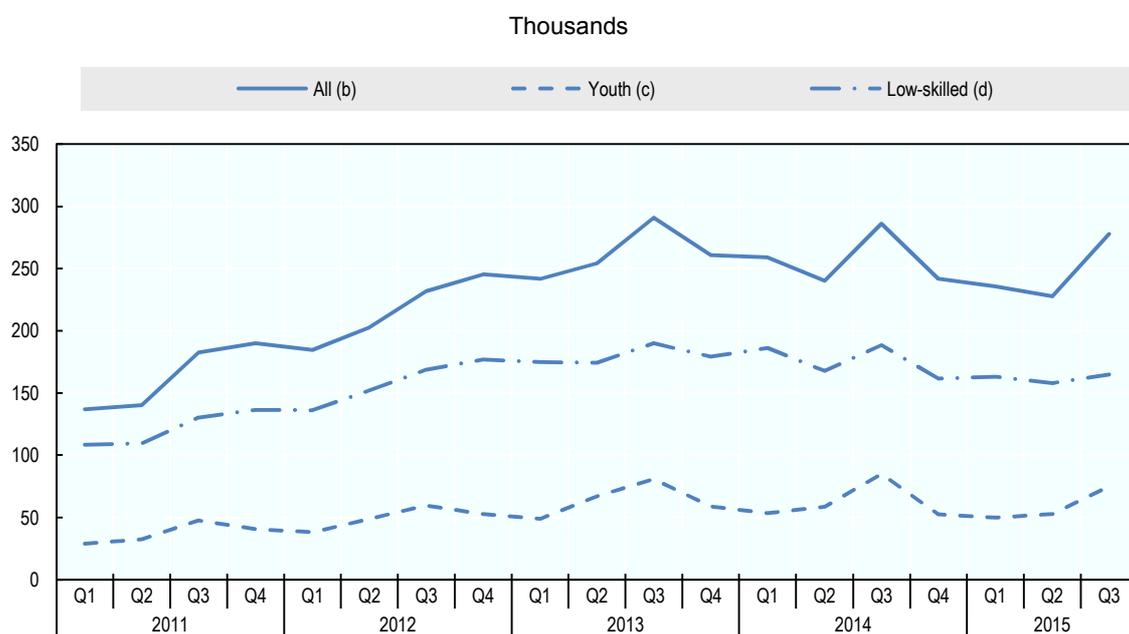
Source: OECD Employment Database.

The recent rise in long-term unemployment is not something that is unique to Portugal, however. Across the OECD, the incidence of long-term unemployment is up by 24% since 2007 (compared to 26% in Portugal). Addressing this high rate of long-term unemployment remains a key challenge for policy makers going forward, since there is a danger that many in this group lose their skills and motivation or, worse even, become permanently disengaged from the labour market. Indeed, the increased risk of marginalisation among the unemployed may not only show up in the form of increased long-term

67. There may be several reasons for this. On the one hand, employers become less and less likely to hire an individual the longer he/she has been unemployed, which could either be a result of employer screening or of human capital depreciation. On the other hand, individuals themselves might become increasingly discouraged and lower their search effort.

unemployment, but also in the rate at which the unemployed are dropping out of the labour force altogether. Figure 25 shows the trend in marginally attached persons (i.e. persons out of the labour force who are willing to work and available for work, but are not actively seeking work). The total number of marginally attached persons in Portugal more than doubled between the first quarter of 2011<sup>68</sup> and the third quarter of 2013, when they totalled 290 000 individuals – most of whom (two in three) were low-skilled. Again, this points to the importance of strengthening skills policies in Portugal. The number of marginally attached persons has been on the decline since the end of 2013, with the exception of a temporary rise in the third quarter of 2014 and an increase in the final quarter of the sample (2015Q3). The most recent fluctuations are mainly driven by youth, with the number of low-skilled marginally attached workers remaining fairly constant.

Figure 25. Number of persons marginally attached to the labour force<sup>a</sup>, Q1 2011 to Q3 2015



- a. Persons not in the labour force who did not actively look for work during the past four weeks, but wish to work and are available for work.
- b. All individuals aged 15-64.
- c. Ages 15-24.
- d. ISCED levels 0-2.

Source: OECD analysis based on the Inquérito ao Emprego.

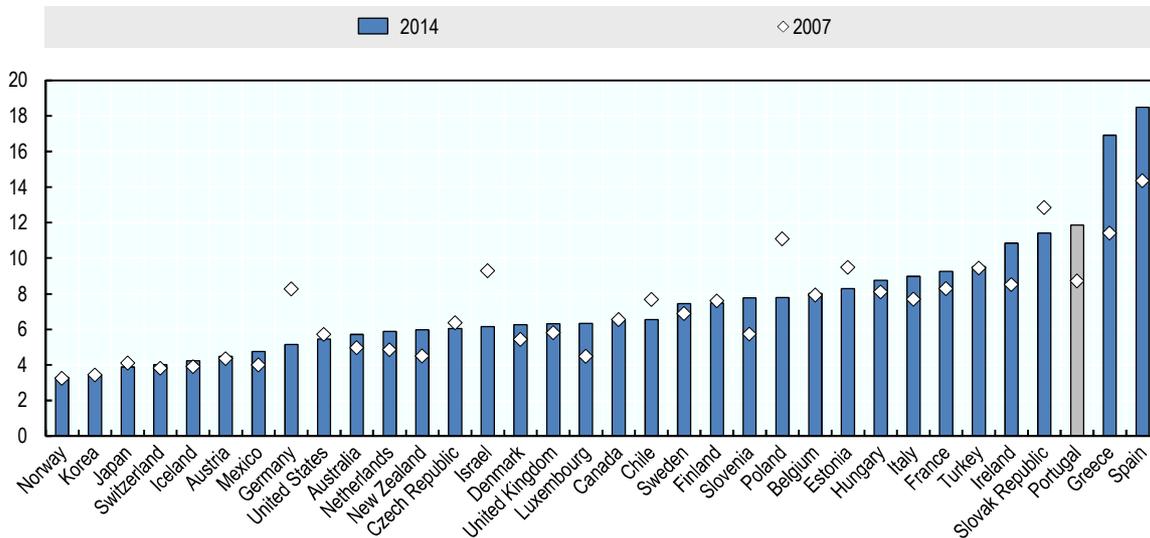
68. Data are presented from 2011 onwards, because the series before and after the break in the LFS data in 2011 are not comparable.

### Box 13. Is structural unemployment rising in Portugal?

#### The non-accelerating inflation rate of unemployment (NAIRU) has risen

The concern with high levels of long-term unemployment is that some of it may turn structural as certain individuals become further and further removed from the labour market and find it increasingly difficult to return to work. Two measures tend to be used to assess whether a rise in structural unemployment is taking place. The first of these is the non-accelerating inflation rate of unemployment (NAIRU), which is a measure of the level of the unemployment rate that is consistent with a constant rate of inflation. Figure A shows not only that the NAIRU is significantly higher in Portugal than it is in most other OECD countries, but also that it has risen substantially over the period 2007-2014. The NAIRU has risen by 5.5 percentage points in Greece, 4.1 percentage points in Spain, and 3.1 percentage points in Portugal.

Figure A. The non-accelerating inflation rate of unemployment (NAIRU), 2007-2014



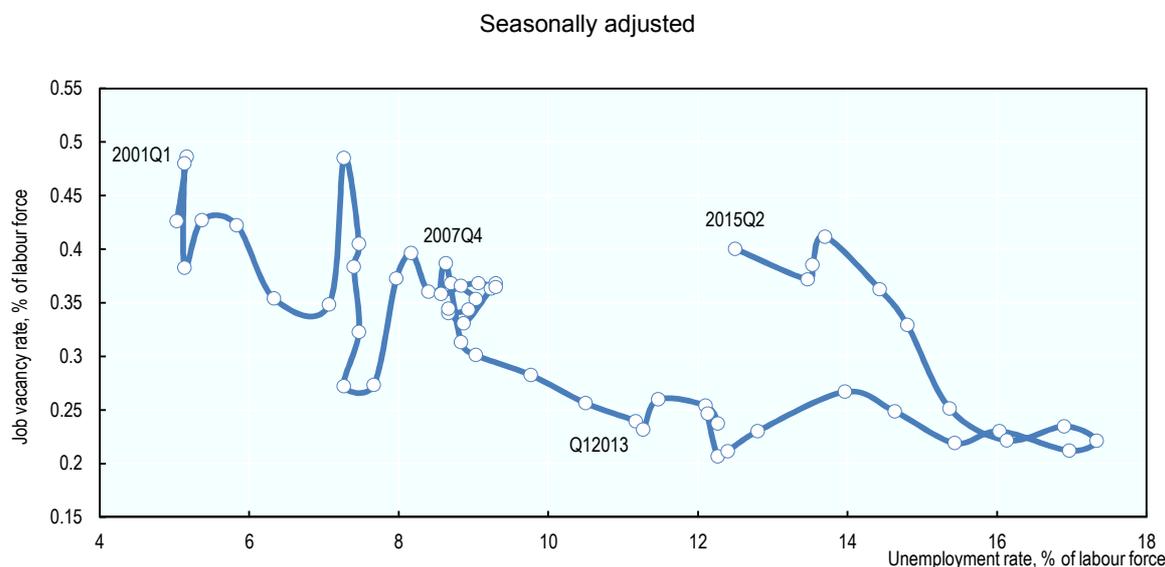
Source: OECD Economic Outlook Database.

#### There may be signs of a reduction in matching efficiency

An alternative way of assessing whether there has been an increase in the structural level of unemployment is to look at whether there has been a reduction in matching efficiency – i.e. whether a given level of vacancies is now associated with a higher level of unemployment, which would signal that it has become more difficult for unemployed jobseekers to find suitable job vacancies (and for firms to fill existing vacancies with qualified jobseekers). The relationship between job vacancies and the level of unemployment is also known as the Beveridge curve, which is downward sloping: as the number of vacancies increases, the unemployment rate falls (and vice versa). Figure B shows that there has been a definite outward shift in the Portuguese Beveridge curve as the crisis progressed (particularly from the beginning of 2013 onwards) – meaning that for a given level of vacancies, the unemployment rate is now higher. One difficulty with deciding whether this shift is permanent or not is that vacancies tend to respond more quickly to business-cycle conditions than the unemployment rate, so that instead of shifting out permanently, the Beveridge curve may simply trace out a counter-clockwise loop. Indeed, there is some indication from Figure B that the situation in Portugal has been improving since around mid-2014, with a fall in the unemployment rate for a vacancy rate which has remained more or less constant.

Box 13. Is structural unemployment rising in Portugal? (cont.)

Figure B. Portugal's Beveridge curve, Q1 2001 to Q2 2015



Source: OECD Short-Term Labour Market Statistics and Eurostat Job Vacancy Survey. See OECD (2014), *OECD Employment Outlook 2014* for more details on the vacancy data.

**The labour market is still highly segmented, and is likely to remain so unless further reforms are undertaken**

*Despite the reforms of severance pay, employers still have strong incentives to hire on temporary contracts*

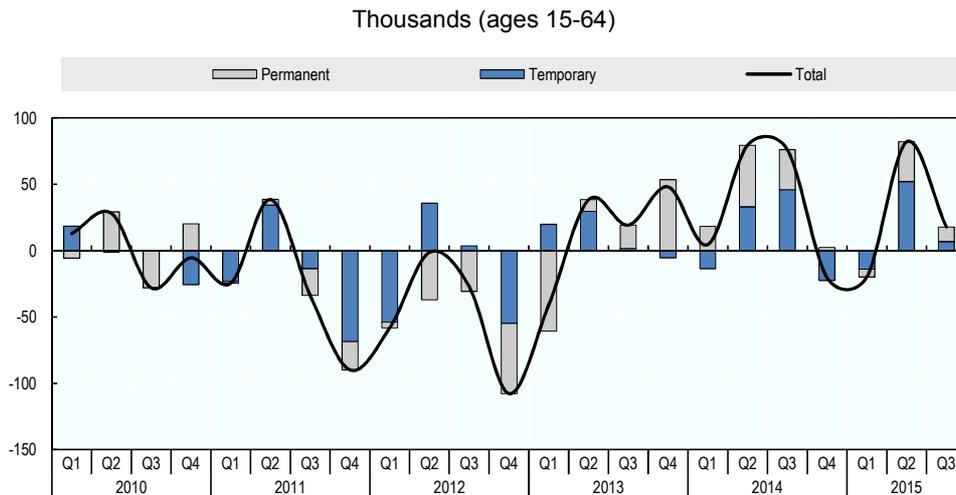
Prior to the crisis, the Portuguese labour market was characterised by a high degree of segmentation: in 2007, 22.3% of workers in dependent employment had a temporary contract, compared to just 12.2% across the OECD on average. The incidence of temporary employment in Portugal was even higher for certain groups, like young people (53.1%). While temporary employment in itself is not necessarily bad (indeed, some workers may prefer the flexibility that it offers), excessive use of such types of contracts can have an adverse impact on both equity and efficiency.<sup>69</sup> In particular, workers on these contracts often face a higher degree of job insecurity than employees on regular contracts, and firms may invest less in non-regular workers, which in turn may depress productivity growth (OECD, 2014b).

The high incidence of temporary employment in Portugal is to a large extent attributable to the important gap in employment protection legislation (EPL) between permanent and temporary contracts (see Chapter 1). Some of the labour market reforms in recent years have sought to reduce this gap. For example, severance pay on new permanent contracts is now lower than on temporary contracts, and there is

69. From the employer's point of view, temporary contracts offer more flexibility. There may also be some economic activity which would be difficult to carry out without such flexibility, e.g. in agriculture, tourism, retail and restaurants – which could be particularly important in the case of Portugal (Alves, 2015). Finally, there is evidence that employers use temporary contracts as a selection mechanism (screening device) into permanent contracts (Portugal and Varejão, 2010).

some evidence that this may have incentivised hiring on permanent contracts (see Box 2 in Chapter 1). Despite this, a large proportion (35%) of the employment growth between Q1 2013 and Q3 2015 has been on temporary contracts (Figure 26) and the share of temporary employment in total employment has barely budged (Figure 27). While the incidence of temporary employment in Portugal is down very slightly (to 21.5% in 2014), a similar reduction occurred on average across the OECD (to 11.1% in 2014) and will largely reflect the fact that workers on temporary contracts were more likely to lose their job during the crisis.

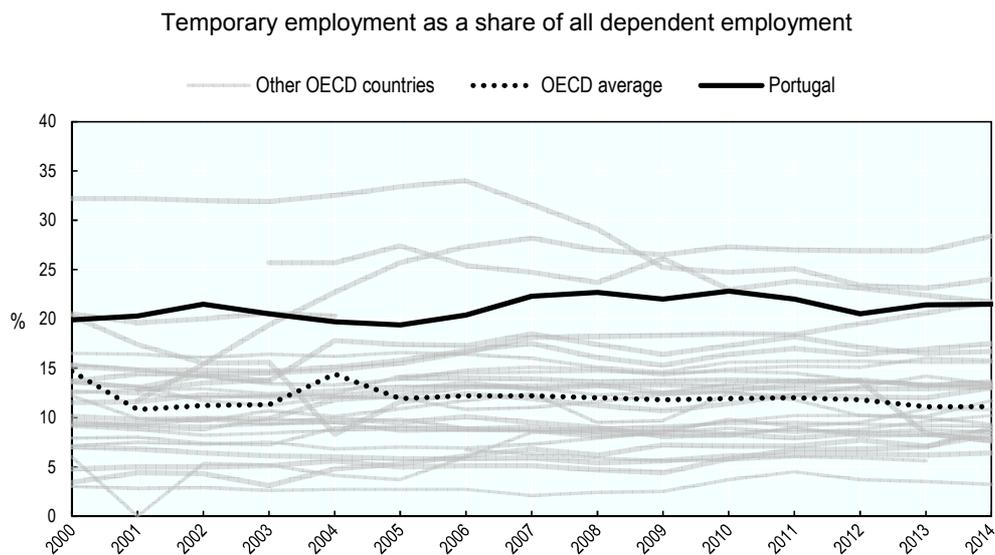
Figure 26. Change in employment by type of contract, Q1 2010-Q3 2015



Note: Because of a methodological change in the Portuguese Labour Force Survey, data prior to 2011 are not fully comparable with the more recent data. The new methodology results in higher levels of unemployment and inactivity compared to the methodology used prior to 2011. For detailed information, see Statistics Portugal (2011).

Source: Eurostat.

Figure 27. Incidence of temporary employment, 2000-2014



Source: OECD Employment Database.

There are several reasons why one should expect the incidence of temporary contracts in Portugal to remain high, particularly in the short-run. The first of these is that, while the reforms significantly reduced severance pay on new contracts, existing severance pay entitlements were largely preserved so that there is unlikely to be any immediate effect of the reform on firing behaviour (and evidence in support of this was presented in Chapter 1). Secondly (and most importantly), the procedural requirements for firing a worker on permanent contracts remain significantly more demanding than those for workers on temporary contracts, and so the reduction in severance pay may actually not have made much difference to employers. The third reason why there may have been little movement in the share of temporary employment over the period analysed in this report is that, on two separate occasions, employers were allowed to temporarily extend the duration of fixed-term contracts as a crisis-related measure. Finally, as long as employers in Portugal face downward wage rigidity, temporary contracts will remain a key source of flexibility, and so employers will continue hiring on temporary contracts as long as this gap in employment protection legislation between the two types of contracts persists. This last reason may be particularly relevant in the present economic climate: with a weak and hesitant recovery employers will remain uncertain about the future and therefore unwilling to offer workers the promise of a permanent contract.

***The share of self-employed in total employment has fallen***

Another facet of labour market segmentation in Portugal is the high prevalence of dependent self-employment. While specific data are not available to assess the extent of this problem (or how it has evolved over the crisis), data from Eurostat (based on the Portuguese Labour Force Survey) show that, at the beginning of 2008, nearly one in five persons in employment was self-employed (19.3%) – 13.6% without employees and 5.6% with (Figure 28). A significant, but declining, share of the self-employed without employees are working in the agricultural sector. Since the end of 2013, there has been a fall in the share of self-employed which is driven largely by a decrease in the share of self-employed without employees (from 12.1% in Q3 2013 to 9.8% in Q3 of 2015).<sup>70</sup> This fall coincides with the introduction of new powers of the labour inspectorate (ACT) to clamp down on false self-employment. However, it occurs primarily in the agricultural sector. It also comes at the same time as the economy starts moving out of recession and could partly reflect individuals who had taken up self-employment during the crisis as a survival mechanism and are now moving back into regular jobs.<sup>71</sup>

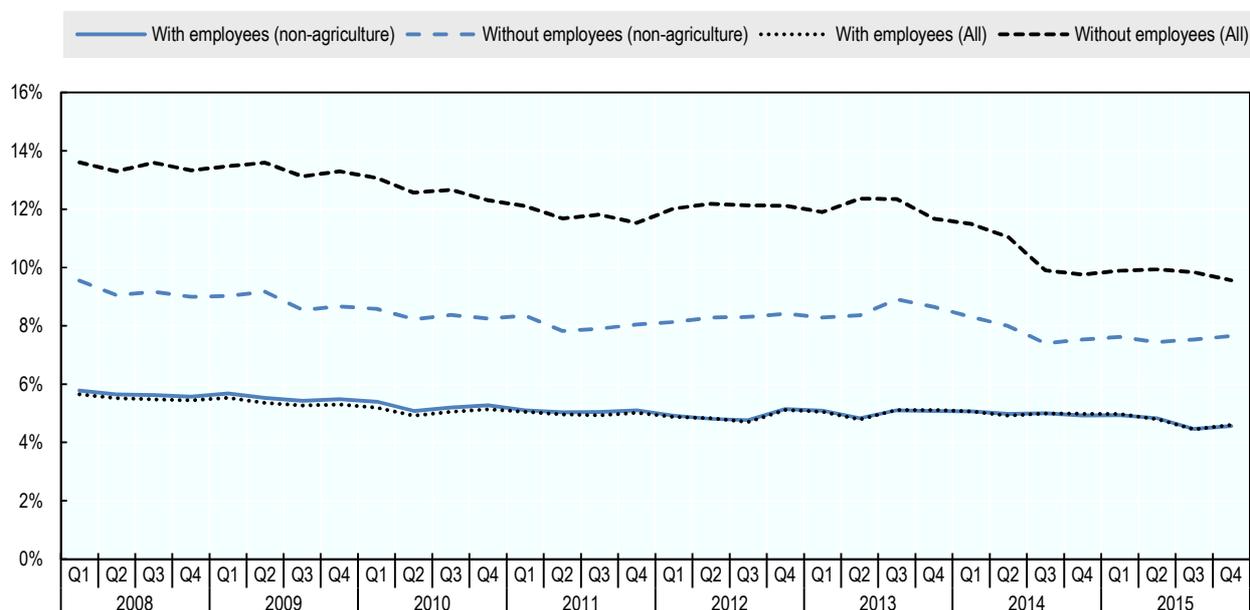
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70. Note that the fall in self-employment occurs both for individuals active in the private and in the public sector (although it is slightly more marked in the former).

71. Martins (2016b) argues that the reduction in severance pay on new employees encouraged firms to hire employees instead of contractors.

Figure 28. Trends in self-employment, with and without employees, 2008-2015

Self-employed persons aged 15 years and older as a share of total employment



Note: Because of a methodological change in the Portuguese Labour Force Survey, data prior to 2011 are not fully comparable with the more recent data. The new methodology results in higher levels of unemployment and inactivity compared to the methodology used prior to 2011. For detailed information, see Statistics Portugal (2011).

Source: Eurostat.

**There were some improvements in competitiveness during the crisis, but this trend might have started reversing again**

### *Unit labour costs fell significantly in 2011 and 2012*

One major obstacle to achieving higher and more sustainable growth rates in Portugal is its low external competitiveness (OECD, 2014c; IMF, 2015). In most quarters between 2002 and the start of the crisis, unit labour costs (ULCs)<sup>72</sup> in Portugal increased faster than the OECD average (Panel A of 29), while productivity rose less fast than the OECD average and, in some quarters, even fell (Panel C of Figure 29). Throughout this period, rises in labour compensation tended to exceed gains in productivity, leading to a gradual deterioration of Portugal's external competitiveness. Part of the labour market reforms and interventions over the period 2011-2015 (e.g. changes to collective bargaining arrangements, the freeze in extensions as well as in the minimum wage, cuts in overtime compensation, etc.) were targeted at reversing this trend – with some success. As shown in Panel A of Figure 29, there was a fall in ULCs in Portugal in 2010, but especially in 2011 and 2012, with some further falls in 2014. As shown by Panel B of Figure 29, this was related primarily to falls in labour compensation per person employed.

72. Unit labour costs (ULC) are a commonly-used measure of competitiveness, and are obtained as the ratio between total labour compensation per unit of labour input and labour productivity. Two important caveats need to be mentioned about the use of ULCs as a measure of competitiveness. First, they are not a comprehensive measure of competitiveness, but just a reflection of cost competitiveness. Second, ULCs deal exclusively with the cost of labour which, though important, should also be considered in relation to changes in the cost of capital. However, because of problems of international consistency of data, it is usual to take indices of unit labour costs rather than total costs.

### *The fall in unit labour costs was larger in the public than in the private sector*

The falls in ULCs and compensation per person employed in Portugal were more marked in the public than in the private sector (Figure 30). Compensation in the public sector rose steadily over the period 2007-2009 (at a higher pace than in the private sector). However, this trend started reversing in 2011 (coinciding with the cuts in wages of civil servants earning more than EUR 1 500), and turned into a very significant drop in ULCs and labour compensation at the start of 2012 (when cuts in 13<sup>th</sup> and 14<sup>th</sup> monthly payments were implemented). In 2013, this fall was entirely reversed with the ruling of the Constitutional Court that the cuts in bonuses were unconstitutional. A similar pattern can be observed in 2014, when the Budget Law introduced new cuts to the wages of public sector workers, which were again declared unconstitutional later that year. These findings are consistent with the observations of INE (2013, 2014) that the overall decline in ULCs in 2011 and 2012 was largely driven by falling general government wages (through the non-payment of holiday and Christmas bonuses to civil servants), while the rise in 2013 was associated with the reinstatement of the bonuses in general government.

### *A high level of wage rigidity continues to threaten Portuguese competitiveness*

When looking at the non-agricultural business sector (excluding real estate), there has been a gradual but continuous decline in ULCs over the period 2009-2012 (Panel B of Figure 30). While there were some falls in labour compensation per hour worked in 2011 as well as in 2013, most of the fall in ULCs was driven by productivity gains<sup>73</sup> in the wake of job cuts.<sup>74</sup> Box 14 offers a more detailed look at the evolution of wages in the private non-agricultural business sector (excluding real estate) over the period 2010-2014. It shows how government policies helped achieve wage moderation during the crisis, with around one in two workers experiencing real falls in their base wage in each year over the period 2010-2014. That being said, these real falls were relatively modest and affected job movers in particular. At the same time, the evidence suggests a considerable amount of nominal wage rigidity in the Portuguese economy, with around three quarters of workers having had their base wages frozen in both 2012 and 2013.<sup>75</sup> Such wage rigidity (driven by the legal prohibition to cut nominal base wages) is likely to continue to harm Portuguese competitiveness in years to come if inflation remains low – unless there is a significant strengthening in productivity growth.<sup>76,77</sup> The evidence presented in Box 14 further suggests that, with the exception of a real fall in 2011, “other” wage components kept on rising both in nominal as well as in real terms, and that the reductions in overtime pay, while significant (particularly in 2012), represent only a minute share of the average wage bill per employee.

73. Leal and Martins (2015) argue that there is a relatively strong relationship over the period 2002 to 2014 between nominal wage increases stipulated in collective wage agreements and the percentage change in average compensation per worker – suggesting that moderate wage increases in collective agreements during the crisis contributed to the fall in unit labour costs by reining in increases in average compensation per worker.

74. An alternative possibility is that firms adjust in their effort margins during recessions, requiring workers to produce more than in better times (Card and Mas, 2016).

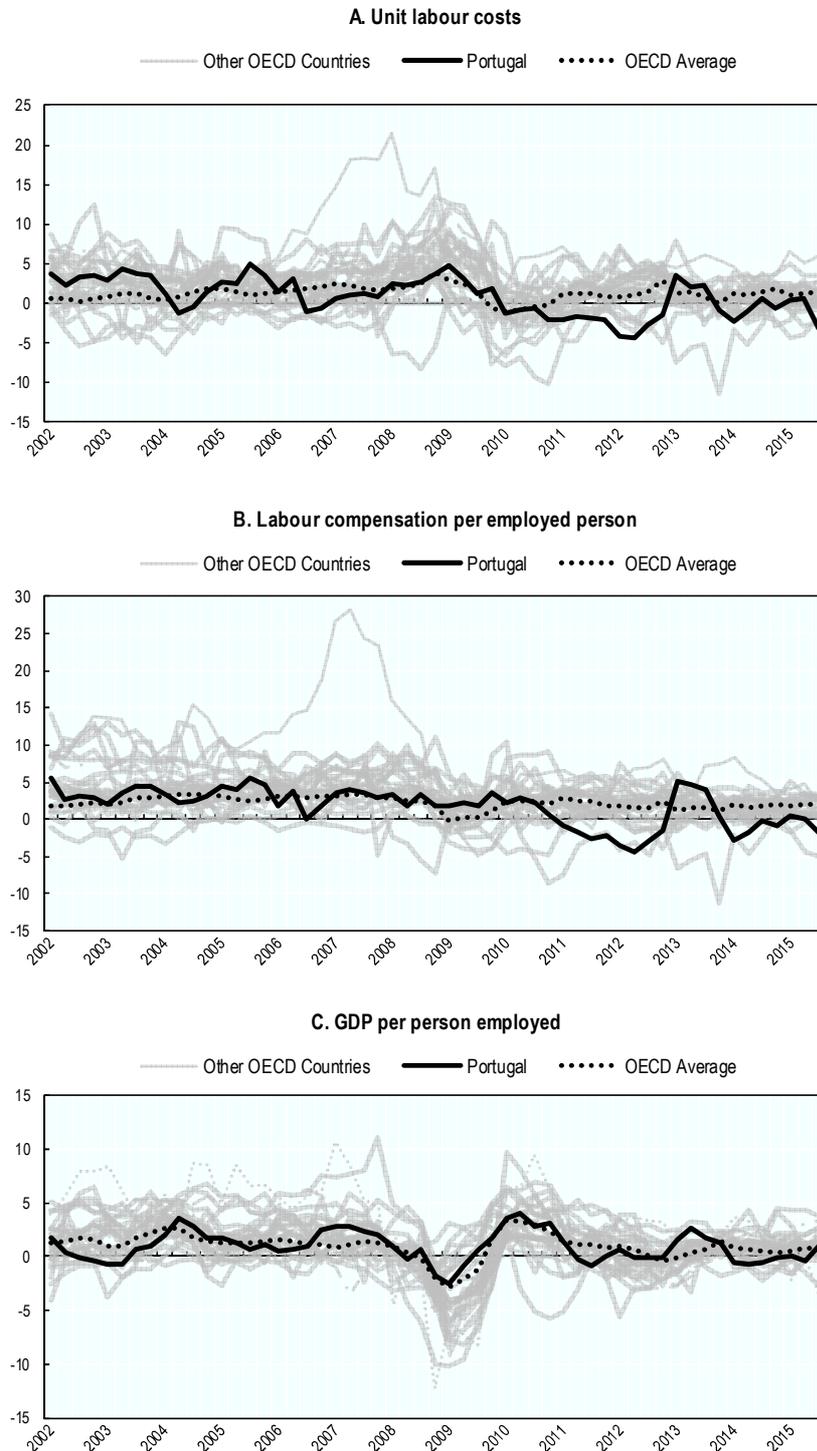
75. These findings are consistent with many published studies for Portugal, including Duarte (2008), Portugal, Carneiro and Guimarães (2010), Carneiro, Portugal and Varejão (2014).

76. Wage rigidity in Portugal has been found to be a greater problem for small firms (Duarte, 2008) and may be part of the reason why those firms also exhibit higher rates of turnover (Centeno, Machado and Novo, 2007). That being said, wage rigidity tends to be higher in the services and construction sectors than in the manufacturing sector.

77. Another possible consequence of high nominal wage rigidity is that wage growth in the Portuguese economy is likely to remain very low in the short-run because of “pent-up wage inflation” (Martins and Portugal, 2014).

Figure 29. Evolution of quarterly unit labour costs and its components, Q1 2002-Q2 2015

Quarterly change on the same quarter of the previous year, seasonally adjusted

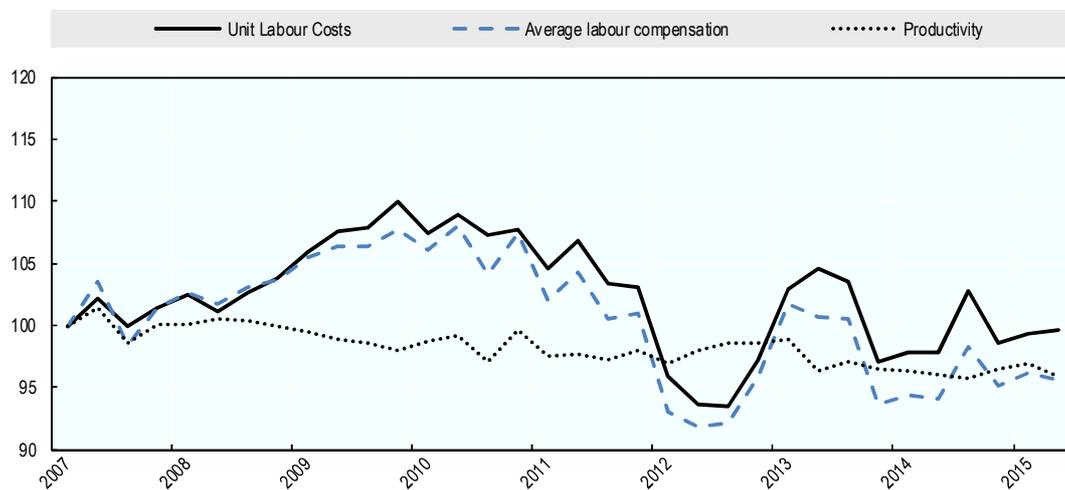


Source: OECD Productivity Database.

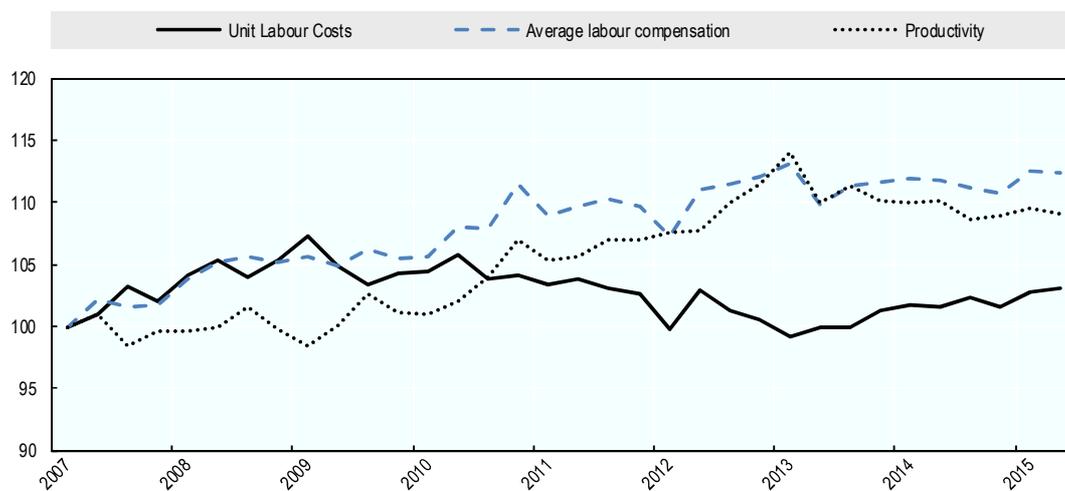
Figure 30. Evolution of quarterly unit labour costs and its components, public versus private sectors, Q1 2007-Q2 2015

Index, Q1 2007=100

A. Public sector



B. Private non-agricultural business sector (excluding real estate)



Note: Total labour costs based on hours worked. Data has been deseasonalised.

Source: OECD Quarterly National Accounts Database.

**Box 14. Wages in the private sector during the crisis: Wage moderation and nominal wage rigidity**

The significant employment losses observed in Portugal during the crisis can, according to some commentators, be blamed largely on a high level of (nominal) wage rigidity which, combined with an important share of temporary workers, makes it easier for employers to adjust to business cycle fluctuations by reducing headcounts than by revising wages downwards. Indeed, when Portuguese employers are asked how they cut costs in response to negative shocks, 72% say they reduce their workforce – by far the most common strategy cited (Dia, Marques and Martins, 2012).

A number of measures were taken by the government to try and achieve wage moderation during the crisis: the minimum wage was frozen, the number of extensions of collective agreements was kept in check, and significant reductions in overtime pay were brought in.

Against this background, this box uses the *Quadros de Pessoal* data<sup>1</sup> to analyse the behaviour of (nominal and real) wages in the private non-agricultural business sector (excluding real estate) during the crisis and, where possible, breaks this down by wage component. The findings confirm a high degree of downward rigidity in nominal base wages in Portugal: a large number of employees had their base wages frozen during the crisis. Over the period 2010-2013, nominal wage growth was modest in the business sector, and wages fell in real terms. There is evidence also of a significant drop in overtime pay – although this only represents a very small proportion of firms' total wage bill.

**Nominal wage growth was modest, and there were some falls in real wages**

Average hourly wages (in nominal terms) continued to rise modestly in 2011 (+1.0%) and 2012 (+1.7%), but fell slightly in 2013 (-0.5%) and 2014 (-0.3%) – Table A. The fall in 2013 and 2014 was largely due to the substitution of higher-paid with lower-paid workers.<sup>2</sup> Indeed, when looking only at workers who remained employed between two consecutive years, nominal (hourly) wages rose in each year (by 1.9%, 1.4%, 1.6% and 2.5%, respectively). In real terms, average hourly wages fell in each year over this period (although there was real wage growth in 2013 and 2014 for workers who remained employed).

**Table A. Average nominal and real wage growth of private sector employees in Portugal, 2010-2014**

## Change in hourly wages

	Year	All workers				People remaining in employment			
		Total	Base	Overtime	Other	Total	Base	Overtime	Other
Nominal	2011	1.0%	0.7%	2.1%	1.4%	1.9%	1.5%	3.2%	3.2%
	2012	1.7%	1.3%	-22.0%	4.2%	1.4%	1.1%	-22.1%	4.5%
	2013	-0.5%	-0.6%	-2.5%	1.2%	1.6%	1.2%	-0.9%	4.1%
	2014	-0.3%	-0.6%	0.4%	0.3%	2.5%	1.9%	3.2%	4.3%
Real	2011	-2.7%	-3.0%	-1.6%	-2.3%	-1.8%	-2.2%	-0.5%	-0.5%
	2012	-1.0%	-1.4%	-24.7%	1.5%	-1.3%	-1.6%	-24.8%	1.8%
	2013	-0.8%	-0.9%	-2.8%	1.0%	1.4%	1.0%	-1.2%	3.8%
	2014	-0.1%	-0.3%	0.7%	0.6%	2.7%	2.2%	3.5%	4.5%

*Note:* Changes in overtime and other pay are estimated only for employees who receive such payments. Hourly overtime payments are obtained by dividing total overtime pay by the number of overtime hours worked. Hourly "other" payments are obtained by dividing total other pay by the number of regular hours worked. People remaining in employment are defined as workers who are employed in two consecutive years.

*Source:* OECD analysis based on the *Quadros de Pessoal* 2010-2014; price indices from the OECD Prices and Purchasing Power Parities dataset.

Box 14. **Wages in the private sector during the crisis: Wage moderation and nominal wage rigidity** (cont.)

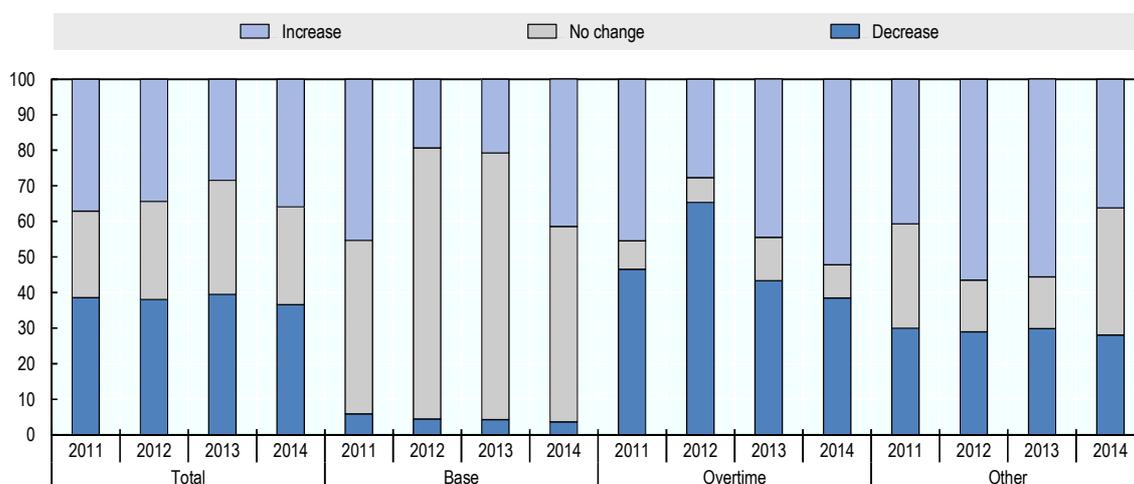
**The base wages of a large proportion of workers were frozen**

Table A also breaks down the evolution of wages by wage component: base wages, compensation for overtime, and other wage components. Changes in base wages were closely aligned to changes in total wages, although they grew even less. Despite the severity of the crisis, the average nominal base wage of workers who kept their job in consecutive years did not fall. Such cuts are in fact forbidden by Portuguese law. Given this constraint, employers still have the option in times of crisis to freeze base wages in the hope that inflation will bring real wages down. This was indeed a very common strategy used by employers in Portugal during the crisis. Looking at employees in the non-agricultural private business sector who remained employed in two consecutive years, Figure A shows that 49% had their base wages frozen in 2011, rising to 76% in 2012 and 75% in 2013. In 2014 the share of workers with constant base wages fell to 55%. These figures are substantially larger than what was observed in countries like the United States (where around 4% of job stayers had their nominal wages frozen) and the United Kingdom (where only around 9% of job stayers had zero nominal wage change) – see Elsby, Shin and Solon (2016). This indicates a substantial element of nominal wage rigidity in the Portuguese labour market.<sup>3</sup> The freezing of nominal base wages by Portuguese employers will have been made easier by government policy during the period, including the freezing of the minimum wage, as well as the reduction in extensions of collective agreements.

As in the case of total wages, however, Table A shows that base wages fell in real terms throughout the period (although workers who remained employed saw a real wage increase in 2013 and 2014). Figure B shows that around one out of two workers saw their base wage fall in real terms in each year.

Figure A. **Proportion of workers who experienced nominal hourly wage increases, freezes and falls, 2010-2014**

As a proportion of workers who remained employed in two consecutive years



Note: Changes in overtime and other pay are estimated only for employees who receive such payments in at least one of period  $t$  or  $t+1$ . Hourly overtime payments are obtained by dividing total overtime pay by the number of overtime hours worked. Hourly "other" payments are obtained by dividing total other pay by the number of regular hours worked. Wages are assumed to exhibit "no change" if wages at time  $t$  and  $t+1$  do not differ more than 1%.

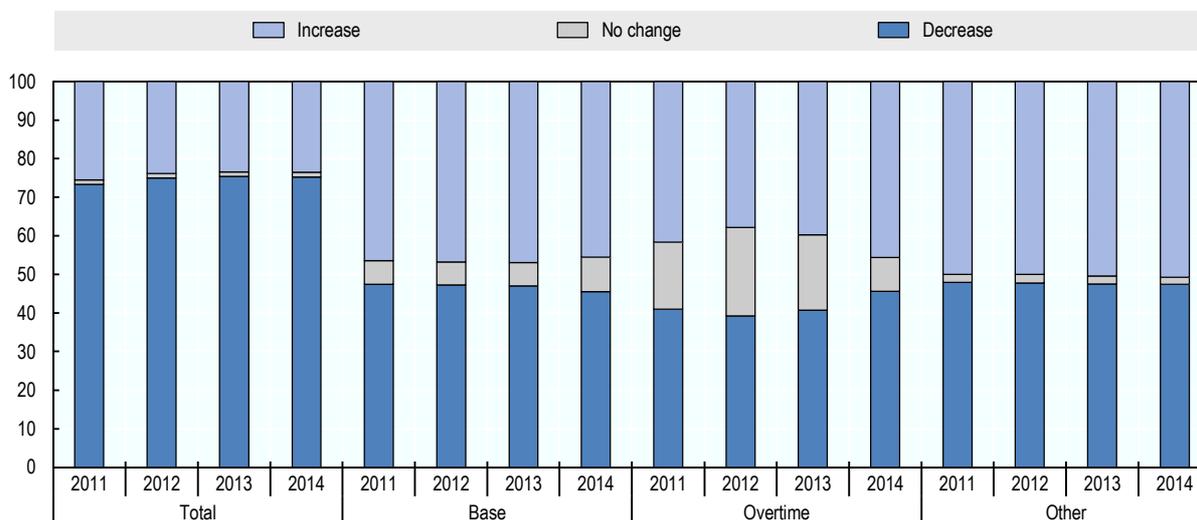
Source: OECD analysis based on the *Quadros de Pessoal*.

While Figure A indicates that between 4 and 6% of workers who remained employed had a reduction in their hourly nominal base wage each year, in around 99% of these cases this was accompanied by a change of employer. Note that these percentages are very small compared to the proportion of workers who suffered nominal wage cuts in the United States and the United Kingdom. In the United Kingdom, nearly one in four job stayers experienced a nominal wage cut over the periods 2009-2010 and 2011-2012, while in the United States nearly one in four job stayers experienced a nominal wage cut of at least 0.5% (Elsby, Shin and Solon, 2016).

## Box 14. Wages in the private sector during the crisis: Wage moderation and nominal wage rigidity (cont.)

Figure B. Proportion of workers who experienced real hourly wage increases, freezes and falls, 2010-2014

As a proportion of workers who remained employed in two consecutive years



Note: Changes in overtime and other pay are estimated only for employees who receive such payments in at least one of period t or t+1. Hourly overtime payments are obtained by dividing total overtime pay by the number of overtime hours worked. Hourly “other” payments are obtained by dividing total other pay by the number of regular hours worked. Wages are assumed to exhibit “no change” if wages at time t and t+1 do not differ more than 1%.

Source: OECD analysis based on the *Quadros de Pessoal*.

### There were significant reductions in overtime pay

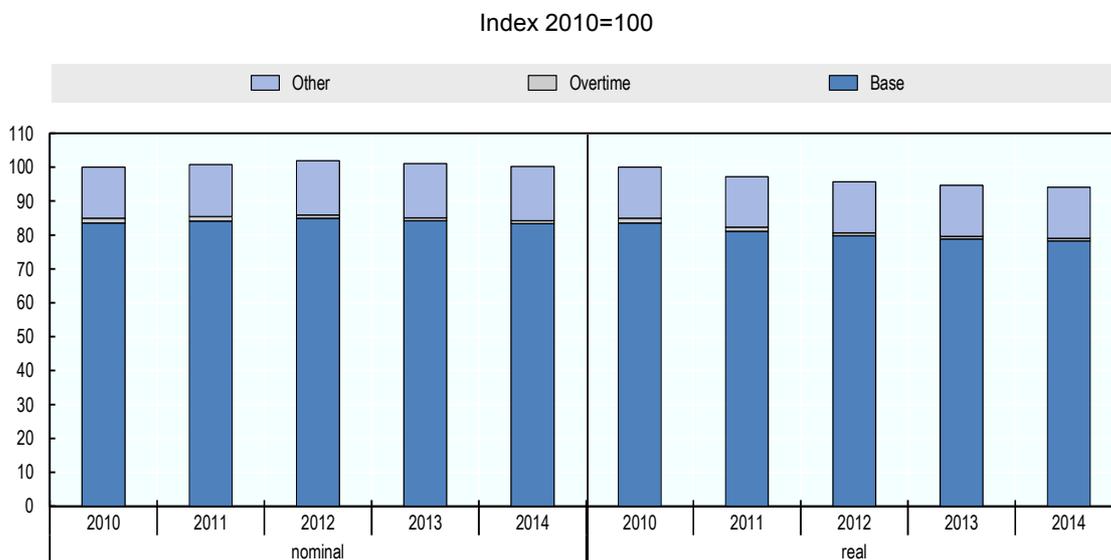
While Portuguese law forbids reductions in the base wage, other wage components can be adjusted. Indeed, Figure A shows that, each year, more than a quarter of workers had reductions in their “other” hourly wages from one year to the next. On average, however, and with the exception of a real fall in 2011, these “other” wages kept on rising both in nominal as well as in real terms (Table A).

Figure A also shows reductions in hourly overtime pay: in 2011, 47% of workers (who worked overtime and remained employed) experienced a reduction in the hourly rate for overtime pay, rising to 65% in 2012 (when the government reduced the rates for overtime work by half), and back to 43% in 2013 and 39% in 2014. Table A shows that the average reduction in hourly overtime pay was 22% in 2012. These figures suggest that the new law had a significant impact on overtime pay (and may have had an important impact on the incomes of some workers). However, from the perspective of firms, this measure will only have had a marginal impact. Indeed, for firms paying overtime to at least one of their employees, the share of overtime pay in the total wage bill was only around 5.2%. Moreover, only about 3.5% of all firms paid overtime to one or more of their employees.

While these findings confirm that firms can, and do, reduce their wage costs during times of crisis by adjusting overtime and other pay,<sup>4</sup> they also show that the impact of these adjustments on total wages were relatively limited. Figure C shows how the average wage paid by a Portuguese firm (estimated as the average wage bill per employee) evolved over the period 2010-2014, sub-divided into its various components. The average nominal wage bill continued to increase modestly in both 2011 and 2012. While there were some small falls in both 2013 and 2014, the total nominal wage bill in 2014 was still the same as in 2010. Despite the important falls in overtime pay discussed above, Figure C shows that these will have made very little difference to firms in practice. Figure C also confirms how, in real terms, the average wage bill per employee fell in each year.

## Box 14. Wages in the private sector during the crisis: Wage moderation and nominal wage rigidity (cont.)

Figure C. Evolution of average wage bill per employee, by wage component, 2010-2014



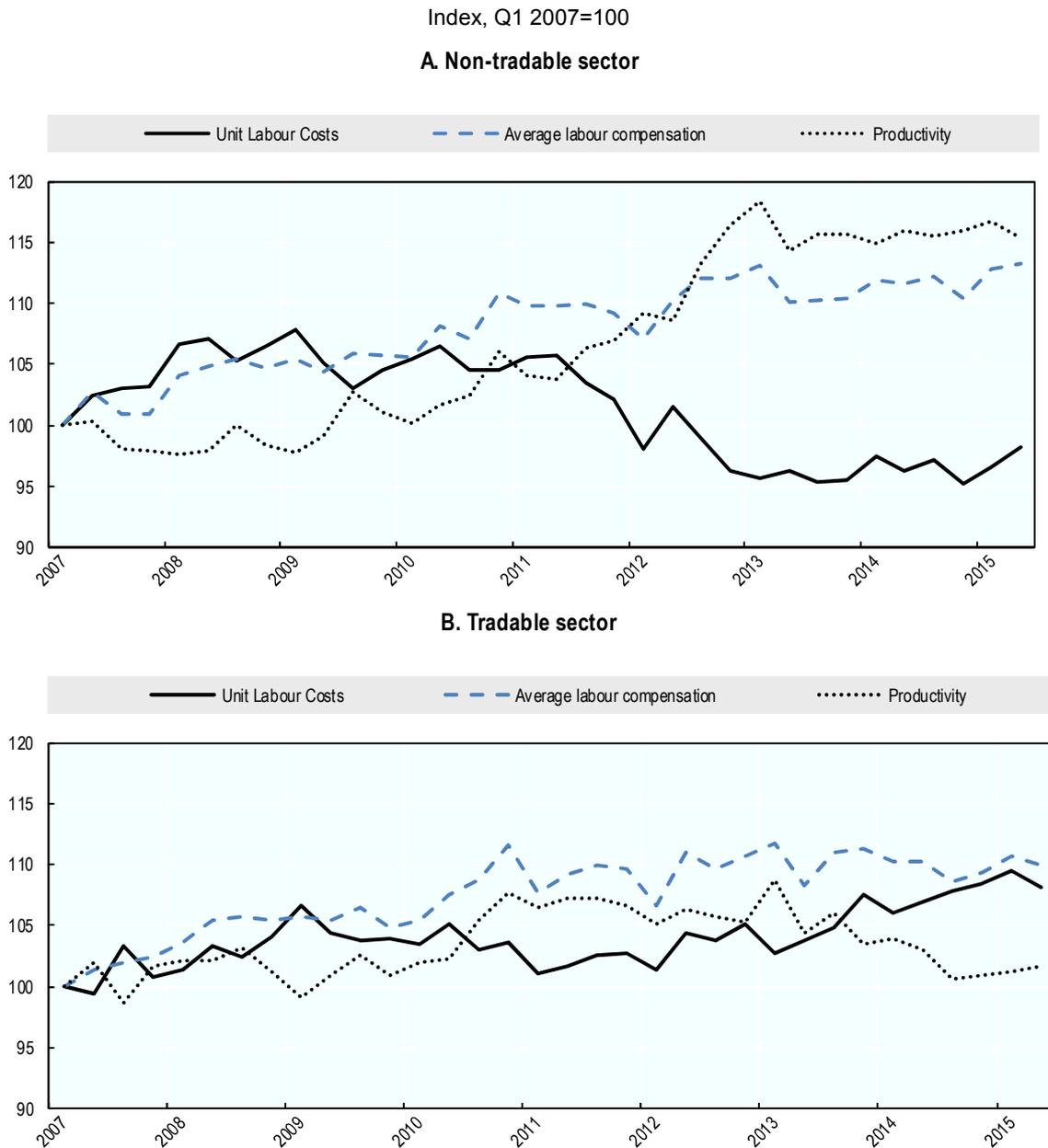
Source: OECD analysis based on the *Quadros de Pessoal*.

1. The *Quadros de Pessoal* is a compulsory census of all non-public firms with at least one employee which is carried out in October each year. The administrative nature of the data ensures a high degree of coverage and reliability, and unique employer and employee identifiers allow the data to be linked from one year to the next.
2. According to the survey discussed in Dias, Marques and Martins (2012), 30% of firms said they hired workers on lower wages than those that had just left in order to cut costs when faced with an adverse shock. Cyclicalities in hiring wages in Portugal was also documented by Martins, Solon and Thomas (2012).
3. Portugal, Carneiro and Guimarães (2010) noted that when Portugal joined the Euro in 1999, the cyclical elasticity of real wages was significantly reduced.
4. A related measure identified by Dias, Marques and Martins (2012) which firms use to cut costs is the less frequent use of promotions. The *Quadros de Pessoal* data indicate that the share of workers who received a promotion nearly halved from 6.2% in 2010 to 3.8% in 2014.

***There has been a slight rebalancing of labour resources from the non-tradable to the tradable sector***

Within the private sector, it is important to distinguish further between the tradable and the non-tradable sectors, since it is the evolution of ULCs in the tradable sector that will matter most to competitiveness. This distinction is made in Figure 31 and shows that the decline in ULCs in Portugal was larger in the non-tradable than in the tradable sector, and that the latter was particularly marked in the years 2011 and 2012. ULCs in the tradable sector also fell somewhat between 2009 and 2012, after which they started increasing again as productivity fell. By contrast, there was a rise in productivity in the non-tradable sector which was partly driven by employment losses, which were larger in the non-tradable than in the tradable sector (see Figure 32). These differences in employment losses (as well as somewhat greater employment growth in the tradable sector) have contributed to the slight rebalancing that happened between the two sectors: the tradable sector's share of business sector employment increased from around 43% between 2005 and 2007 to 47% in the first half of 2015. However, despite this rebalancing of labour resources to the tradable sector, the latter's share remains relatively low in comparison to other European countries.

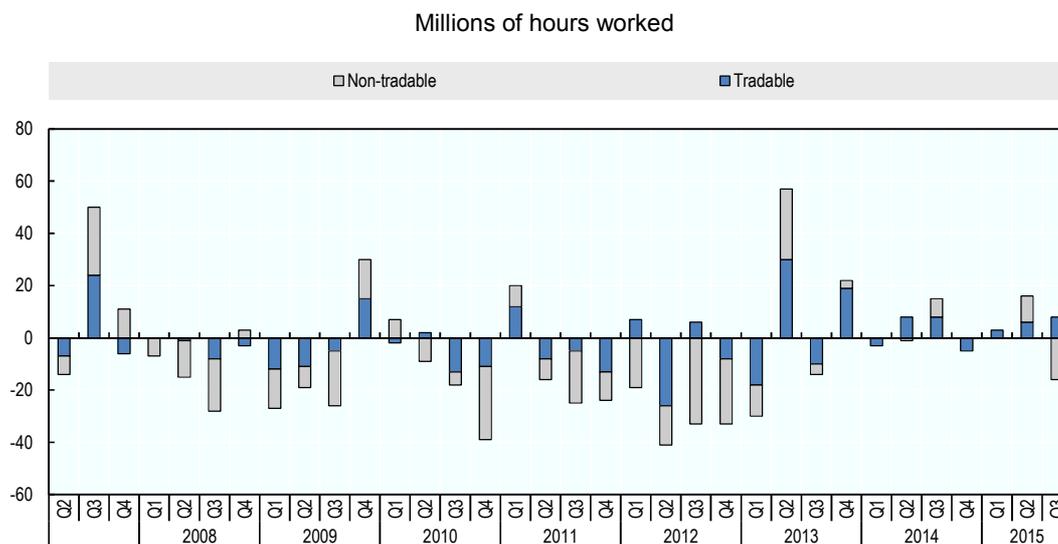
Figure 31. Evolution of quarterly unit labour costs and its components, tradable versus non-tradable sectors, Q1 2007-Q2 2015, Portugal



*Note:* Total labour costs based on hours worked. Data has been deseasonalised. The tradable sector consists of ISIC rev. 4 sectors “Manufacturing”, “Information and communication”, “Finance and insurance activities”, “Professional, scientific and technical activities” and “Administrative and support service activities”, the non-tradable sector of “Mining and quarrying”, “Electricity, gas, steam and air conditioning supply”, “Water supply; sewerage, waste management and remediation activities”, “Construction”, “Wholesale and retail trade; repair of motor vehicles and motorcycles”, “Transport and storage” and “Accommodation and food service activities”.

*Source:* OECD Quarterly National Accounts Database.

Figure 32. **Employment losses in the non-agricultural business economy (excluding real estate), Q2 2007-Q3 2015**



Note: Data has been deseasonalised. The tradable sector consists of ISIC rev 4 sectors "Manufacturing", "Information and communication", "Finance and insurance activities", "Professional, scientific and technical activities" and "Administrative and support service activities", the non-tradable sector of "Mining and quarrying", "Electricity, gas, steam and air conditioning supply", "Water supply; sewerage, waste management and remediation activities", "Construction", "Wholesale and retail trade; repair of motor vehicles and motorcycles", "Transport and storage" and "Accommodation and food service activities".

Source: OECD Quarterly National Accounts database.

### High unemployment has resulted in rising poverty

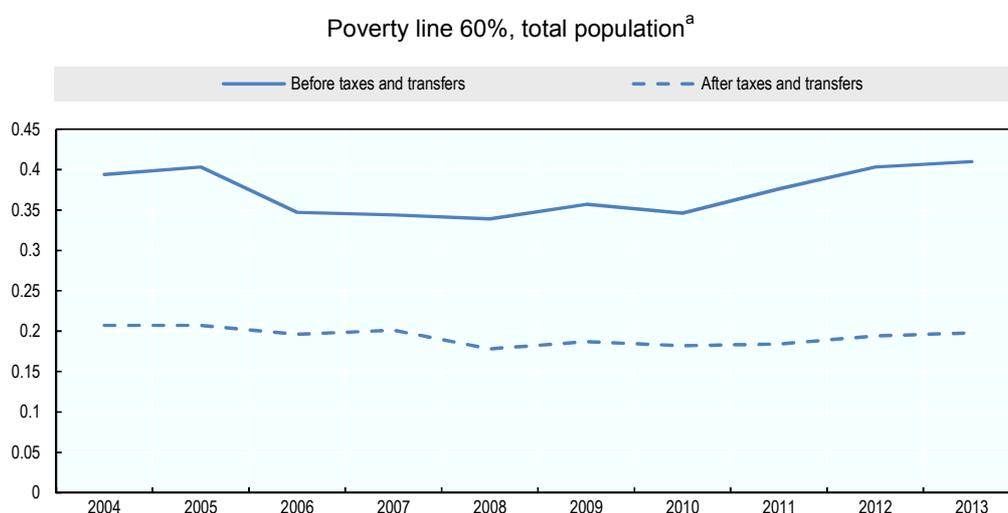
The economic crisis has halted a long-term gradual decline in poverty and, from 2011 onwards, the proportion of individuals living in households with an income below 60% of the median started increasing again (Figure 33). The rise in unemployment has been one of the main contributing factors to this upsurge in poverty (over 40% of the unemployed lived in poverty in 2012), although there is also a substantial share of in-work poverty (10.5% of the employed in 2012).<sup>78</sup>

As Figure 34 indicates, the Portuguese tax-benefit system does a decent job at alleviating poverty: the rise in poverty after taking taxes and transfers is substantially less marked than when these are not taken into account. This is because the tax system in Portugal is very progressive, while transfer payments tend to reduce poverty in a fairly efficient way (Arnold and Farinha Rodrigues, 2015). That being said, it is clear that some other OECD countries achieve even greater reductions in poverty through taxes and transfers, suggesting that there is ample room for improvement in Portugal. This is all the more necessary given that reforms undertaken during the crisis period have resulted in substantial losses in disposable income for the lowest income groups (Avram et al., 2012). In particular, the reduction in generosity of the *Rendimento Social de Inserção* (RSI – social assistance) (the access threshold was lowered and the

78. Analysis carried out for this project using the EU tax-benefit microsimulation model (EUROMOD) model suggests that the increase in poverty between 2007 and 2015 could not be attributed to changes in direct personal taxes (income tax and social contributions) and cash benefits. Simulations applying the 2015 tax-benefit rules on the 2007 population suggest that overall poverty would have been lower in 2007 than it was under the 2007 policy rules. There are some differences by population sub-groups, however. While poverty among adults and the elderly in 2007 would have been lower under the 2015 system, child poverty would have been higher. It is worth noting that the simulations carried out are static and do not take account of any possible behavioural responses to policy changes. It assumes, for example, that the labour supply would not change in response to changes in taxes and benefits.

equivalence scale was made more stringent) resulted in a significant decline in the number of beneficiaries, penalising families with children in particular.<sup>79</sup> Since most of the individuals affected were already below the poverty line, these reforms have not impacted much on measured poverty itself. However, they have made the poor even poorer, with very little fiscal saving.

Figure 33. **Poverty in Portugal, before and after taxes and transfers, 2004-2013**



a. Using the new income definition since 2012. See <http://www.oecd.org/els/soc/IDD-ToR.pdf> for further detail.

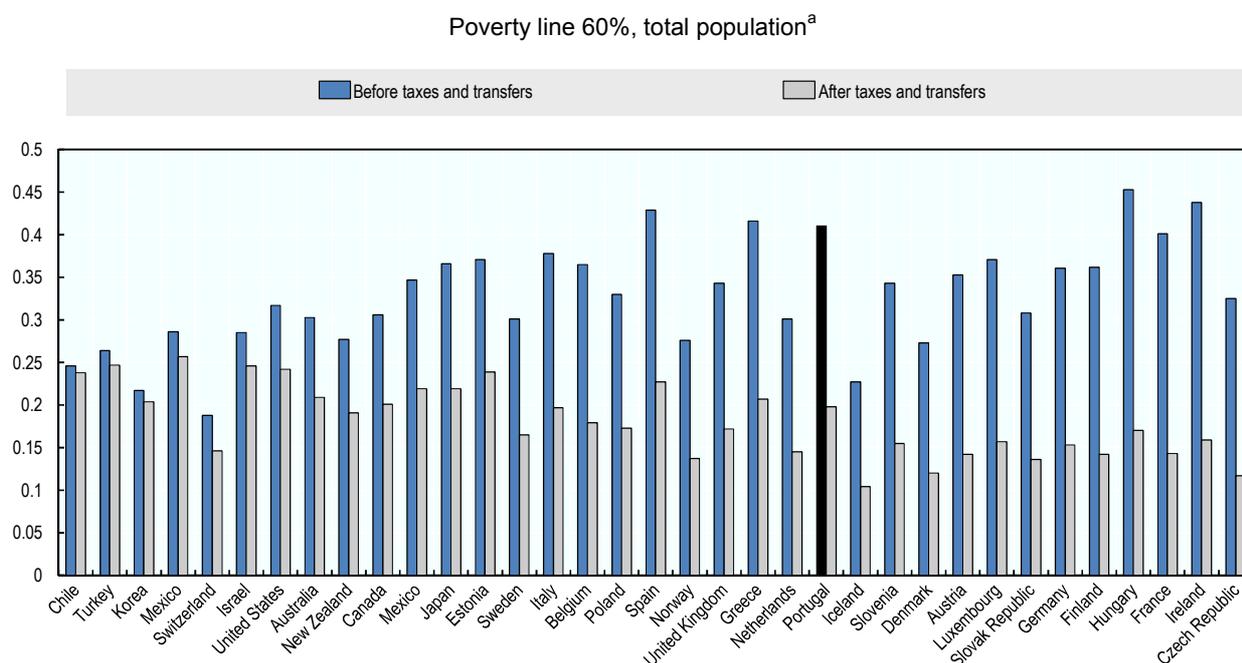
Source: OECD Social Protection and Well-Being Database.

A detailed analysis of how poverty-reducing improvements in the tax-benefit system might be achieved was recently carried out by Arnold and Farinha Rodrigues (2015) and their main recommendations are as follows:

- Given that social expenditures in Portugal are already quite high and that there is limited fiscal space, the priority should be on making existing redistributive policies more efficient as opposed to spending more.
- The benefit system should be rebalanced away from elderly people (who currently receive a disproportionate share of benefit expenditure) and towards families with children instead.
- The efficiency of the benefit system could be enhanced by eliminating benefit overlaps and improving means-testing.
- The RSI threshold should be raised so that more individuals benefit, and more resources should be targeted on children by giving them a more generous weight in the calculation of the benefit. Similarly, raising the means-tested child benefits would be an efficient way of reducing child poverty.

79. The new XXI Constitutional Government established on 26 November 2015 has reversed part of the cuts in generosity of the RSI, which is a welcome development. In particular, the government re-established the weights for dependants and children to their original levels, which was important given the concentration of poverty among children. The reversal of the cut in the income threshold is being done in a phased manner. In 2016, 25% of the cut was reversed; in 2017, another 25% will be restored; and so forth, until the level prior to the cut is fully reinstated in 2019.

Figure 34. Poverty in Portugal and other OECD countries, before and after taxes and transfers, 2013



a. Using the new income definition since 2012. See <http://www.oecd.org/els/soc/IDD-ToR.pdf> for further detail. Data for Mexico, Australia, New Zealand, Japan and Hungary is for 2012. Countries are ranked in increasing ratio of poverty before taxes and transfers over poverty after taxes and transfers.

Source: OECD Social Protection and Well-Being Database.

### Increased labour market insecurity has led to a fall in job quality

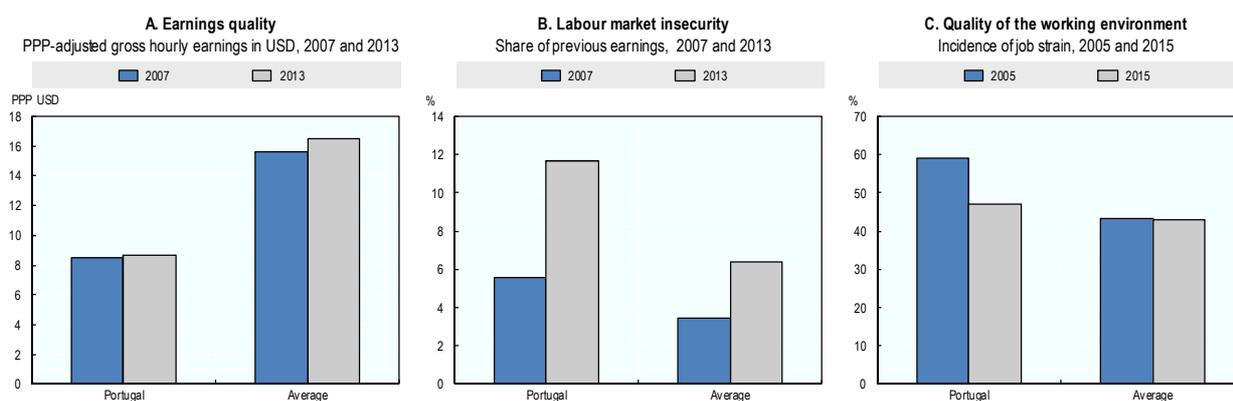
While having a job is an important determinant of well-being, the quality of that job matters as well. At various points throughout this report aspects of job quality in Portugal have been discussed, including: earnings, the risk of unemployment and the generosity of unemployment benefits. However these, as well as other measures of job quality, can be usefully summarised by the OECD's job quality framework (OECD, 2014b) which focuses on the outcomes for workers in three broad and complementary areas that are most important for their well-being:

- *Earnings quality*, which captures the extent to which earnings contribute to workers' well-being in terms of average earnings and their distribution across the workforce.
- *Labour market security*, which captures those aspects of economic security related to the risks of job loss and its economic cost for workers. It is defined by the risks of unemployment and benefits received in case of unemployment.
- *The quality of the working environment*, which captures non-economic aspects of jobs including the nature and content of the work performed, working-time arrangements and workplace relationships. These are measured as the incidence of job strain characterised as high job demands with low job resources.

Across all three dimensions of job quality, Portugal performs worse than the OECD average – and this is true both before and after the financial crisis (Figure 35). The evolution of job quality over the crisis is mixed in Portugal. The greatest negative impact has been on labour market security, which reflects the

large upsurge in unemployment. At the same time, earnings quality has more or less stagnated – which is consistent with the analysis presented earlier on in this chapter. For those who remained employed, however, there has been a marked decrease in the incidence of job strain and, therefore, an increase in the quality of the working environment. This will partly reflect a selection effect, given that those in worse quality employment were more likely to have lost their job during the crisis.

Figure 35. Job quality in Portugal and the OECD, 2005-2015



Note: The average excludes: Turkey, Slovenia and Luxembourg in the case of earnings quality; Chile in the case of labour market insecurity; and Australia, Canada, Chile, Iceland, Israel, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey and the United States in the case of quality of the working environment.

Source: OECD Job Quality Database (2016).



### CHAPTER 3

## POLICY PRIORITIES FOR ACHIEVING BETTER LABOUR MARKET OUTCOMES IN PORTUGAL

This final chapter offers some thoughts on the road that lies ahead. The labour market reforms carried out over the past few years in Portugal were comprehensive and, as argued in this report, it will take time for their full effects to become both visible and entirely understood. In this sense, the present report should be seen only as a preliminary assessment of those reforms. That being said, it is possible, even at this stage, to make some observations about key policy priorities for the future. While most of these will require further reforms of labour market institutions, policies and practices, achieving higher levels of employment and greater inclusiveness in Portugal will also depend on factors that lie outside the realm of labour market policy. These include first and foremost the need to return to higher and more sustainable levels of growth, but also, amongst others: further investments in skills, product market and tax reforms, and improving the access that firms have to credit.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

## Labour market policy: The road ahead

### *Employment protection legislation on permanent contracts should be further eased*

The EPL reforms described in Chapter 1 made it clear that Portugal, despite tremendous progress in recent years, remains the country in the OECD with the most stringent regulations around individual dismissal of workers on permanent contracts. Portuguese employers are therefore likely to continue to think twice before they hire a worker on a permanent contract, and may still prefer lower-cost and more flexible temporary contracts instead. Labour market duality is therefore likely to remain a distinctive feature of the Portuguese labour market in years to come, unless even more is done to reduce the gap in employment protection between the two types of contract. A comparative analysis with other OECD countries highlights a few areas where Portugal's legislation still stands out:

- First, *procedural requirements* in the case of individual dismissal of workers on permanent contracts remain high, including notification procedures and the delay involved before notice can start. Easing such requirements would not only bring Portugal's legislation more in line with that of other OECD countries, it would also help to narrow the gap with temporary contracts, where no such requirements are set.
- Second, while Portugal reduced severance pay in the case of fair dismissal, *compensation following unfair dismissal* remains amongst the highest in the OECD. The highest typical compensation (in terms of months of former pay) for unfair dismissal of an employee with 20 years of job tenure can be found in: Sweden (32 months), Italy (estimated at 21 months), China (20 months), Portugal (17.5 months) and France (16 months). These amounts are particularly high if compared with the OECD average, which is close to six months.
- Last but not least, Portugal remains one of the few countries (along with Austria, the Czech Republic and Korea) where *reinstatement* after unfair dismissal is almost always granted or offered to the worker (except in cases of procedural irregularity). OECD (2013b) showed that restricting the possibility of reinstatement has been one of the main policy interventions across OECD countries since 2008 and also that such trend is justified on the basis that reinstatement is one of the aspects of EPL which most affects gross worker flows, and job-to-job flows in particular.

One fundamental barrier to further lowering EPL on permanent contracts in Portugal is Article 53 of the Portuguese Constitution which guarantees “job security” and prohibits dismissals without “just cause”, yet fails to define what the latter means.<sup>80</sup> A very conservative interpretation of this article has significantly restricted the definition of what constitutes a fair dismissal (i.e. disciplinary reasons) and has put the onus on the employer to prove that maintaining the work relationship is practically impossible. It is this narrow interpretation which has frustrated attempts to revise the definitions of fair dismissal during the recent reform period. This restrictive definition of what constitutes a fair dismissal significantly increases the risk of litigation for the employer (and of reinstatement and the payment of compensation) following the dismissal of a worker. It therefore impedes the efficient (re)allocation of labour resources.

Moving forward, it would therefore be particularly important to clarify the conditions under which companies can dismiss workers on permanent contracts for economic reasons. Such reforms were recently undertaken in both Spain and France. In Spain, since the 2012 labour market reform, a dismissal is always justified if the company faces a persistent decline (over three consecutive quarters) in revenues or ordinary income. In addition, and perhaps more importantly, the firm does not have to prove that the dismissal is essential for the future profitability of the firm (OECD, 2013b). In France, since the 2016 labour market

80. For a comprehensive discussion of the interpretation of Article 53 of the Portuguese Constitution, see Phalempin (2014).

reforms, a dismissal on economic grounds will be justified if sales or orders fall for: four consecutive quarters in comparison to those of the previous year for firms with 300 or more employees; three consecutive quarters for firms with at least 50 but fewer than 300 employees; two consecutive quarters for firms with at least 11 but fewer than 50 employees; and one quarter for firms with fewer than 11 employees.

In Portugal, clarifying the conditions under which employers can dismiss workers on permanent contracts for economic reasons would probably require a change to the Constitution (Article 53) – which might not be easy to achieve. Nevertheless, further reductions in employment protection legislation for workers on permanent contracts can still be achieved by: lightening the procedural requirements for dismissal, reducing the compensation following unfair dismissal, and lowering the probability of reinstatement. A pragmatic solution to achieve the latter objective could be modelled on the approach taken in Germany. While severance pay in Germany is not mandatory, most employers do offer it, and employees who accept this severance pay forego their right to go to court. In Portugal a similar system could be introduced whereby employees who are dismissed have a right to (ordinary) severance pay only if, within a certain time period, he/she does not bring the case to court. This approach would reduce some of the risk and uncertainty for the employer.

Labour market duality could also be reduced through other means – e.g. by making hiring on temporary contracts relatively more expensive than hiring on permanent contracts. This could be achieved by charging higher social security contributions on temporary contracts (as was done in Slovenia, France and Italy, for example). While this will likely help reduce labour market segmentation, there is a risk that higher labour costs would reduce employment, particularly for the more marginal workers (Cahuc et al., 2016). Therefore, one may wish to waive these higher social security contributions when firms hire marginal workers (e.g. low-skilled, youth and the long-term unemployed). Also, higher social security contributions on temporary contracts may pose a particular challenge for sectors that rely heavily on seasonal workers (e.g. agriculture and tourism).

The report has also argued that the system of severance pay in Portugal could be reformed further to emulate the one of Austria. In that system, workers accumulate rights to severance pay into individual savings accounts which are transferable from one employer to another, or can be transformed into a cash payment or annuity upon retirement. The advantage of this system is that it removes the disincentive to worker mobility inherent in systems where severance pay entitlements are strictly linked to the current employer. That being said, the advantages of increased portability will need to be carefully weighed against the additional cost of running such a scheme – particularly if it falls on employers.

A final observation relates to the direction of future reforms, which should be aimed primarily at reducing the stringency of employment protection legislation on permanent contracts, rather than on making hiring on temporary contracts more difficult and costly. Indeed, as pointed out in OECD (2014b), making hiring regulations on temporary contracts too restrictive might be counterproductive, by increasing perceptions of job insecurity for those workers who are unable to use non-regular contracts as a stepping-stone into open-ended ones. It is on the difficulty of firing permanent workers that Portugal stands out compared to other OECD countries, not on the difficulty of hiring temporary ones.

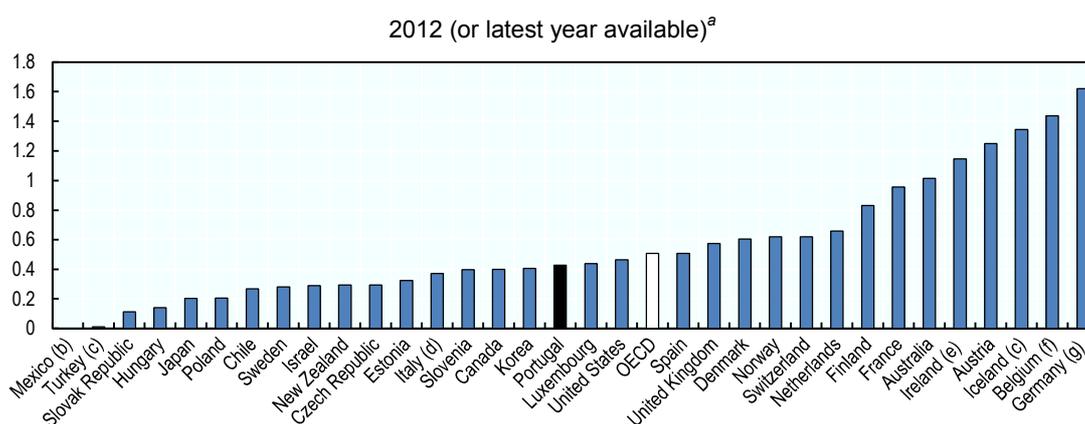
***Coverage of unemployment benefits should be increased, but their maximum duration further reduced***

The reforms of unemployment benefits in Portugal were a move in the right direction. Access to unemployment insurance was eased and coverage held up well despite a substantial increase in the number of unemployed (and, in particular, in the number of long-term unemployed and individuals with short contribution histories). In order to fight long-term unemployment, both the replacement rate of

unemployment insurance and the maximum duration of benefits were reduced, which brought the Portuguese system more in line with OECD norms.

Despite these positive steps, coverage of the unemployed in terms of unemployment insurance or assistance remains modest in Portugal compared to other OECD countries (Figure 36). In 2012, the ratio of beneficiaries to the number of unemployed stood at 0.43 in Portugal, compared to 0.52 across the OECD on average (and below the coverage rates for countries like Spain and the United States). Going forward, further improving coverage should be a priority for the Portuguese Government and a key challenge will be to cover young people and others with incomplete contribution records (e.g. those on non-regular employment contracts). Self-reported data from the EU-LFS suggest that, in 2013, fewer than 5% of unemployed youth in Portugal said they received benefits or assistance, compared to over 40% of adults. Another, related issue is that access to unemployment assistance in Portugal has been falling gradually over time because the means test threshold (80% of the IAS) has not been updated since 2009. Increasing this threshold would help raise the coverage of unemployment assistance in a targeted way. Finally, while those who are not (or no longer are) eligible for unemployment assistance may be eligible for the last-resort RSI income support, access to this benefit itself has reduced over time (see discussion at the end of Chapter 2).

Figure 36. Ratio of unemployment insurance/assistance beneficiaries to LFS unemployed, 2012



- 2011 for Chile, 2010 for Iceland.
- In 2012, there was no unemployment insurance or assistance in Mexico.
- In Turkey and Iceland, some programmes included in the total are partially missing. Consult the country note for details: <http://www.oecd.org/social/recipients.htm>.
- In Italy, recipients of the *Cassa Integrazione Guadagni* (CIG) are not included (even those who did not work at all).
- In Ireland, all recipients of unemployment benefit are included, even those who work very few hours.
- In Belgium, recipients of unemployment insurance aged over 65 are included.
- In Germany, the number of beneficiaries of unemployment assistance is usually expressed in terms of the number of family members that benefit (not just the unemployed individual). In order to make the estimates for Germany more comparable to those of the other OECD countries, the graph counts the number of families (and not family members) that receive unemployment assistance.

Notes: In some countries the ratio of beneficiaries to unemployed can exceed one because entitlements to unemployment assistance are not necessarily based on ILO definitions of unemployment. The OECD average is calculated assuming ratios of 1 in all those countries where they exceed 1.

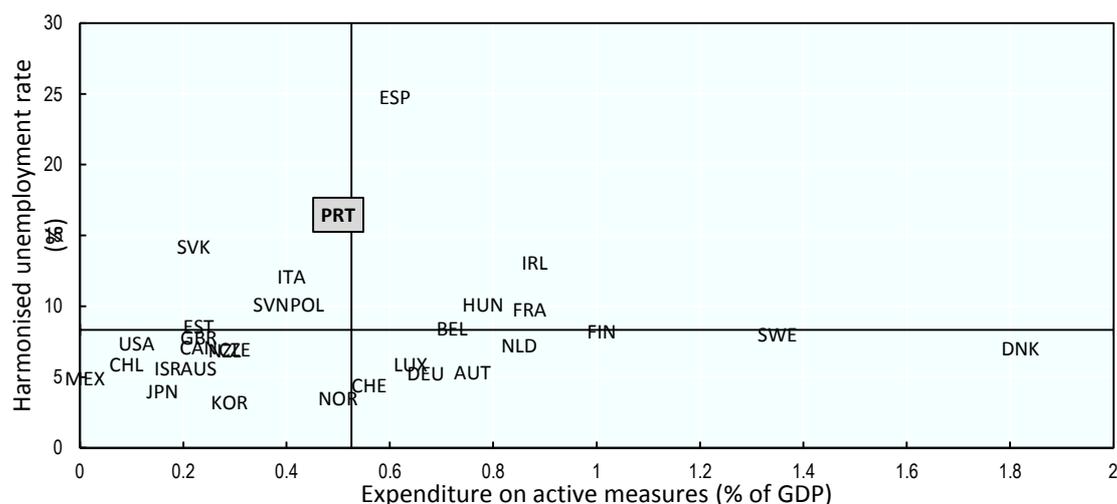
Source: OECD Social Benefits Recipients Database.

As has already been mentioned, there is also scope for further shortening the maximum duration of unemployment benefits in Portugal, which would help reduce the high rate of long-term unemployment (and would also free some resources which could be ploughed back into funding higher coverage rates). This is an issue for older workers in particular, who face the highest incidence of long-term unemployment (Portugal et al., 2015). In most OECD countries maximum benefit duration is age-related (either directly or through the link with previous work experience) and this may be justified on the basis that older workers tend to face worse re-employment prospects when they become unemployed. However, there is a risk that unemployment benefits are used as a pathway to early retirement and the incentive to exit unemployment is likely to fall as retirement nears (Tatsiramos and van Ours, 2012). Going forward, Portugal should consider further reducing the maximum duration of unemployment benefits, particularly for older workers. This should include restricting the possibility of extending unemployment assistance until the age of retirement to only those older people who remain unemployed despite taking active steps to find work. Further reforms of unemployment benefit duration should be combined with efforts to reinforce employment programmes to support the reintegration of job seekers into employment (see below).

***Reforms of the Public Employment Service should be completed, and activation measures targeted on those who need most help***

As the discussion in Chapter 1 showed, Portugal implemented various measures to strengthen its activation strategy over the past few years. Going forward, it is important to build on these successes to further improve the way the unemployed are helped, supported and encouraged to move into rewarding and productive jobs. In particular, Portugal needs to ensure that the measures outlined in the *Programa de Relançamento do Serviço Público de Emprego* are fully implemented. There may also be a need to dedicate more resources to activation. While this may be difficult in the current fiscal climate, it should be remembered that such spending can bring important savings in terms of reduced expenditure on benefits, as well as increased tax revenues. While Portugal's current spending on active measures (as a proportion of GDP) is very close to the OECD average, there are many countries with much lower unemployment rates that spend considerably more (Figure 37). There are also some efficiency gains to be made, for example by better targeting the measures on those who need them most, or by taking a bolder approach to the digitalisation of PES services (European Commission, 2015).

Figure 37. Unemployment and expenditure on ALMPs, 2013



Note: 2010 instead of 2013 for the United Kingdom. 2011 instead of 2013 for Israel. 2012 instead of 2013 for France, Korea, New Zealand, Poland and Spain.

Source: OECD Short-Term Labour Market Statistics Database and OECD Labour Market Programmes Database.

Another interesting recommendation to come out of the Portuguese evaluation literature on active labour market programmes is that the authorities should aim to achieve more stability in the measures available to jobseekers. Writing back in 2012, Costa Dias and Varejão already noted that, between 2000 and 2011, the Public Employment Service offered 167 different programmes, which were often small variations of one another or of previous programmes. As the tables produced in Annex A of this report testify, this continuous change in ALMPs on offer continued over the crisis period, which makes it difficult for jobseekers and firms to know what help is available and also costly for the PES to have to adapt each time to a new set of tools. At the same time, there is a need for more monitoring and evaluation of the existing measures.

Finally, Portugal could try and build stronger incentives into ALMPs to reduce labour market duality. For example, some OECD countries train the unemployed to fill existing vacancies and, in return, expect the employer to hire the individual on a permanent contract (e.g. Individual Job Training in Flanders, Belgium and Work and Income Support in New Zealand). A similar approach could be tried in Portugal – although there is a possibility that such conditions reduce take-up by employers if the risks and costs of taking on an unemployed person on a permanent contract are perceived as being too great. In addition, some of Portugal's existing ALMPs already offer greater subsidies to employers if they hire on permanent contracts (e.g. *Medida Estímulo Emprego* and its predecessors *Estímulo* and *Apoio à Contratação via Reembolso da TSU*). It is important that the effectiveness of such measures be evaluated first, before new measures are introduced.

***The collective bargaining system should promote a closer alignment between wages and productivity at the firm level***

The Portuguese experience has shown that putting restraint on the use of administrative extensions of collective agreements during times of crisis may help achieve wage moderation, preserve jobs and restore competitiveness. There is, of course, a role for extensions of collective agreements, particularly during times of healthy economic growth: they reduce wage inequality as well as gender pay gaps (Villanueva, 2015) – and this is one of the reasons many OECD countries have legal provisions in place for them. However, most of these countries also impose rules on the representativeness of collective agreements before they can be extended and, in Portugal, this is an issue that should continue to be monitored closely. While the first condition requiring signatory employers to represent 50% of workers in the sector/occupation/geographical area was too stringent, the second condition which allows extension when 30% of signatory firms are small and medium enterprises is too lax, given that 99.7% of firms in Portugal are SMEs. It would make sense, therefore, to continue revising these criteria so that they are challenging (and therefore encourage employer organisation), as well as realistic.

The key issue with quasi-automatic extensions of collective agreements is that they risk imposing conditions on non-signatory firms which do not reflect their own economic and financial circumstances. This can be particularly damaging in cases (like in Portugal) where: i) the employer organisations and trade unions that negotiate the agreement are not representative of the sector/occupation/region to which the agreement is to be extended; and ii) where the law prohibits nominal wage cuts. Indeed, there is evidence that, in Portugal, the indiscriminate use of extensions has harmed both competitiveness and employment. One possibility going forward would be for the government to extend collective agreements only if they meet certain “public interest” criteria. What exactly these criteria are can vary, depending on economic circumstances. The important thing is that they are announced well in advance by the government, so that the negotiating parties can take them into account during the bargaining process – knowing that, if these criteria are not met, no extension of the agreement will be possible. In the late 1990s in the Netherlands, for example, the minister (successfully) put pressure on the social partners to set the lowest pay scales close to the national minimum wage. By making clear that this measure was intended to save the credibility of extensions, the minister managed to convince the central organisations to influence their affiliates and negotiators to adjust the lowest pay scales.

Another option for limiting the potential negative effects of extensions would be to make them conditional on the inclusion of an opening clause in the original agreement. Such clauses, negotiated by the social partners, would allow companies to deviate from certain sectoral minima or standards under conditions specified in the higher-level agreement. Such firm-level bargaining under the umbrella of a sectoral agreement is common in Scandinavia, as well as in large firms in Germany and France (Visser, 2016). In the case of Germany, some research found that where collective agreements contained opening clauses, firms had lower job reallocation rates, lower job destruction rates and higher job growth rates (Brändle and Heinbach, 2013) – the reason being that opening clauses give firms more flexibility to save jobs through increased flexibility.

It is important, however, that opening clauses, when activated, are done so upon agreement between employers and their worker representatives. An increased use of derogation should therefore go hand-in-hand with measures to improve worker representation at the firm-level, which would strengthen the control function and reduce the risk of abuse by employers. While in most countries unions have tended to oppose the use of opening clauses for fear that it would entail an erosion of their influence, the increased use of such clauses could actually mean that unions have to strengthen their direct engagement with the needs and requirements of employers (Keune, 2010). Opening clauses also increase the likelihood of organised (as opposed to disorganised) decentralisation and, in the context of increased globalisation and declining union membership, they could be seen as a way to stabilise the bargaining system. In Germany, for example, this was the view of the Mining, Chemicals and Energy Industrial Union (Keune, 2010). That being said, opening clauses may also increase conflict between management and workers, and clear and swift procedures should be put in place to resolve potential disagreement. One way of doing this will be suggested below when the temporary withdrawal from collective agreements for “inability-to-pay” or “hardship” will be discussed. Another is to make sure that the conditions under which firms may opt out are clear and objective.

Whether Portugal opts for the use of public interest criteria or the increased use of opening clauses, it may also want to consider introducing an independent body or committee responsible for deciding (or advising the government on) whether an extension should be granted. Such bodies exist in both Finland and Germany, and play a similar role to minimum wage committees in that they distance the decision to increase wages from the political arena. In Germany, this committee consists of three trade union and three employer representatives (from sectors other than the one covered by the agreement), and extensions are granted only if a majority of at least four votes is achieved (Eurofound, 2011). As in minimum wage committees, this body could also include experts.

While increased worker representation would increase the control function in case opening clauses were introduced, it would also help resolve another bottleneck in the Portuguese collective bargaining system, which relates to the possibility of firm-level bargaining. While the most recent reforms in Portugal have attempted to extend the possibility of firm-level bargaining to a greater number of firms, this is unlikely to make much difference in practice because of the poor worker representation in Portuguese firms. Improving worker representation can be achieved by making works councils compulsory in companies of a certain size (as they have done in France with the *Comités d'Entreprise*). Another option is to provide financial incentives. In Italy, while not promoting worker representation *per se*, social security and tax breaks have been introduced for wages negotiated at the firm-level.

In addition to general opening clauses, more flexibility at the firm-level can be achieved through “inability-to-pay” (or “hardship”) clauses which allow employers to temporarily suspend a collective agreement at times of crisis. These are different from the general opening clauses discussed above, which are primarily instruments of organised decentralisation within sectoral agreements and have no place in firm-level agreements (Visser, 2016). By contrast, temporary hardship clauses can apply to any collective agreement at any level and act as a safety valve for employers (Visser, 2016). Late in 2014, Portugal

introduced the possibility of temporary hardship clauses. As with the more general opening clauses, however, an issue arises of how disagreement between employers and worker representatives is resolved – which, if left unaddressed, risks reducing the practical applicability of such clauses. To minimise such disagreements, either the law or collective agreements should include objective conditions under which employers may temporarily suspend a collective agreement. In Spain, for example, sectoral agreements have to include objective conditions (such as a fall in sales or productivity over a specified period of time) that specify when firms may opt out of what was agreed. In addition, a swift arbitration process in the case of disagreement between employers and worker representatives. Again, the example of Spain could be followed, where employers wanting to opt out can now, in the absence of an agreement with workers' representatives, unilaterally refer the matter to arbitration by a public tripartite body. Importantly, once the issue has been settled by arbitration, it may no longer be challenged (except on some very limited grounds; OECD, 2012). Such arbitration could also be used in the case of disagreement about the activation of standard opening clauses discussed above.<sup>81</sup>

Finally, it will be important in Portugal to improve trust between the social partners. Evidence from the Global Competitiveness Report, which gathers the opinions of business leaders around the world, suggests that trust in social partners in Portugal is consistently lower than across the OECD on average. The crisis years, and the reforms and austerity measures that were implemented during those years, have put significant strain on the relationships between the social partners. Távora and González (2014) provide a comprehensive overview of the strikes and demonstrations that took place during this period which include several general strikes, of which three were organised by the two union confederations “in an (almost) unprecedented display of unity of the Portuguese labour movement” (Távora and González, 2014). The main union confederation (CGTP) refused to sign any agreement with the government. In some cases (e.g. the fixing of the statutory minimum wage in 2011), the social partners were not even consulted by the government. At the same time, the issue of trust is gaining growing attention as an important determinant of the outcome of the collective bargaining process (Addison, 2015), and some researchers, like Blanchard, Jaumotte and Loungani (2013), have argued that “trust among the social partners appears to be just as important in bringing about macro flexibility as the structure of collective bargaining.” This was already recognised by Freeman and Medoff (1984), according to whom good labour relations are more likely to result in positive performance outcomes. While building trust between social partners is a complex process, implementing some of the reforms put forward by this report would help, including: making unions and employer organisations more inclusive; introducing objective criteria for both extensions and opt-outs; and encouraging regular negotiations (e.g. by reducing the maximum length of time for which agreements can remain valid) (Hijzen, Martins and Parlevliet, 2016).

### ***Minimise the possible negative employment effects of future increases in the minimum wage***

Chapter 1 argued that the freezing of the minimum wage between 2010 and 2014 hurt workers and that, in 2013, minimum-wage workers needed to work a relatively high number of hours to be able to move above the relative poverty line. At the same time, the Portuguese minimum wage is high relative to median wages and is also very binding: in October 2014, it was estimated that one in five full-time workers was earning the minimum wage, which was up from 13% in April that same year (GEP, 2015). Of particular concern in Portugal is that employer social security contributions on minimum-wage workers tend to be higher than in other countries, which would exacerbate any negative effect of the minimum wage on hiring. Given that Portugal continues to struggle with competitiveness (Chapter 2), the raising of the minimum wage to EUR 530 in 2016 and to EUR 600 by 2019 should raise some alarm bells. While some reductions in employer social security contributions for existing minimum wage workers will continue to

81. One concern, as pointed out by Ramalho (2013) is that in Portugal “There [...] appears to be no tradition of resolving differences of opinion between parties in regard to collective agreements and collective bargaining by means of mediation and arbitration.”

be available, the next section of this chapter will argue that, in order to stimulate labour demand, this measure should be extended to all minimum wage workers (not just existing ones). This may be particularly important in the case of small firms since these are likely to bear the brunt of any minimum wage increase (GEP, 2015).<sup>82</sup>

An alternative (or, rather, complementary) way of supporting the incomes of low-wage workers is through in-work benefits. Indeed, a recent review of minimum wage policy in OECD countries concluded that a careful combination of minimum wages and in-work benefits can be more effective in tackling in-work poverty than either instrument on its own (OECD, 2014b). The advantage of in-work benefits is that they have no negative effect on labour demand. Their introduction would however put additional pressure on the public purse, which may not be feasible given the current fiscal climate in Portugal. An additional concern often raised with in-work benefits is that they would simply be off-set by lower wage increases, but this risk is mitigated for the lowest earners by the presence of the minimum wage. Indeed, one of the stated aims of introducing the UK National Minimum Wage, for example, was to ensure that in-work benefits would actually increase the incomes of workers (rather than being “pocketed” by employers who might reduce wages by a similar amount). In addition, there is no need for employers to know which employees applied for and received the in-work benefit (as is the case in the United States with the Earned Income Tax Credit). Finally, while Portugal may not currently have an in-work benefit or tax credit along these lines, it should be remembered that the tax system in Portugal is very progressive which, to all intents and purposes, is a functional equivalent (except, perhaps, that it is less targeted than in-work benefits can be).

Looking forward, Portugal should consider setting up an independent body responsible for providing the government with impartial advice on future changes to the minimum wage, based on up-to-date and accurate information on current labour market conditions and the views of social partners. Such bodies, which bring together labour market experts, employer and employee representatives, now exist in different forms in several OECD countries, including: Australia, France, the United Kingdom and several US states. They have the advantage of making the minimum-wage uprating mechanism more fair, open and transparent.

### **Other challenges**

#### ***Returning to higher and more sustainable rates of growth***

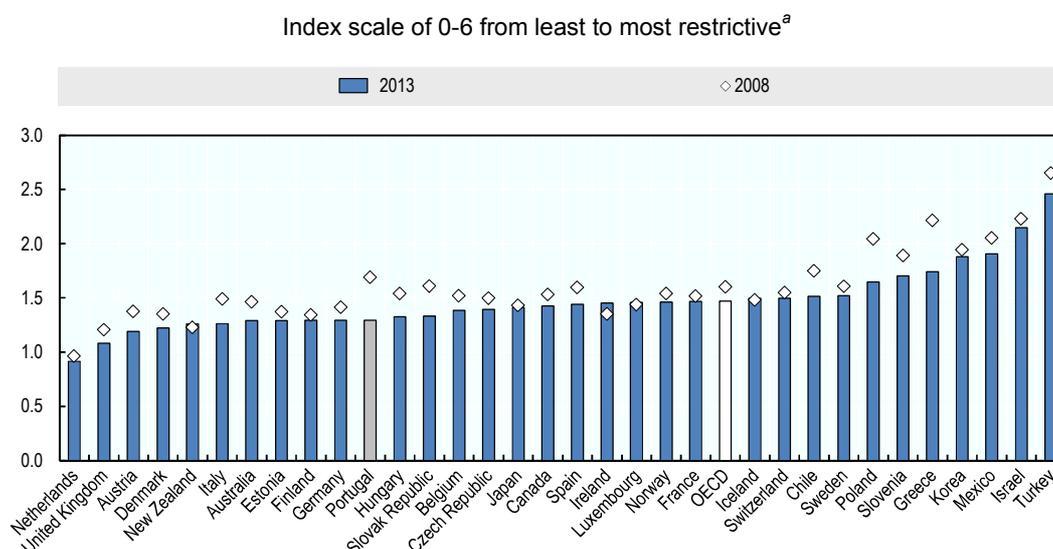
A return to higher and more sustainable growth remains a critical condition for further improvements in the labour market. Projections by international organisations, including the OECD, expect a continuation of the economic recovery in Portugal with growth rates in the range of 1.25% in 2017 and 2018. This implies that growth will remain substantially below the average growth rates projected across the OECD. Based on these projections, the pace of the recovery in Portugal would probably allow further reductions of the unemployment rate, albeit only small ones.

#### ***Pushing through further product market reforms***

Economic growth can be held back by product market regulations that put frictions on the entry and expansion of firms. Since 2008, Portugal has implemented a wide range of measures to strengthen the competition-friendliness of its product market regulation and has moved up 15 ranks among OECD countries. For the aggregate indicator, Portugal is currently ranked 11th of 33 OECD economies for which data is available (Figure 38).

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82. There is also a concern that a high national minimum wage floor may undermine future collective agreements, since employers will be less willing to negotiate increases in wages when the national minimum wage is already so high.

Figure 38. **Aggregate product market regulation indicator, 2008-2013**

a. The OECD aggregate is an unweighted average of the data shown.

Source: OECD (2013), OECD Product Market Regulation Database.

However, while markets for tradable goods are generally competitive in Portugal (as is to be expected in a small open economy), some non-tradable sectors such as energy, transport and professional services continue to be characterised by low levels of competition. Given that intermediate inputs from non-tradable sectors are one of the most important cost inputs for firms in the tradable sector, the scope for further competitiveness gains and enhanced export performance depend crucially on the economy's ability to restrain input prices.

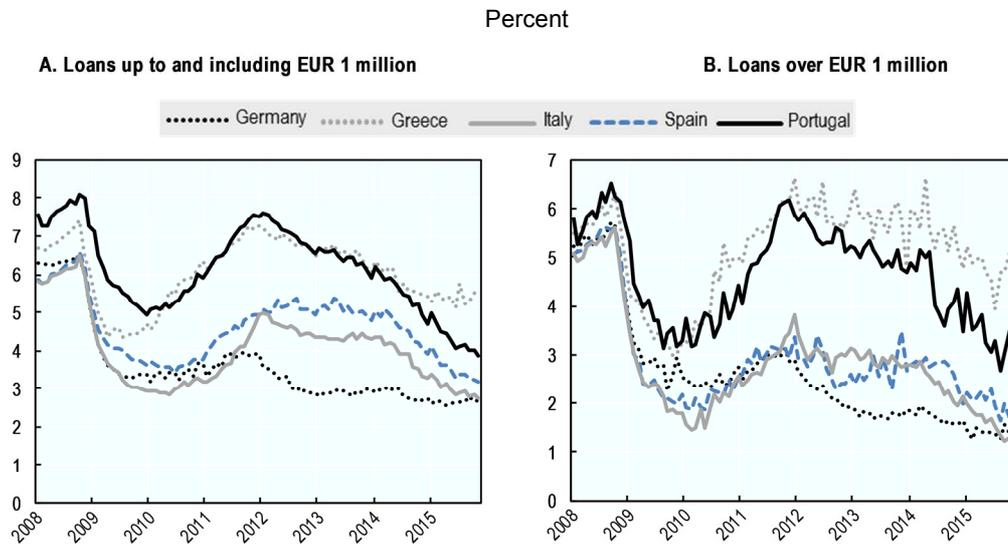
Recent OECD simulations (OECD, 2014c) suggest that further reductions in regulatory barriers to competition could significantly boost growth rates in Portugal. For example, in a scenario where Portugal reduces such barriers by 20% (corresponding roughly to the magnitude of changes observed over the past ten years in those OECD countries that have implemented product market reforms), GDP would increase by an additional 2% by 2020. In a more ambitious scenario in which Portugal aligns its regulation to best practice among all OECD countries in the various areas and sectors of product market regulations would yield an increase in the level of productivity and GDP of 5.5% by 2020, and even more over the longer term.

Going forward, it is therefore essential that Portugal continues to look for ways to improve its product market regulation which, in turn, will allow firms in other sectors to benefit from better inputs at lower prices, as well as better quality products and services. While a new framework law was approved in 2013 that reforms regulations in 18 professional services, none of the new statutes and internal rules for the professional bodies have been approved yet (nine have reportedly been finalised but not yet approved, while nine others are experiencing delays – European Commission, 2015). Similarly, some measures aimed at reducing the cost of energy and the use of transport infrastructure still need to be implemented.

### ***Improving access to credit for firms***

Job creation in Portugal has been held back also by financial constraints weighing on firms. Although the cost of credit in Portugal has been falling substantially, it remains high compared to some other OECD countries, including Italy and Spain (Figure 39) and, for large loans, recent data indicate that interest rates might be rising again. Against this backdrop, lending to the private sector still continues to fall, although at a decreasing rate (Figure 40). One of the issues that may have to be addressed to enhance access to finance for firms with strong growth potential is the high level of corporate indebtedness and the poor performance of some assets on banks' balance sheets, which is restraining their lending capacity.

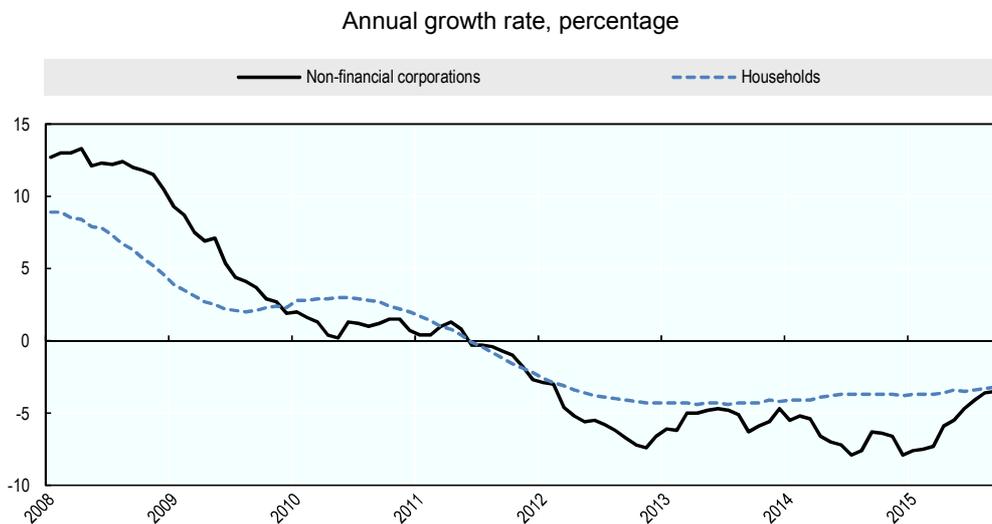
Figure 39. Interest rates on loans to non-financial corporations, January 2008–November 2015, Portugal and other EU countries



Note: Balance sheet item: loans other than revolving loans and overdrafts, convenience and extended credit card debt. Original maturity/Period of notice/Initial rate fixation: up to one year. MFI interest rate data type: annualised agreed rate (AAR) / Narrowly defined effective rate (NDER).

Source: ECB (2015), "MFI Interest Rates", Statistical DataWarehouse, European Central Bank, September.

Figure 40. Lending to the private sector, January 2008–September 2015



a. Loans of other monetary financial institutions (excluding securities and including credit to emigrants) to households and non-financial corporations. Adjusted for securitisation.

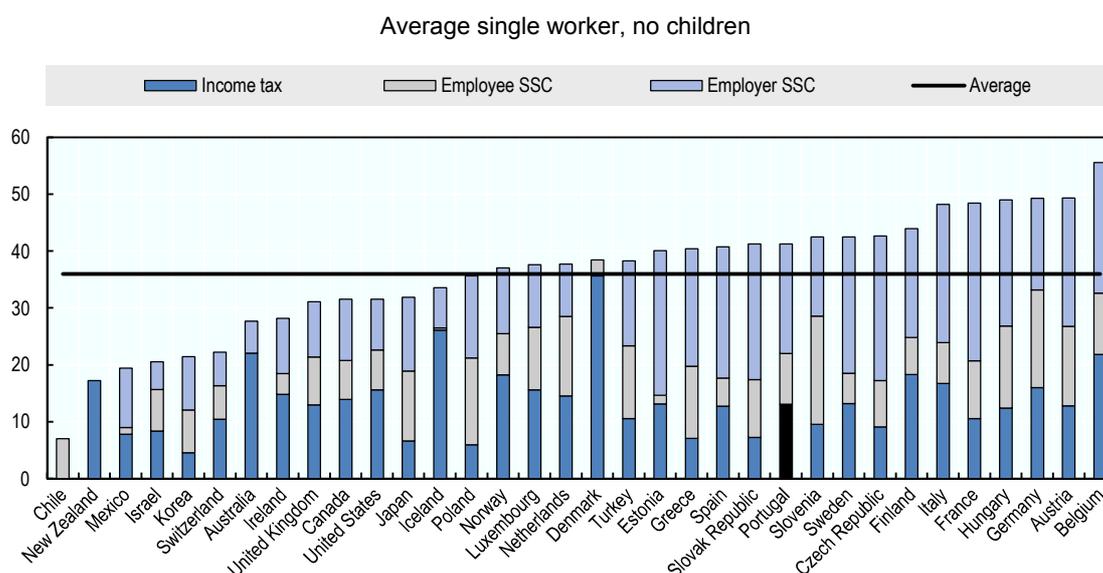
Source: Banco de Portugal (2015), Main Indicators, BP Stat, November.

### Reducing the tax wedge

Portuguese companies are taxed more than in the average OECD country (OECD, 2014c), and this has negative consequences for their competitiveness. Some commentators even go as far as saying that this tax burden is one of the key barriers to better labour market performance in Portugal (Palma Ramalho,

2013; Carvalho Martins, 2014).<sup>83</sup> Of particular relevance for the present report is the tax wedge on labour income, which measures the sum of personal income tax, employee and employer social security contributions (net of family benefits) as a proportion of total labour costs (i.e. gross wages plus employer social security contributions). It is a measure of the difference between how much employers pay to hire a worker, and how much that worker takes home in net pay. The tax wedge therefore has an impact on both labour demand (by affecting the cost of hiring) as well as on labour supply (through its relationship with the reservation wage). As an illustrative example, Figure 41 shows the average tax wedge in OECD countries on a single worker with no children. At 41.2% versus 36.0%, the tax wedge in Portugal is considerably higher than the OECD average, and this difference is due entirely to higher social security contributions paid by Portuguese employers.<sup>84</sup>

Figure 41. Average tax wedge, 2014



Source: OECD (2015), *Taxing Wages 2015*, OECD Publishing, Paris.

Plans to reduce employer social security contributions and compensate for the lost revenue through increases in VAT were, unfortunately, shelved (Portugal, 2015) – but such reductions would still be useful in boosting labour demand. While an across-the-board cut in employer social security contributions may be unrealistic in the current financial climate, more targeted reductions for disadvantaged workers might be more feasible. For example, a number of OECD countries (France most notably, but also Hungary, the Netherlands, Belgium and the United Kingdom) have lower employer social security contributions on minimum-wage earners than on median-wage earners (OECD, 2015c). Similarly, when Portugal increased the minimum wage to EUR 505 in October 2014, it introduced a cut in employers' social security contributions (of 0.75 percentage points) – though only for minimum-wage workers who were already hired prior to June 2014. While this measure was welcome, a wider application of it to all minimum-wage

83. The adverse effect of the tax wedge on employment may be larger in countries where extensions are common (Murtin, de Serres and Hijzen, 2014).

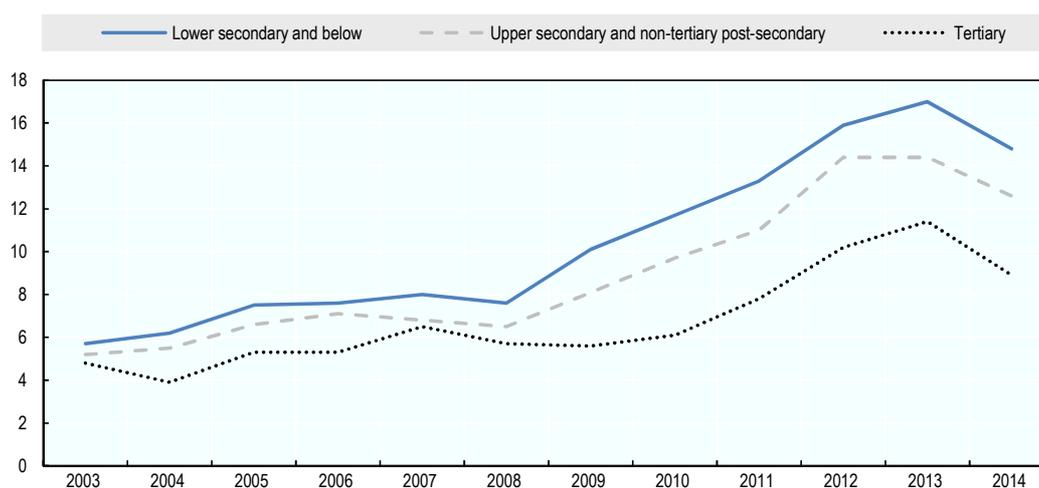
84. In 2013, the government introduced an exceptional income tax surcharge of 3.5% (*sobretaxa extraordinária em sede de Imposto sobre o Rendimento das Pessoas Singulares – IRS*). The new XXI Constitutional Government established on 26 November 2015 has approved a reduction in this surcharge from 3.5% to 1.75% in 2016 and to 0% in 2017. Finally, the new government has plans to introduce a negative income tax (*Complemento Salarial Annual*) for the poorest workers.

workers would have been even more helpful so as to encourage new hiring. With large increases planned in the minimum wage (to EUR 600 by 2019), such cuts in employer social security contributions gain even more relevance. The fiscal cost of such a measure would be mitigated by the reductions in benefit expenditure resulting from higher levels of employment.<sup>85</sup>

### *Investing in skills*

One key challenge that Portugal continues to face in achieving higher levels of productivity (but also inclusiveness) lies in the poor (and unequally distributed) skills of its workforce. Individuals with higher skills have better labour market outcomes. In Portugal, for example, the unemployment rate of 25-64 year-olds with less than tertiary education more than doubled between the start and the peak of the crisis. While those with tertiary education also saw a significant increase in their unemployment rate, the increase was significantly less marked than for those with lower levels of education (Figure 42). In 2014, an individual with less than upper-secondary education was 1.7 times more likely to be unemployed than an individual with tertiary education. There are also important returns to higher education in Portugal, reflecting the fact that demand outstrips supply. The internal rate of return to a tertiary education is 18.7% for men and 20.5% for women (compared to 14.0% and 11.5% across the OECD on average; OECD, 2015d).

Figure 42. **Unemployment rates of the population aged 25-64 by educational attainment, 2003-2014, Portugal**



Note: Because of a methodological change in the Portuguese Labour Force Survey, data prior to 2011 are not fully comparable with the more recent data. The new methodology results in higher levels of unemployment and inactivity compared to the methodology used prior to 2011. For detailed information, see Statistics Portugal (2011).

Source: Eurostat.

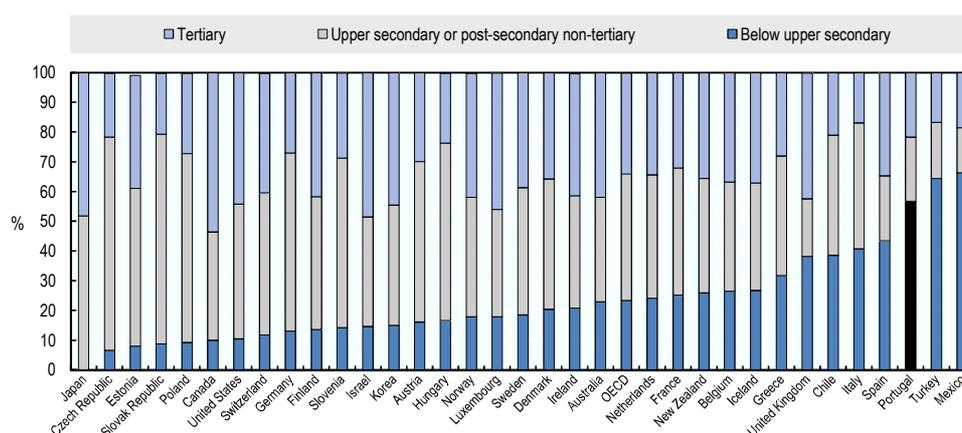
In recent years, Portugal has made significant improvements in the educational attainment of its adult population (OECD, 2015d). Despite this, Portugal lags behind all other OECD countries (except Turkey and Mexico) in terms of the proportion of 25-64 year-olds who have attained at least upper secondary education (Figure 43). Such low levels of attainment can be explained by the low level of attainment among older adults (55-64 year-olds), where eight out of ten have not attained upper secondary education.

85. The XXI Constitutional Government has proposed a reduction in VAT on restaurants as part of the 2016 budget. While such measure might promote employment, it is much less targeted: i) on employment and ii) on low-paid workers than reductions in social security contributions would be. There are many low-paid workers in other sectors, and similarly there are many high-paid workers in the restaurant sector.

Similarly, although Portugal was one of the OECD countries that made the greatest progress between 2003 and 2012 on the PISA tests of mathematics performance of 15-year-olds, its average score remains below the OECD average (Figure 44). Against this background, it is worth mentioning the fact that Portugal has engaged with the OECD in a comprehensive diagnosis of its key skills challenges (OECD, 2015e). The outcome of the exercise provides a solid basis for identifying possible actions to enhance skills development, skills activation and skills use. It provides examples illustrating how other countries have tackled similar challenges, which can be used as input for framing potential policy options for Portugal.

Figure 43. **Educational attainment of 25-64 year-olds, 2014**

Percentage of adults with a given level of education as the highest level attained

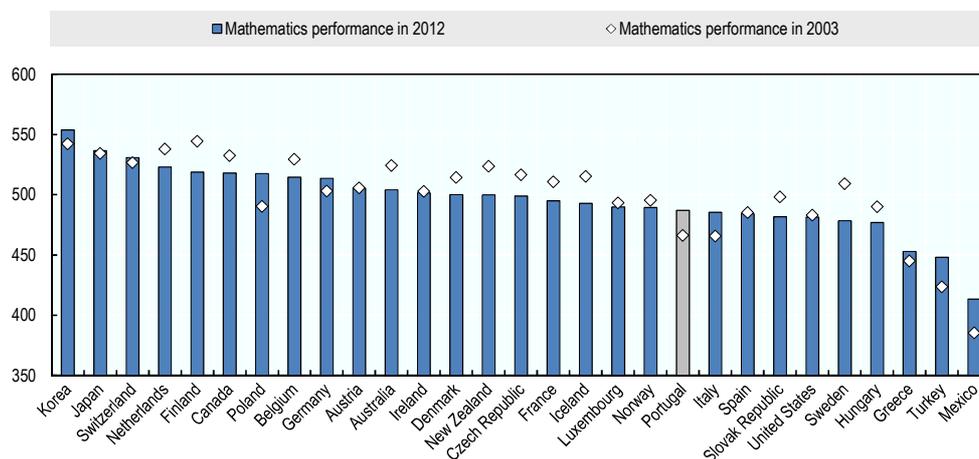


Note: 2013 for Chile and France.

Source: OECD (2015d), *Education at a Glance 2015*, OECD Publishing, Paris.

Figure 44. **Average mathematics performance of 15-year-olds, 2003-2012**

Points



Source: OECD (2014d).

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## ANNEX A

**DETAILED OVERVIEW OF LABOUR MARKET REFORMS IN PORTUGAL  
OVER THE PERIOD 2011-2015**

**Employment Protection Legislation***Severance pay reforms**Open-ended contracts*

Prior to the reforms, the severance pay of workers on open-ended contracts was calculated as one month (30 days) of base wage and tenure-based increments for every full year of tenure – with a minimum of three months.<sup>86</sup>

Over the period 2011-2013, several amendments were made to the severance pay system for open-ended contracts:

- From 1 November 2011 onwards,<sup>87</sup> severance pay on all new open-ended contracts was reduced from 30 to 20 days for each year of tenure, and the minimum requirement of three months was removed. In addition, limits were introduced to the maximum amount of severance pay that could be paid out. Specifically: the base wage (including tenure-based increments) for calculating the entitlement was capped at 20 times the national monthly minimum wage; and the total amount of severance pay could not exceed 12 times the worker's base wage (including tenure-based increments) – i.e. 240 times the national monthly minimum wage.
- From 31 October 2012,<sup>88</sup> some of these new rules were also applied to contracts signed prior to 1 November 2011 – although rights accrued so far were preserved. So, for these contracts, the rules now stipulated that compensation accrued at 30 days per year of tenure up until 31 October 2012, and then at 20 days per year of tenure for years after that. The minimum of three months' pay was maintained, and the new upper limits would also be applied. One exception would be for those individuals whose accumulated compensation rights on 31 October already exceeded the upper limits. In those cases, individuals would simply keep the rights already accrued (even if above the limit), but with no further accruals beyond that date.

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86. The formula for calculating the amount of severance pay was originally defined by Decree-Law 372-A/75 of 16 July and workers were entitled to one full month of severance pay for every year (or fraction of a year) of tenure. Decree-Law 64-A/89 of 12 February specified that the basis on which the amount of severance pay was to be calculated was the base wage (excluding overtime pay or bonuses). However, the Labour Code of 2003 subsequently added tenure-based increments to the calculation. The LC 2003 also specified that, in the case of fractions of years of tenure, the amount of severance payment was to be calculated proportionally.

87. Law 53/2011 of 14 October.

88. Law 23/2012 of 25 June.

- From 1 October 2013,<sup>89</sup> a further reduction in severance pay was introduced: from 20 to 12 days per year of tenure, with a temporary regime for contracts for which the duration on 1 October 2013 was inferior to three years. Because rights accrued to date were preserved, three regimes now applied depending on when the employment contract was signed:
  - For contracts signed before 1 November 2011:
    - 30 days per year of tenure until 31 October 2012;
    - 20 days per year of tenure between 1 November 2012 and 30 September 2013;
    - For the period after 1 October 2013:
      - ❖ If the overall contract duration was inferior to three years on 1 October 2013: 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that.
      - ❖ If the overall contract duration was three years or more on 1 October 2013: 12 days per year of tenure.
  - For contracts signed between 1 November 2011 and 30 September 2013:
    - 20 days per year of tenure for the period up to 30 September 2013;
    - For the period after 1 October 2013:
      - ❖ If the overall contract duration was inferior to three years on 1 October 2013: 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that.
      - ❖ If the overall contract duration was three years or more on 1 October 2013: 12 days per year of tenure.
  - For contracts signed after 1 October 2013:
    - 12 days per year of tenure.

#### *Fixed-term contracts*

Prior to the reforms, temporary workers whose contracts were not renewed or converted to permanent ones by their employers were entitled to severance pay equal to: three days of base pay and tenure-based increments per month of work in case of contracts that lasted six months or less; and two days of base pay and tenure-based increments per month of work in case of contracts that lasted more than six months.

From 1 November 2011 onwards,<sup>90</sup> severance pay on all new fixed-term contracts was aligned with that of all new open-ended contracts – i.e. 20 days for each year of tenure, with fractions of a year counted proportionally and upper limits applying.

From 31 October 2012 onwards, the new rules were also extended to contracts signed prior to 1 November 2011 – although rights accrued to date were preserved. Severance pay was therefore equal to two or three days per month of tenure for the period up until the 31<sup>st</sup> of October 2012, and 20 days per year of tenure for years after that (with the new upper limits applicable).

89. Law 69/2013 of 30 August.

90. Law 53/2011 of 14 October.

Finally, from 1 October 2013, severance pay was further reduced to 18 days per year of tenure, up to the ceilings defined above. As in the case of open-ended contracts, rights accrued to date were preserved, so that three separate regimes are now applicable, depending upon when the original contract was signed (and taking account of the two exceptional extensions of temporary contracts which were allowed):

- For contracts signed before 1 November 2011:
  - For the period up to and including 31 October 2012: three days of base pay and tenure-based increments per month of work in case of contracts that lasted six months or less; and two days of base pay and tenure-based increments per month of work in case of contracts that lasted more than six months.
  - For the period between 1 November 2012 and 30 September 2013: 20 days per year of tenure (with fractions of a year counted proportionately).
  - For the period after 1 October 2013:
    - ❖ If the overall contract duration was inferior to three years on 1 October 2013: 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that.
    - ❖ If the overall contract duration was three years or more on 1 October 2013: 12 days per year of tenure.
- For contracts signed between 1 November 2011 and 30 September 2013:
  - For the period up to and including 30 September 2013: 20 days per year of tenure (with fractions of a year counted proportionately).
  - For the period after 1 October 2013:
    - ❖ If the overall contract duration was inferior to three years on 1 October 2013: 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that.
    - ❖ If the overall contract duration was three years or more on 1 October 2013: 12 days per year of tenure.
- For contracts signed between 1 October 2013:
  - 18 days per year of tenure (with fractions of a year counted proportionately).

Table A1 below summarises all the changes to severance pay (for both open-ended and temporary contracts).

Note that, in addition to the reforms outlined above, the 2012 amendment of the Labour Code declared void all provisions contained in collective agreements signed prior to the entry into force of the new Labour Code which established higher amounts of severance pay than those resulting from the Labour Code.

Table A1. Changes over time in severance payment for open-ended and fixed-term contracts

## Rules for calculation of severance pay for open-ended contracts

Contract signed	Before	01-11-2011	31/10/2012	01/10/2013
< 01/11/2011	30 days per year of tenure minimum of 3 months no upper limits	30 days per year of tenure minimum of 3 months no upper limits	<u>until 31/10/2012</u> : 30 days per year of tenure <u>from 1/11/2012</u> : 20 days per year of tenure • minimum of 3 months • upper limits applicable [except contracts exceeding the upper limit on 31/10/2012: entitlement frozen]	<u>until 31/10/2012</u> : 30 days per year of tenure <u>until 30/09/2013</u> : 20 days per year of tenure <u>from 01/10/2013</u> : • If overall contract duration was < 3 years on 01/10/2013: 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that • If overall contract duration was > 3 years on 01/10/2013: 12 days per year of tenure minimum of 3 months upper limits applicable [except contracts exceeding the upper limit on 31/10/2012: entitlement frozen]
01/11/2011 < x ≤ 30/09/2013		20 days per year of tenure no minimum upper limits applicable	20 days per year of tenure no minimum upper limits applicable	<u>until 30/09/2013</u> : 20 days per year of tenure <u>from 01/10/2013</u> : 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that no minimum upper limits applicable
> 01/10/2013				12 days per year of tenure no minimum upper limits applicable

## Rules for calculation of severance pay for fixed-term contracts

Contract signed	Before	01-11-2011	31/10/2012	01/10/2013
< 01/11/2011	contracts < 6 months: 3 days per month; contracts > 6 months: 2 days per month no upper limits	contracts < 6 months: 3 days per month; contracts > 6 months: 2 days per month no upper limits	<u>until 31/10/2012</u> : contracts < 6 months: 3 days per month contracts > 6 months: 2 days per month <u>from 1/11/2012</u> : 20 days per year of tenure upper limits applicable	<u>until 31/10/2012</u> : contracts < 6 months: 3 days per month contracts > 6 months: 2 days per month <u>until 30/09/2013</u> : 20 days per year of tenure <u>from 01/10/2013</u> : • If overall contract duration was < 3 years on 01/10/2013: 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that • If overall contract duration was > 3 years on 01/10/2013: 12 days per year of tenure upper limits applicable
01/11/2011 < x ≤ 30/09/2013		20 days per year of tenure upper limits applicable	20 days per year of tenure upper limits applicable	<u>until 30/09/2013</u> : 20 days per year of tenure <u>from 01/10/2013</u> : 18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that upper limits applicable
> 01/10/2013				18 days per year of tenure for the first three years of the contract and 12 days per year of tenure for every year after that upper limits applicable

### ***Introduction of a dismissal fund***

Two dismissal funds were set up in October 2013<sup>91</sup> which collect compulsory monthly contributions from employers into individual savings accounts of workers, and which are intended to cover part of the severance payment in case of dismissal.

To be precise, the new law introduced a severance pay fund (*Fundo de Compensação do Trabalho – FCT*), the “equivalent mechanism” (ME) and the severance pay guarantee fund (*Fundo de Garantia de Compensação do Trabalho – FGCT*). Monthly contributions to these funds are compulsory for each worker hired on or after 1 October 2013 and are set at 0.925% of the worker’s wage for the FCT and 0.075% in case of the FGCT. In practice, these contributions are waived for the first two years of the existence of the fund (or until the employment contract is terminated, whichever comes first) through the temporary Employment Incentive measure (*Incentivo Emprego*).<sup>92</sup> Since September 2015, contributions to the fund stop once the accumulated amount has reached 50% of the severance pay due to the employee in case of dismissal.<sup>93</sup>

The FCT acts as a savings account for the employer and is intended to cover up to half of the severance payment. In this way, it reduces the up-front cost of high severance payments. The fund is managed by the Institute for Social Security Funds Management (*Instituto de Gestão de Fundos de Capitalização da Segurança Social*), but employers may also opt to go with a private fund instead (through the equivalent mechanism) if they think they can obtain better returns that way. When an employee is dismissed, the employer applies to the fund to pay the part of the severance pay that has been saved up, with the employer paying the remaining part.

The FGCT is intended as an insurance fund to which the employee can apply in case the employer’s payment plus the accumulated amount in the FCT fail to add up to 50% of the severance pay entitlement. The FCGT essentially makes sure that, in case of dismissal, the employee receives at least 50% of his/her severance pay entitlement.

If the employee leaves the employer of his/her own accord, the employer can obtain a refund of that worker’s dismissal fund.

### ***Changes to the definitions of fair dismissal***

Changes were introduced to the definitions of fair dismissal linked to: i) the extinction of a work position; and ii) inadaptability. The new regulations have been in force since 1 August 2012.<sup>94</sup>

#### *Dismissal for extinction of a work position*

Prior to the reforms, the law laid down a number of conditions that needed to be fulfilled in case an employer wanted to dismiss a worker for extinction of a work position. The first of these required the employer to prove that s/he could not offer the worker another position, compatible with his/her professional profile. Second, in the event that several comparable positions existed within the workplace, the employer needed to follow strict, seniority-based rules to select the worker to be dismissed (“last in,

91. Law 70/2013 of 30 August.

92. Ordinance 286-A/2013 of 16 September. Ordinance 17/2014 of 27 January brings some improvements in the administrative process of the *Incentivo Emprego*.

93. Decree-Law 210/2015 of 25 September.

94. Law 23/2012 of 25 June.

first out”), namely the worker with: i) the least seniority in the position; ii) the least seniority in the professional category; iii) the lowest level within the professional category; iv) the least seniority within the firm.<sup>95</sup>

Regarding the criteria for deciding which worker to dismiss, these were removed as of 1 August 2012 and replaced by “relevant and non-discriminatory” criteria to be defined by the employer him/herself and which should be directly related to the reason for extinction of the work position. However, in September 2013, this change was judged to be unconstitutional by Portugal’s Constitutional Court<sup>96</sup> and, in response to this, another revision of the criteria took force on 1 June 2014.<sup>97</sup> The new dismissal criteria require employers to select the worker: i) with the worst performance evaluation (measured against benchmarks previously known to the employee); ii) with the lowest academic and professional qualifications; iii) who presents the greatest cost burden to the employer; iv) with the least experience in the position; v) with the least seniority within the firm.

The second change introduced as of 1 August 2012 was the elimination of the requirement that the employer should try and find another suitable position for the worker s/he intends to dismiss (sometimes referred to as *repêchage*). While the removal of this condition was unlikely to make much difference in practice,<sup>98</sup> the Constitutional Court also ruled this change unconstitutional,<sup>99</sup> and it was subsequently reinstated (as of 1 June 2014).<sup>100</sup>

#### *Dismissal for inadaptability*

According to the Labour Code of 2009 a worker could be dismissed for inadaptability in situations where s/he: i) displayed a continuous fall in productivity or quality; ii) caused repeated damage to equipment or machinery; iii) presented a risk to the health and safety of him/herself, other employees, or third parties.

In order to dismiss a worker for inadaptability, a number of conditions needed to be met by the employer: i) six months prior to the start of the dismissal procedure, changes needed to have been introduced to the nature of the job as a result of technological change or the adoption of new production/sales practices; ii) the worker needed to have been offered appropriate training in a certified institution to allow him/her to adapt to the changes in the post; iii) after the training, the worker needed to have been granted a period of adaptation on the job of at least 30 days; iv) there was no other suitable position within the organisation that could be offered to the worker; and v) the situation of inadaptability did not derive from a lack of health and safety conditions for which the employer was at fault. If these

95. One exception to this rule applied to firms with fewer than 50 registered employees in the previous calendar year, in which case the employer could resort to the rules governing collective dismissal (which do not contain seniority-based requirements for choosing the worker to be dismissed) if at least two workers were to be dismissed (Pestana Nascimento, 2012).

96. Decision n° 602/2013 of the Constitutional Court on 20 September 2013. The new criteria were judged to be too subjective.

97. Law 27/2014 of 8 May.

98. It would hardly be accepted that an employer eliminated a work position while, at the same time, recruiting workers for an equivalent position/professional category (Pestana Nascimento, 2012).

99. Decision n° 602/2013 of the Constitutional Court on 20 September 2013.

100. Law 27/2014 of 8 May.

conditions were all fulfilled, the employer also needed to comply with certain notification and consultation procedures prior to proceeding with the dismissal.<sup>101</sup>

On 1 August 2012, two changes were introduced to this procedure.<sup>102</sup> First, as in the case of dismissal for extinction of a work position, the *repêchage* condition was removed – although this has subsequently been re-introduced after the Constitutional Court judged this change to be unconstitutional.<sup>103</sup> There is one important exception to this, however. Indeed, the second change introduced on 1 August 2012 implied that, henceforth, dismissal on the grounds of inadaptability could also apply in cases where no changes to the nature of the job had been introduced. In addition, there is no requirement under this modality that the employer offers the worker an alternative and suitable position within the workplace (Monteiro Fernandes, 2014).

### ***Exceptional extension of temporary contracts***

In Portugal, fixed-term contracts can only be used to meet a temporary need of the company and for the period strictly necessary to meet this need. In addition, fixed-term contracts may be used: i) for the launch of a new activity of undefined duration or the start-up of a company (or establishment) with fewer than 750 workers; and ii) in the case of first-time jobseekers, the long-term unemployed, or other situations specified in special employment policy legislation. Fixed-term contracts can be renewed up to three times and their total duration (including all renewals) cannot normally exceed three years (in the case of temporary contracts of pre-defined duration). Some exceptions to this rule are made for: i) first-time jobseekers (18 months overall duration); ii) the long-term unemployed and contracts signed in the context of the launch of a new activity and or a new start-up (24 months overall duration). Temporary contracts of uncertain duration may last up to six years.

During the period of the reforms, two exceptional extensions of temporary contracts (of pre-defined duration) were allowed. The first exceptional extension came into force on 11 January 2012<sup>104</sup> and allowed two additional extensions (not exceeding 18 months overall) of all fixed-term contracts that were set to reach the maximum limit of duration by the end of June 2013. In addition, the duration of each exceptional renewal could not be less than one sixth of the maximum duration of the fixed-term contract or its effective duration, whichever is lower. The validity of contracts renewed under this law expired on 31 December 2014. The second exceptional renewal came into force on 8 November 2013<sup>105</sup> and allowed all fixed-term contracts that would reach the maximum limit of duration by 7 November 2015 to be extended twice (but not exceeding 12 months overall). Once again, the duration of each exceptional renewal could not be less than one sixth of the maximum duration of the fixed-term contract or its effective duration, whichever is lower. The validity of contracts renewed under this law expires on 31 December 2016.

### ***Employment contracts of very short duration***

The Portuguese Labour Code specifies a special form of temporary contract of very short duration (*muito curta duração* – introduced in 2009) which can be used for the purposes of seasonal agricultural

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101. In addition, inadaptability can arise in situations where workers assigned to technically complex posts or in positions of management did not meet the objectives previously agreed with them in writing. In this case, the employer only needs to fulfil conditions i) and v) in order to proceed with the dismissal.

102. Law 23/2012 of 25 June.

103. Decision n° 602/2013 of the Constitutional Court on 20 September 2013; and Law 27/2014 of 8 May.

104. Law 3/2012 of 10 January.

105. Law 76/2013 of 7 November.

activities or the organisation of touristic events. This contract is not subject to written form, although its celebration should be communicated electronically to social security. Prior to the reforms, these contracts could last no longer than a week, with a limit of 60 days over a period of 12 months. The length of these contracts was increased to 15 days, and the overall annual limit to 70 days.<sup>106</sup>

### ***Measures to tackle dependent self-employment***

The reforms also attempted to tackle labour market segmentation by reducing the level of “dependent self-employment”. The Labour Code of 2009 already defined the conditions under which an employment contract would be presumed (i.e. under which the worker would be considered a wage earner), but the new law<sup>107</sup> provides labour inspectors with the necessary tools to enforce the existing regulations. In particular, a procedure was introduced which should be followed in case a labour inspector detects misuse of service provider contracts. In a first instance, the employer is given ten days to regularise the situation. If this fails, a process is initiated to establish an employment contract. The new law came into force on 1 September 2013.

### **Collective bargaining**

The recent labour market reforms introduced a number of changes to collective bargaining in Portugal.

#### ***New criteria for the extension of collective agreements***

Prior to the reform, the most common form of collective agreement in Portugal was the sectoral agreement (*Contrato Coletivo de Trabalho*, CCT), which is an agreement negotiated between one or more employer organisations and one or more trade unions. The two other forms of collective agreement in Portugal are: i) agreements between groups of firms (*Acordos Coletivos de Trabalho* – ACT), which are signed by several employers that are not part of an employer organisation and one or more trade unions; and ii) firm-level agreements (*Acordos de Empresa*) involving just a single employer. ACTs are common in the financial and utilities sectors, while firm-level agreements (which are less common) occur most often in the oil, transport and communication sectors (Addison, Portugal and Vilares, 2015).

In Portugal, collective agreements are only binding for trade union members. In practice, however, employers who sign an agreement generally extend its application to their entire workforce, irrespective of the union status of their workers.<sup>108</sup> This is partly because there is no legal mechanism in Portugal that obliges trade unions and employer organisations to disclose their membership. In addition, the Ministry of Employment, Solidarity and Social Security has traditionally extended collective (sectoral) agreements to the whole sector (using *portarias de extensão* or extension ordinances), upon request of at least one of the parties to the agreement.

The extension of collective agreements was frozen from May 2011 onwards, and this suspension remained in force until 2012, when changes were introduced to the criteria for awarding extensions.<sup>109</sup> The idea behind the reform was to extend agreements only if they were representative of the sector,

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106. Law 23/2012 of 25 June.

107. Law 63/2013 of 27 August.

108. Employers extending collective agreements to non-union employees is common practice in most countries, if only to prevent tensions within the workforce. In some countries application to non-union members is required by law (as in the Netherlands).

109. Cabinet Resolution 90/2012 of 31 October 2012.

geographical area or occupation they are meant to cover. So, besides a new requirement that at least one union and one employer organisation now needed to request the extension, the latter will only be granted if the employers that signed it employed at least 50% of the workers in the sector, geographical area or occupation to which the agreement is to be extended. In June 2014, this requirement was softened by addition of a new, alternative requirement which stated that extension agreements will also be considered if the signatories to the agreement consist of at least 30% of micro-, small- and medium-sized enterprises (employing up to 250 employees each).<sup>110</sup>

### ***Firm-level bargaining***

Since 1 August 2012, works councils have been able to negotiate at plant level in firms with at least 150 employees (previously this was limited to firms with at least 500 employees). However, because the Portuguese Constitution gives trade unions exclusive rights to represent workers in the negotiation process (Article 56 of the Constitution), this can only happen if the latter delegate the power to negotiate to workers' associations. The attempt to encourage greater decentralisation of collective bargaining was accompanied by the creation of an Industrial Relations Centre (*Centro de Relações Laborais*), whose purpose it is to provide information and technical assistance to the parties involved in collective bargaining.<sup>111</sup>

From September 2014 onwards,<sup>112</sup> the government also introduced the possibility of collective agreements to be temporarily suspended in cases where the firm finds itself in a situation of crisis, due to market conditions, structural or technological reasons, or other events that have seriously impacted on the normal, day-to-day activity of the firm – as long as this suspension is indispensable for the survival of the firm and to avoid employment losses. Prior agreement needs to be reached with trade unions, and such agreement needs to state very clearly the reason for the suspension and its duration.

Finally, while articulation has, in theory, already been possible since the 2003 Labour Code,<sup>113</sup> this rarely occurred in practice (MTSS, 2006; Távora and González, 2015). The recent reforms further encouraged the inclusion of articulation clauses between different levels of bargaining, particularly on matters of functional and geographical mobility, the organisation of working time, and compensation.<sup>114</sup>

### ***Expiry of collective agreements***

The reforms also targeted cessation clauses contained within certain collective agreements which stipulate that the agreement remains in force until it is replaced by a new agreement (which, in practice, means it could remain in force indefinitely). The Labour Code of 2009 already prohibited such clauses in new agreements, and put a limit on the validity of cessation clauses in existing agreements i.e. they would expire five years after either: i) the last publication of the full agreement; ii) one of the parties withdraws from the agreement; or iii) one of the parties proposes a revision of the agreement. From 1 September 2014 onwards, the expiry period of these clauses was further reduced from five to three

110. Cabinet Resolution 43/2014 of 27 June 2014.

111. Decree-Law 189/2012 of 22 August.

112. Law 55/2014 of 25 August.

113. Article 563 of Law 99/2003 of 27 August.

114. Article 482 of Law 23/2012 of 25 June.

years.<sup>115,116</sup> It is important to note that the expiry of such clauses does not necessarily imply the expiry of the collective agreement itself.

The reforms also altered the grace period (*sobrevigência*) which kicks in when one of the parties withdraws from a collective agreement. Prior to the reforms, this period could last for as long as the negotiations lasted, or for a minimum of 18 months when no negotiations were taking place. From 1 September 2014 onwards, this grace period was reduced to a minimum of 12 months and a maximum of 18 months.<sup>117</sup>

Finally, if the negotiations ended without new agreement, the old collective agreement would remain valid for another 60 days following the date on which one of the parties informed the relevant ministry (and the other party) of the failure to reach a new agreement (*ultra sobrevigência*). This period was also reduced from 1 September 2014 onwards from 60 to 45 days.<sup>118</sup>

Law 55/2014 of 25 August also envisaged a further reduction of the validity period of cessation clauses to two years and of the grace period to six months, upon positive evaluation by the social partners sitting on the Standing Committee for Social Dialogue (*Comissão Permanente de Concertação Social*) (where positive evaluation involves the consent of at least 50% of the employer organisations and 50% of the trade unions).

## Working-time arrangements

### *Working time accounts*

Portugal introduced a system of working-time accounts with the 2009 Labour Code (*Banco de Horas*) which allowed working time to be extended by four hours per day, but not exceeding a total of 60 hours per week and with a limit of 200 hours per year. Prior to the reform, however, working time accounts could only be set through collective agreements and applied exclusively to the workers covered by those agreements. The new regulations allow the employer to extend the working time accounts agreed as part of a collective agreement to all employees within a certain team, section or unit, as long as 60% of the employees concerned are covered by the collective agreement, or 75% of them agree to it.<sup>119</sup>

The reform also introduced individual working time accounts, which could be set by agreement between an employer and an employee, and which can be obtained by the latter's non-refusal (after two weeks) of a written proposal from the employer. This mechanism allows normal working time to be extended by two hours per day, up to a total of 50 hours per week, and the total increase in working hours cannot exceed 150 hours per year.<sup>120</sup>

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115. In the absence of such clauses, collective agreements remain in force either: i) for the time period specified in the agreement; or ii) if no such time is specified, for one year (and renewable for one more year). Whether such clauses exist or not, collective agreements can also be terminated upon agreement between the signatory parties.

116. Law 55/2014 of 25 August.

117. Law 55/2014 of 25 August.

118. Law 55/2014 of 25 August.

119. Law 23/2012 of 25 June.

120. Law 23/2012 of 25 June.

The working time accumulated through these accounts can be compensated either: by an equivalent reduction in working hours; by an increase in holiday entitlement; or financially (or some mixture of the three).<sup>121</sup>

### ***Short-time work compensation***

A number of changes were also introduced to simplify the procedures required for employers wishing to implement short-time work schemes, such as temporary reductions in working time or temporary lay-offs (*redução temporária do período normal de trabalho ou suspensão do contrato de trabalho*).<sup>122</sup> The notice period for employers to inform workers of the measure to be applied was reduced from ten to five days, with a possibility to implement immediately if the works council (or the majority of workers concerned) agrees. In addition, the workers' representative body can no longer oppose an extension of the short-time work scheme, as long as the employer follows the necessary communication procedures. The reform also put in place some additional measures to protect workers (e.g. to avoid the dismissal of workers immediately following the end of the scheme) and gives them an increase in pay in case they attend a training course during the short-time work period (0.3 x IAS, divided equally between the employer and employee).

### ***Reductions in holiday entitlements***

Four public holidays were abolished by the reforms (from 1 January 2013 onwards), reducing the total number of bank holidays per year from 15 to 11.<sup>123,124</sup> In addition, workers who had not been absent during the previous year, or only had a small number (<3) of justified absences, were previously entitled to 1-3 extra days of annual leave. This entitlement was also revoked by the revision of the Labour Code (again, from 1 January 2013 onwards). The reward for lack of unjustified absences was instead replaced by a punishment for unjustified absence: an unjustified absence on either a Monday, Friday, or immediately preceding or following a public holiday, will now entail the loss of two days of wages. Furthermore, employers can now unilaterally decide to close for business for five consecutive days during Christmas, or for one day between the weekend and a bank holiday which falls on either a Tuesday or Thursday, and take this out of a worker's annual leave entitlement.

## **Wages**

In addition to freezing extensions of collective agreements: i) public sector wages were frozen/cut; ii) the national minimum wage was frozen; and iii) overtime pay and other compensation was reduced.

### ***Public sector wages***

In 2011, the wages of civil servants earning more than EUR 1 500 were cut (by between 3.5% and 10%). The government intended to further cut public sector wages by: i) suspending the 13<sup>th</sup> and 14<sup>th</sup> monthly salary payments for those workers with monthly salaries of EUR 1 100 or more; ii) suspending the equivalent of one of those payments for workers with monthly salaries between EUR 600 and EUR 1 100. However, Portugal's Constitutional Court ruled that these cuts were unconstitutional and

121. Law 23/2012 of 25 June.

122. Law 23/2012 of 25 June.

123. Law 23/2012 of 25 June. The law further specified that this measure will be re-evaluated after a period of five years. The new XXI Constitutional Government has approved plans to re-introduced all four bank holidays from 2016 onwards.

124. Law 23/2012 of 25 June also tried to enforce an equivalent reduction (of up to three days) in the additional holiday entitlements contained in collective agreements and employment contracts signed after 1 December 2003 and prior to 1 August 2012 – but the Constitutional Court rules this to be unconstitutional (Decision no. 602/2013).

that payment of bonuses should be resumed in 2013. These cuts were nevertheless implemented in 2012. In addition, in 2013, the government increased the working hours of public sector workers from 35 to 40 hours per week, without any increase in pay.

Further adjustments to public sector wages were introduced in the 2014 budget. Article 33 of the budget law cuts the total gross pay of public sector employees earning between EUR 675 and EUR 2 000 per month by 2.5% to 12% (progressively), and by 12% for all public sector wages above EUR 2 000. These wage cuts, together with other articles of the Budget Law concerning pensions and unemployment benefits, were ruled unconstitutional by the Portuguese Constitutional Court on 31 May 2014. As this ruling did not apply retroactively, the wage cuts were nonetheless implemented in the first and second quarters of 2014. Other provisions in the Budget Law with an impact on public sector wages, such as a reduction in overtime pay, an uncompensated increase in the weekly hours worked, and a ban on pay increases for promotions or bonuses for public sector managers, were not challenged by the Constitutional Court.

Given that this constitutional ruling had major implications for Portuguese public finances, a new package of austerity measures was introduced in July 2014, which imposed public sector wage cuts of between 3.5% and 10% on wages above EUR 1 500 per month. These cuts would be reversed over a period of four years, with a 20% reduction in the cut programmed in 1 January 2015 and further reductions in the next two years based on budget availability. The austerity measures also specified that the wage cuts had to be entirely reversed within four years. While the Constitutional Court approved the 2014 and 2015 wage cuts in August 2015, it ruled the proposed 2016 wage cuts unconstitutional.

### ***The minimum wage***

The value of the minimum wage was frozen in 2011 and in 2012 and 2013 stood at the level of 2011 (EUR 485). The minimum wage was increased to EUR 505 on 1 October 2014 (and until 31 December 2015). To help employers with existing minimum-wage workers absorb this increase, the government simultaneously announced a temporary decrease of 0.75 percentage points in employer social security contributions on minimum-wage workers who were hired no later than May 2014. This measure would be in place until January 2016.<sup>125</sup>

### ***Compensation for overtime work***

The reform reduced additional compensation for overtime work by half:<sup>126</sup> from 50% to 25% for the first hour of work; and from 75% to 37.5% for every subsequent hour carried out during a normal working day. For overtime work carried out on a weekly rest day or public holiday, additional compensation was reduced from 100% to 50%. In addition, the reform revoked the right of workers who performed overtime work to paid compensatory time off equal to 25% of the number of overtime hours carried out.<sup>127</sup>

Additional compensation for normal work carried out on a bank holiday in a firm not forced to shut on that day was halved from 100% to 50% (and the compensatory time off from work, should the employer opt for this *in lieu* of additional compensation, was reduced from a number of hours equal to the number of overtime hours supplied to half those hours).

In addition, the government suspended for a period of two years all clauses regarding overtime pay and compensatory time off contained in collective agreements and employment contracts signed prior to

125. Decree-Law 154/2014 of 20 October.

126. Law 23/2012 of 25 June.

127. The revision of the Labour Code kept the right to paid compensatory time off (equivalent to the number of hours of overtime carried out) if the overtime: i) impeded the worker from taking 11 hours of daily rest between two working days; or ii) was carried out on a compulsory weekly rest day.

the date on which the new rules entered into force (i.e. 1 August 2012).<sup>128</sup> This suspension was later extended until 31 December 2014.<sup>129</sup>

### Unemployment benefits

On 1 April 2012, a number of changes were introduced to unemployment benefits which aimed to: i) increase access to those benefits; while ii) reducing their generosity (both in terms of their replacement rate and duration).<sup>130</sup>

- Access to unemployment insurance (*subsídio de desemprego*) was increased by easing the employment conditions that a worker needed to satisfy in order to receive the benefit from 450 to 360 days of employment over the past 24 months preceding the unemployment spell. The employment condition for receipt of unemployment assistance (*subsídio social de desemprego*) was maintained at 180 days over the past 12 months.
- The maximum amount of unemployment insurance was reduced from 3 to 2.5 times the social support index (*indexante dos apoios sociais – IAS*)<sup>131</sup> (while it can never, as before, exceed 75% of the average salary over the 12 months period ending 2 months before unemployment).
- A declining replacement rate rule was introduced: after six months (180 days), unemployment insurance would now be reduced by 10% to encourage recipients to actively look for work.
- There was a temporary increase of 10% in the unemployment insurance of households with children where both parents are in receipt of unemployment benefit (equally applicable to single-parent families) – valid between 1 April 2012 and 31 December 2012.<sup>132</sup>
- Maximum benefit duration of unemployment insurance and assistance was cut from 900 to 540 days – although additional increments based on contributory history were maintained, which means that benefit duration for those with a long contribution history (and especially those aged over 50) could exceed this maximum (see Table A2). This new rule was not applicable, however, to the first unemployment spell after the date on which the law entered into force (in which case the old rules would continue to apply). The minimum duration of

128. Law 23/2012 of 25 June also declared void all clauses of collective agreements and employment contracts signed prior to 1 August 2012 and which concern compensatory time off for overtime work carried out on a working day, a complementary weekly rest day, or on a bank holiday. However, the Constitutional Court ruled this change to be against the Constitution (Decision no. 602/2013). Similarly, Law 23/2012 stated that from 1 August 2014 onwards (i.e. two years after the new law entered into force), all additional compensation for overtime work specified in collective agreements and employment contracts would be reduced by half (though not below the rates set by Law 23/2012). Again, however, the Constitutional Court ruled that this change was unconstitutional (Decision no. 602/2013).

129. Law 48-A/2014 of 31 July.

130. Decree-Law 64/2012 of 15 March.

131. Until 2006, welfare benefits in Portugal were determined in relation to the minimum wage. This link meant that increases in the minimum wage had a significant impact on public finances. This is why, in 2007, Portugal introduced the social support index (IAS) to serve as the reference for the determination of welfare benefits. The IAS was initially set at the value of the minimum wage, however it has been frozen at EUR 419.22 since 2009 (with no adjustments for inflation), meaning that it has significantly lost in purchasing power.

132. All unemployment assistance which ran out between 1 January and 31 December 2009 was extended by another six months as a temporary, crisis-related measure (Decree-Law 68/2009 of 20 March).

unemployment spells before and after the reform (without additional increments based on contributory history) are shown graphically in Figure A1.

- The duration of unemployment assistance for those who had already received unemployment insurance was increased for those aged 40 or over. Whereas previously, they would have received unemployment assistance for half the time they had received unemployment insurance for, they would now receive unemployment assistance for the same amount of time (although this was only applicable from the second spell of unemployment after the date on which the new law entered into force).
- In order to incentivise a return to work, the government also introduced a new measure which allows individuals who had: i) been unemployed for at least six months<sup>133</sup> and ii) had at least six months of entitlement to unemployment benefit left,<sup>134</sup> to keep part of their unemployment benefit if they accept a full-time job with earnings lower than the value of their unemployment benefit.<sup>135</sup> The amount that an individual is entitled to keep is calculated in accordance with the following rules: 50% of the individual's unemployment benefit during the first six months of employment (capped at EUR 500 per month); and then 25% of the individual's unemployment benefit for the following six months (capped at EUR 250 per month). The duration of the subsidy cannot exceed the remaining length of time for which the individual is entitled to unemployment benefit, and is capped at 12 months. The measure could initially not be combined with any of the wage subsidies available, although this was later changed.<sup>136,137</sup>

In addition to the above, the government introduced a contributory system of unemployment protection for the self-employed who work mainly with only one contracting entity<sup>138</sup> – i.e. those self-employed receiving at least 80% of their annual income from a single employer. To access the benefit, the individual needs to have exercised his/her self-employment activity (with the necessary contributions) for a minimum of 720 days (24 months) over the 48 months preceding the date of termination of the service agreement. The daily subsidy amount is calculated using the formula  $[(E \times 0.65)/30 \times P]$ , where E is the self-employed income bracket of the worker at the time the service agreement was terminated, and P represents the proportion of the individual's income that originated from that employer – with upper limits identical to those applied to normal unemployment insurance. The duration of the subsidy depends on the age of the beneficiary and is as described in Table A2. The unemployment protection system for these self-employed workers is financed through a 5% tax paid by employers. The system will be evaluated after two years of operation.

133. This was later reduced to three months, with no minimum for individuals aged 45 or over (Ministerial Ordinance 26/2015 of 10 February).

134. This was later reduced to three months (Ministerial Ordinance 26/2015 of 10 February).

135. Ministerial Ordinance 207/2012 of 6 July.

136. Ministerial Ordinance 26/2015 of 10 February.

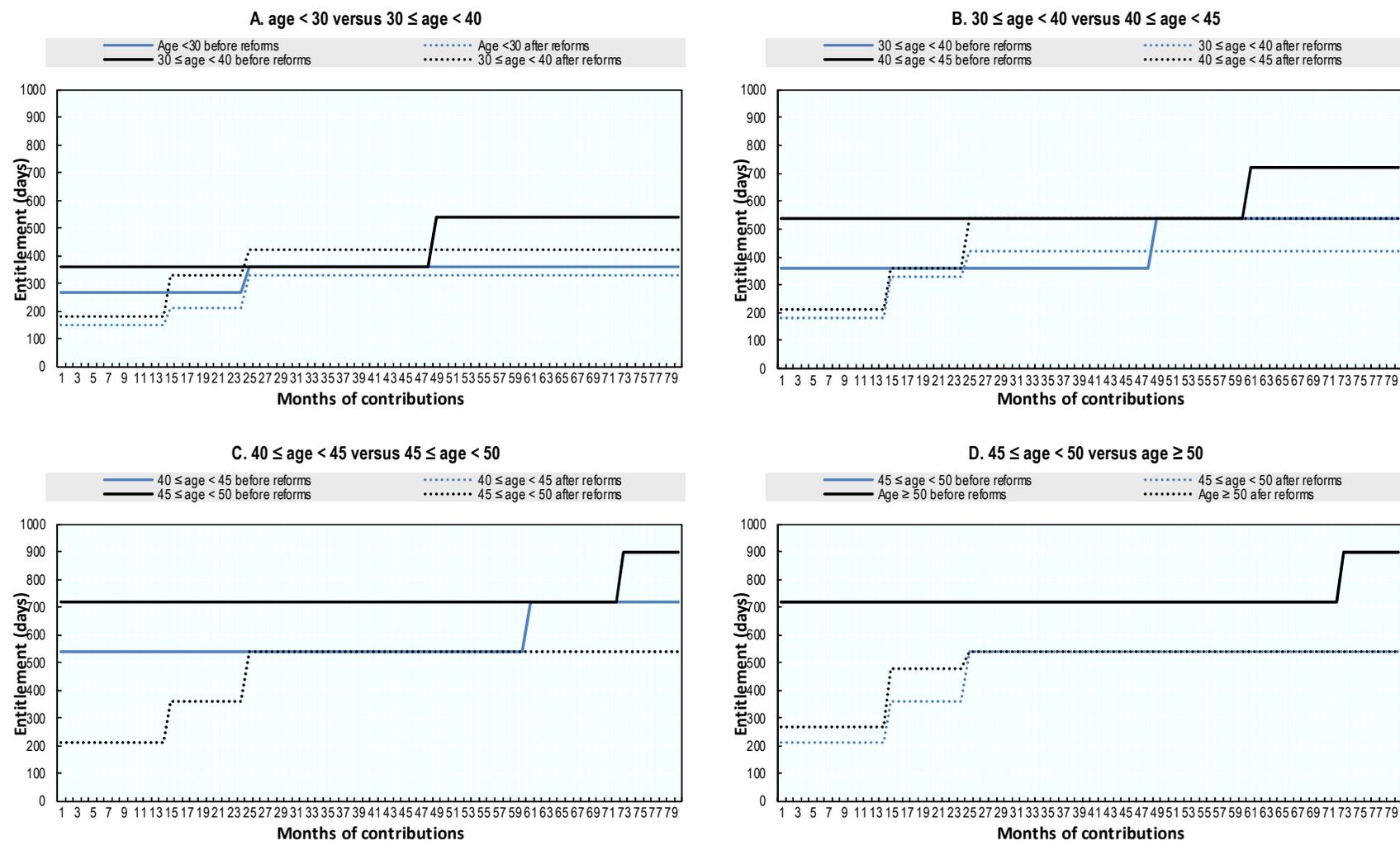
137. Note that it was already possible prior to the reforms to combine part-time work and receipt of unemployment benefits (*subsídio de desemprego parcial*). Unemployment benefit recipients who found part-time work (between 20%-75% of normal full-time working hours) with earnings below their current unemployment benefit were entitled to keep part of their unemployment benefit (calculated as the difference between 1.35 times the unemployment benefit and the part-time earnings) – Decree-Law 220/2006 of 3 November.

138. Decree-Law 65/2012 of 15 March.

Table A2. Changes in unemployment benefit regulations

Old rules				New rules			
Age	Contributions (months)	Entitlement (days)	Increment based on contribution history	Age	Contributions (months)	Entitlement (days)	Increment based on contribution history
Age < 30	≤ 24	270	+ 30 days for every 5 years of contributions	Age < 30	< 15	150	+ 30 days for every 5 years over the past 20 years
	> 24	360		15 ≤ x < 24	210	+ 30 days for every 5 years over the past 20 years	
30 ≤ age < 40	≤ 48	360	+ 30 days for every 5 years of contributions over the past 20 years	Age < 30	≥ 24	330	+ 30 days for every 5 years over the past 20 years
	> 48	540		30 ≤ age < 40	< 15	180	+ 30 days for every 5 years over the past 20 years
				15 ≤ x < 24	330	+ 30 days for every 5 years over the past 20 years	
40 ≤ age < 45	≤ 60	540	+ 30 days for every 5 years of contributions over the past 20 years	30 ≤ age < 40	≥ 24	420	+ 30 days for every 5 years over the past 20 years
	> 60	720		40 ≤ age < 50	< 15	210	+ 45 days for every 5 years over the past 20 years
Age ≥ 45	≤ 72	720	+ 60 days for every 5 years of contributions over the past 20 years	40 ≤ age < 50	15 ≤ x < 24	360	+ 45 days for every 5 years over the past 20 years
	> 72	900		Age ≥ 45	≥ 24	540	+ 45 days for every 5 years over the past 20 years
				Age ≥ 50	< 15	270	+ 60 days for every 5 years over the past 20 years
				15 ≤ x < 24	480	+ 60 days for every 5 years over the past 20 years	
				≥ 24	540	+ 60 days for every 5 years over the past 20 years	

Figure A1. Minimum unemployment duration before and after the reform (without increments based on contributory history)



## Activation

### *Modernisation of the Public Employment Service*

In 2012, the government launched a programme for the modernisation of the Public Employment Service (*Programa de Relançamento do Serviço Público de Emprego*) – see Box A1.<sup>139,140</sup> Many of these measures aimed to strengthen Portugal’s activation strategy – in particular the reporting requirements and referrals to active labour market measures of two groups of jobseekers: i) those aged 45+; and ii) those unemployed for six months or over (*convocatórias*).

#### Box A1. Modernisation of the Public Employment Service: Goals and measures

The PES modernisation programme aimed to: i) strengthen the employability of jobseekers; ii) better capture existing job opportunities; iii) improve co-operation between stakeholders; iv) modernise information systems; v) adopt a more systematic approach to active labour market policies (ALMPs); vi) improve the coherence between active and passive labour market policies; vii) regularly evaluate the performance of local PES offices; and viii) re-organise the PES network. A series of measures were outlined under each of these objective, as follows:

#### **Strengthening the employability of jobseekers:**

- Referral of jobseekers to either job search assistance or short-term training, within two weeks of registration.
- Priority referral of young jobseekers to job offers, internships or training in the context of the *Iniciativa Oportunidades para a Juventude*.
- PES staff to take up the role of “career manager” accompanying a certain number of jobseekers on an individual and continuous basis.
- More detailed and regularly updated individual action plans (*Plano Pessoal de Emprego*) and profiling.
- Measures to strengthen jobseekers’ skills through training programmes.
- Better identification of shortage occupations on the basis of difficult-to-fill vacancies.
- Retraining of jobseekers based on labour market needs.

#### **Better capturing existing job opportunities:**

- Setting up a job-registration mechanism, disseminated via social media, and integrated with an online vacancy database (*Portal NetEmprego*).
- Simplify the procedure for seeking employer authorisation to publish their vacancies on the *Portal NetEmprego* webpage.
- Publicly-available electronic register of all vacancies registered with the PES.

#### **Stakeholder co-operation to place jobseekers:**

- Regular collaboration between Job Centres (*Centros de Emprego*), temporary work agencies, and private employment agencies to improve, among others, information about job vacancies.
- Promote partnerships between Job Centres and employer associations to facilitate the registration and treatment of their members’ job vacancies.
- Stronger partnerships with the PES from other countries.

139. Cabinet Resolution No. 20/2012 of 9 March.

140. The Public Employment Service in Portugal is called the *Instituto de Emprego e Formação Profissional* (IEFP).

- Stronger integration with the EURES network.
- Establish partnerships with private employment agencies for placing jobseekers not in receipt of unemployment insurance or assistance.
- Carry out pilot projects based on best practices from around Europe.

**Modernise information systems:**

- Re-design the website (*Portal NetEmprego*).
- Improve the electronic registration of the unemployed, including the possibility to upload individual action plans.
- Implement a system for arranging interviews through e-mail and/or text messages.
- Breathe new life into the *Serviços de Atendimento Interativos* (SAI) [interactive customer service].
- Better matching between jobseekers and vacancies based on the available information.

**A more systematic approach to ALMPs:**

- Classification of ALMPs into five categories: employment incentives and direct job creation; internships; social work; self-employment and entrepreneurship support; training.
- Consolidate ALMPs and clearly define their objectives and the conditions under which they should be administered.
- Train “career managers” in the use of ALMPs.
- External evaluation of the effectiveness of ALMPs.

**Improve the coherence of active and passive labour market policies:**

- Mandatory meetings with PES case workers for unemployment benefit recipients aged 45+ and referral to ALMPs to strengthen their employability and/or promote their return to work.
- Referral of those receiving unemployment benefit for six months or more to active labour market policies.
- Reduce fraud in active job search activities (i.e. benefit recipients who attend job interviews just to fulfil the requirements for continued benefit receipt) through accompanied interviews.
- Enable jobseekers to keep part of their unemployment benefit while accepting full-time job offers.

**Create permanent evaluation mechanisms of local PES offices:**

- Introduce an efficiency rating system of local PES offices.
- Carry out customer satisfaction surveys (particularly among the unemployed).
- Evaluation of placement efforts and control of job search activity.

**Restructure the current network of Job Centres and Vocational Training Centres (*Centros de Formação Profissional*):**

- Merging of Job Centres, creating larger local offices that cover a greater territory.
- Merge Job Centres and Professional Training Centres to form Employment and Professional Training Centres (*Centros de Emprego e de Formação Profissional*).
- Develop a human resources strategy to strengthen resource allocation in local offices.
- Eliminate duplication in tasks between different local offices.

### *Private employment and temporary work agencies*

The government also made it easier to set up private employment and temporary work agencies:<sup>141</sup> prior authorisation is no longer required and was replaced by simple prior communication. The alteration to the law also eliminated the incompatibility between the activities of temporary work and private employment agencies, and the deposit required to set up an agency was cut by half. While there were also plans to allow the PES to contract out some of its activities to private employment agencies, in practice this still has not materialised.

### **Hiring subsidies**

During the crisis period, a number of hiring subsidies were introduced, which were revised on a number of occasions and, eventually, merged into one programme.<sup>142</sup>

### *Estímulo 2012*

The strengthening of activation measures was accompanied by the introduction of a new hiring subsidy, *Estímulo 2012*,<sup>143</sup> on 14 February 2012, and which was aimed at those who had been (registered) unemployed for at least six consecutive months. The subsidy was payable for a period of six months and was equivalent to 50% of the individual's wage over that period – or as high as 60% in case the person hired: i) was on a permanent contract; ii) was in receipt of income support (*rendimento social de inserção*); iii) was aged 25 or under; iv) had a disability; v) was low-skilled (i.e. had not completed basic education); or vi) was long-term unemployed (12 months or more). However, the overall monthly value could not exceed the IAS. While the subsidy could be combined with social security reductions that the employer was entitled to, it could not be used in combination with other direct employment support for the same position. In return for the subsidy, the employed needed to provide either: i) on-the-job training under the supervision of a specially assigned tutor; or ii) at least 50 hours of training with a certified training provider (during normal working hours). Only employers with at least five employees could apply for the subsidy, except where the employer opted for the second training option. The position offered needed to be full-time and on a contract lasting at least six months. Employers could not cumulate more than 20 subsidies and needed to prove that the subsidy was leading to net employment creation within the firm. In case the employer breached any of the conditions of the subsidy, it would need to be refunded (at least in part).

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141. Law 5/2014 of 12 February.

142. Prior to the introduction of these new hiring subsidies, a programme (*Incentivos à Contratação*) was already in place which offered a temporary exemption from social security contributions for a period of up to three years as well as financial support for employers who hired an individual who was either long-term unemployed (one year or over) or a first-time jobseeker (aged 16-30). 100% of the social security contributions were exempted in case of a permanent contract, reduced to 50% in case of a temporary contract. In case of permanent contracts, employers were also entitled to financial support equal to 12 times the minimum wage applicable for that activity (Decree-Law 89/1995 of 6 May). This programme has been changed a number of times since its introduction. Currently, the programme consists in an exemption from employer social security contributions for the duration of three years (or of the contract, whichever is shorter) for employers who hire, on an open-ended contract, an individual who was either long-term or first-time jobseeker.

143. Ministerial Ordinance No. 45/2012 of 13 February.

### ***Estímulo 2013***

On 14 April 2013, a revised programme (*Estímulo 2013*) replaced *Estímulo 2012*.<sup>144</sup> The coverage of the programme was extended to a larger group of potential beneficiaries. In particular, those who had been unemployed for three consecutive months could now also benefit from the programme if they fulfilled one of the following conditions: i) they were low-skilled (i.e. had not completed basic education); ii) they were aged 45 or over; iii) they were single parents; iv) they lived in a workless household. In addition, those who had not been registered with social security (and were not studying) – i.e. inactive – for the past 12 months were now also eligible. The higher value of the subsidy (i.e. 60% of wages instead of 50%) was now also paid in case the hired worker was aged 50 or over, or in case his/her gender was under-represented in the particular sector of activity of the employer. Additional incentives were put in place to encourage employers to either offer a permanent contract to start with or convert a subsidised temporary contract into a permanent one. In the first case, the subsidy was awarded for a period of 18 months (instead of six) and the maximum monthly value of the subsidy could be 1.3 x IAS. In the second case, a conversion reward equivalent to an additional nine months (capped at nine times the IAS) would be paid. Some additional, smaller changes included: i) an upper limit of 25 subsidies per employer in the case of fixed-term contracts, and no upper limit in the case of open-ended contracts; ii) external training did not necessarily have to be carried out during working hours (although there then needed to be an equivalent reduction in working hours); and iii) the subsidy could now also be paid (proportionately) to part-time workers.

### ***Apoio à Contratação via Reembolso da TSU***

In the context of *Impulso Jovem*, the government launched the *Apoio à Contratação via Reembolso da TSU*<sup>145</sup> – a reduction in social security contributions targeted at long-term unemployed (12 months or more) youth (aged 18-30). These youth could be hired either on a permanent or on a temporary contract of at least 18 months. The subsidy, payable for 18 months, consisted in: a 100% waiver of the Single Social Tax (Taxa Social Única) in case of a young person hired on a permanent contract; and a 75% waiver in case the contract was temporary. Employers could not benefit from more than 20 subsidies. The maximum value of the reimbursement could not exceed EUR 175 per month. This measure could be used in combination with *Estímulo 2012*. The programme was launched on 4 August 2012. As with the *Estímulo* programme, there was a requirement of net job creation by the employer.

The programme was reviewed on 14 February 2013.<sup>146</sup> One of the most important changes was the extension of the coverage of the programme to include: i) young people unemployed for at least six months (instead of the previous 12 months); and ii) young people who had been inactive (but not studying) since leaving school and for at least 12 months. The programme was also extended to part-time contracts.

### ***Apoio à contratação de desempregados com idade igual ou superior a 45 anos via reembolso da TSU***

In February 2013, an *Apoio à Contratação via Reembolso da TSU* was created for unemployed individuals aged 45 or over.<sup>147</sup> The programme was virtually identical to the one for young people, except that the maximum value of the reimbursement was higher (EUR 200 per month instead of EUR 175).

144. Ministerial Ordinance 106/2013 of 14 March.

145. Ministerial Ordinance 229/2012 of 3 August.

146. Ministerial Ordinance 65-A/2013 of 13 February.

147. Ministerial Ordinance 3-A/2013 of 4 January, and revised by Ministerial Ordinance 97/2013 of 4 March.

### ***Apoio à contratação via Reembolso da TSU***

From July 2013 onwards, the two hiring incentives through reductions in social security contributions (*Apoio à Contratação via Reembolso da TSU* and *Apoio à contratação de desempregados com idade igual ou superior a 45 anos via reembolso da TSU*) were merged into one programme: *Apoio à contratação via Reembolso da TSU*.<sup>148</sup> There is no longer a minimum period of unemployment necessary for individuals to become eligible for the programme, and the maximum amount of the reimbursement has been equalised across all target groups (EUR 200). In addition, the programme has been extended to individuals aged 31 to 44 as long as they fulfil one of the following criteria: i) they are low-skilled (i.e. have not completed basic education); ii) they are single parents; or iii) they are in a workless household.

### ***Medida Estímulo Emprego***

All hiring subsidies cited above were merged into one programme, *Medida Estímulo Emprego*, from 25 July 2014 onwards.<sup>149</sup> In their current state, these subsidies have the following characteristics:

- Eligible individuals are those unemployed registered with the PES and who fulfil one of the following conditions:
  - Are in receipt of unemployment benefit
  - Are in receipt of income support
  - Have been unemployed for at least 60 consecutive days (in case of the unemployed aged 30 and under, or 45 and over), or inactive for the past 12 months
  - Have been unemployed for at least six consecutive months
  - Are living in a workless household
  - Are single parents
  - Have a disability
  - Are either a victim of domestic violence; or ex-convicts; or re-habilitated drug users
- Conditions on employers:
  - Offer a contract (full- or part-time; permanent or temporary, but of at least six months)
  - Generate net employment creation
  - Provide training during the period of the subsidy, either i) work-based under the supervision of a specially assigned tutor, or ii) externally in a certified training agency and for at least 50 hours
  - The person hired on a subsidy cannot have worked for the employer for the past 24 months
  - Cannot take on more than 25 subsidised workers on temporary contracts (but no limit on open-ended contracts)
- Value of the subsidy:
  - For temporary contracts: 80% of the IAS x (number of full months of the contract) / 2, capped at 80% of the IAS x 6. The 80% is replaced by 100% for the unemployed who are:

148. Ministerial Ordinance 204-A/2013 of 18 June.

149. Ministerial Ordinance 149-A/2014 of 24 July.

- ❖ Long-term unemployed (12 months or over)
  - ❖ Young (<30)
  - ❖ 45 or over
  - ❖ In receipt of unemployment benefit
  - ❖ Single parents
  - ❖ Living in a workless household
  - ❖ Either victims of domestic violence; or ex-convicts; or re-habilitated drug users
  - ❖ Have a disability
  - ❖ In receipt of income support
- For open-ended contracts: 110% x IAS x 12
  - In case of part-time contracts, the subsidy is calculated proportionally (on the assumption of a standard week of 40 hours)
  - In case a subsidised temporary contract is converted to a permanent one, the employer is entitled to the 6 x IAS paid at the percentage previously applicable (80% or 100%).

Table A3 summarises the main changes to these hiring subsidised over the past few years.

More recently, Ministerial Ordinance 84/2015 of 20 March introduced a new, financial incentive for the “Promotion of Gender Equality in the Labour Market” which consists in an increase in the value of the *Estímulo Emprego* of 20% (for a temporary contract) or 30% (in case of a permanent contract or conversion) in case the employer hires a worker from a sex that is under-represented in that particular profession (i.e. represents less than a third of all workers in that profession).

Table A3. Changes to hiring subsidies introduced during the crisis

	Estímulo 2012	Estímulo 2013	Estímulo Emprego
Date of introduction	14 February 2012	14 April 2013	25 July 2014
Legal text	Ministerial Ordinance No. 45/2012 of 13 February	Ministerial Ordinance 106/2013 of 14 March	Ministerial Ordinance 149-A/2014 of 24 July
Eligibility	unemployed 6+ months	unemployed 6+ months <b>unemployed 3+ months IF:</b> • no basic education • aged 45+ • workless household inactive past 12 months	unemployed (XXX)
Duration	6 months	6 months	6 months
Value	50% of wage 60% if: • on permanent contract • in receipt of income support • age <25 • disability • no basic education • long-term unemployed MAX 1x IAS	50% of wage 60% if: • on permanent contract • in receipt of income support • age <25 • disability • no basic education • long-term unemployed • age 50+ • under-represented gender MAX 1x IAS	0.8 x IAS x months/2 (capped at 0.8 x IAS x 6) if temporary contract 1.0 x IAS x months/2 (capped at 0.8 x IAS x 6) if temporary contract AND: • Long-term unemployed • Age <30 • Age 45+ • In receipt of unemployment benefit • Workless household • Victims of domestic violence; or ex-convicts; or re-habilitated drug users • In receipt of income support
Bonus for permanent contract		18 months subsidy MAX 1.3x IAS	1.1 x IAS x 12
Bonus for conversion to permanent contract		+ 9 months MAX 1x IAS	0.8 (or 1.0) x 6 x IAS (depending on previous situation)
	<b>Apoio à Contratação via Reembolso da TSU</b>	<b>Apoio à Contratação via Reembolso da TSU</b>	<b>Apoio à Contratação via Reembolso da TSU</b>
Date of introduction	4 August 2012	14 February 2013	18 July 2013
Legal text	Ministerial Ordinance 229/2012 of 3 August	Ministerial Ordinance 65-A/2013 of 13 February	Ministerial Ordinance 204-A/2013 of 18 June
Eligibility	Age 18-30 & long-term unemployed (≥ 12 months)	Age 18-30 and unemployed (≥ 6 months) <b>Age 18-30 and inactive (≥ 12 months)</b>	Age 18-30 and unemployed (XXX) Age 45+ and unemployed (XXX) <b>Age 31-44 IF:</b> • no basic education • workless household
Duration	18 months	18 months	18 months
Value	100% waiver of the Single Social Tax (Taxa Social Única) if hired on a permanent contract 75% waiver if hired on a temporary contract MAX EUR 175 per month	100% waiver of the Single Social Tax (Taxa Social Única) if hired on a permanent contract 75% waiver if hired on a temporary contract MAX EUR 175 per month	100% waiver of the Single Social Tax (Taxa Social Única) if hired on a permanent contract 75% waiver if hired on a temporary contract MAX EUR 200 per month
		<b>Apoio à Contratação via Reembolso da TSU 45+</b>	
Date of introduction		4 February 2013	
Legal text		Ministerial Ordinance 3-A/2013 of 4 January Ministerial Ordinance 97/2013 of 4 March	
Eligibility		<b>Age 45+ and unemployed (≥ 6 months)</b> <b>Age 45+ and inactive (≥ 12 months)</b>	
Duration		6-18 months	
Value		100% waiver of the Single Social Tax (Taxa Social Única) if hired on a permanent contract 75% waiver if hired on a temporary contract MAX EUR 200 per month	

## Subsidised internships

In addition to the hiring subsidies, the government introduced a number of new subsidised internship programmes, or changed existing ones.

### *Programa de Estágios Profissionais*

In February 2011, the subsidised internship programme (*Estágios Profissionais*)<sup>150</sup> was revised. It became targeted at: i) young people (aged 30 or under) who had completed levels 4, 5, 6, 7 or 8 of the National Qualifications Framework (QNQ); or ii) people aged 30+ who had been inactive for the past 12 months and who had completed levels 2, 3, 4, 5, 6, 7 or 8 of the QNQ less than three years ago; or iii) people with disabilities, regardless of their age. Internships lasted nine months and the intern was given a bursary commensurate with his/her level of education: 1 x IAS for those with level 2 of the QNQ; 1.2 x IAS for those with level 3; 1.3 x IAS for those with level 4; 1.4 x IAS for those with level 5; and 1.65 x IAS for those with levels 6, 7 or 8. The intern was also entitled to a food allowance. These costs were partially covered by the PES as follows: 75% for employers with fewer than ten employees; 65% for employers with between ten and 250 employees; and 40% for employers with more than 250 employees. The PES covered an additional 10% in case the intern had a disability. The employer remained responsible for the payment of taxes and social security contributions. Employers who, over a period of two years, had not absorbed at least one third of their interns into their regular workforce were not entitled to any further internships for a period of one year. In January 2013,<sup>151</sup> the *Estágios Profissionais* were extended to the unemployed who were either single parents or part of a workless household, irrespective of their age, and the PES covered 100% of the bursaries paid to these interns.

### *Passaportes Emprego*

Against the backdrop of the strategic plan to tackle youth unemployment, *Impulso Jovem*, launched in June 2012, the government set out the details of one of its measures, the *Passaportes Emprego*, in July 2012.<sup>152</sup> The *Passaportes Emprego* were a set of subsidised internship programmes aimed at youth (primarily aged between 18 and 30) who had been unemployed for at least four months. They lasted for a period of six months and needed to take place in one of the disadvantaged regions of Portugal.<sup>153</sup> Employers needed to provide training of at least 50 hours through a certified training centre, and needed to pay the intern a bursary commensurate with his/her level of education: 1.65 x IAS for those who had completed tertiary education; 1.25 x IAS for those who had completed at least secondary education; 1 x IAS for those who had not completed secondary education. In addition, the employer was expected to pay a food allowance and transport expenses. The PES would cover some (or all) of these expenses: 100% for the first intern if the employer had ten or fewer employees and 70% for the second; 70% also in case the employer had more than ten employees. In case the internship was converted into an open-ended contract, the employer would receive a reward equal to six times the monthly value of the bursary.<sup>154</sup>

150. Ministerial Ordinance 92/2011 of 28 February.

151. Ministerial Ordinance 3-B/2013 of 4 January.

152. Ministerial Ordinance 225-A/2012 of 31 July.

153. This geographical restriction was due to the fact that the measures included in the *Impulso Jovem* were financed by the European Social Fund. In reality, the *Passaportes Emprego* were also implemented in Lisbon, financed through the PES budget.

154. It is important to note that the *Passaporte Emprego* has a number of variations depending on the specific target group, and not all of these have been described here. For more detail, the reader is therefore referred directly to the Ministerial Ordinance itself.

### ***Harmonisation between Passaportes Emprego and the Estágios Profissionais***

In February<sup>155</sup> and March<sup>156</sup> 2013 the *Passaportes Emprego* and the *Estágios Profissionais* were more closely aligned with one another. Whereas the *Passaportes Emprego* would be aimed primarily at unemployed youth aged 18-25, the *Estágios Profissionais* would cover the unemployed aged 25-30 as well those aged 30+ if they have been inactive for the past year and obtained their qualification less than three years ago; or if they were single parents, living in a workless household, or had a disability. The duration of both programmes was increased to 12 months and the value of the bursaries were homogenised: 1 x IAS for those with level 2 of the QNQ; 1.2 x IAS for those with level 3; 1.3 x IAS for those with level 4; 1.4 x IAS for those with level 5; and 1.65 x IAS for those with levels 6, 7 or 8. The *Passaportes Emprego* were also extended to the whole of Portugal (being previously restricted to economically disadvantaged areas), the minimum unemployment spell durations for eligibility for the programme were eliminated, and the definition of training to be provided to the intern was broadened (it could now also be work-based).<sup>157</sup> Finally, the contributions of the PES for both programmes were revised as follows: 100% of the bursary for the first intern for employers with fewer than ten employees; 80% of the bursary for interns hired by employers with more than ten employees (as well as from the 2<sup>nd</sup> intern onwards in the case of employers with fewer than ten employees). In the case of the *Estágios Profissionais*, an additional 10% would be covered if the intern has a disability. In the case of the *Passaportes Emprego*, the employer would still be offered a financial reward if the internship was converted into an open-ended contract.

### ***Estágios Emprego***

*Passaportes Emprego* and *Estágios Profissionais* were replaced by *Estágios Emprego* from 18 July 2013 onwards.<sup>158</sup> The programme is aimed primarily at: i) youth aged 18-30 who are unemployed and registered with the Public Employment Service, and who hold a qualification of level 2-8 of the QNQ; as well as ii) those aged over 30 who are registered with the Public Employment Service, have completed a qualification of level 2-8 of the QNQ in the past three years, and have no social security record for the past 12 months. Individuals with a disability, those living in a workless household, and victims of domestic violence are also eligible, regardless of age and qualifications held. Internships last for a period of 12 months and interns are paid a bursary commensurate with their level of education (1 x IAS for those with level 2 of the QNQ; 1.2 x IAS for those with level 3; 1.3 x IAS for those with level 4; 1.4 x IAS for those with level 5; and 1.65 x IAS for those with levels 6, 7 or 8). 100% of this bursary is covered by the PES for first interns in firms with ten employees or less, and who are hired prior to 31 December 2014. In all other cases, 80% of the bursary is covered by the PES (increased to 90% if the intern has a disability).

### ***REATIVAR***

Ministerial Ordinance 86/2015 of 20 March introduces a new internship of six months (REATIVAR) aimed at the long-term unemployed aged over 30. The bursary received during the internship is in line with those of the *Estágios Emprego* covered by the PES: i) for 80% in the case of non-profit legal entities and for the first intern with an employer who has fewer than ten employees; ii) for 65% in all other circumstance. An additional 15% are covered in case the intern fulfils one of the following criteria: has

155. Ministerial Ordinance 65-B/2013 of 13 February.

156. Ministerial Ordinance 120/2013 of 26 March.

157. Note that there is no training requirement in the case of the *Estágios Profissionais*.

158. Decree 204-B/2013 of 18 June, as changed by Decree 375/2013 of 27 December and Decree 20/2014 of 30 January.

been unemployed for at least two years; is older than 45; has a disability; is a single parent; lives in a jobless household; is a victim of domestic violence; is an ex-convict; or is an ex-drug user in rehabilitation.

### ***Contratos Emprego-Inserção***

In place since 2009,<sup>159</sup> the Contrato Emprego-Inserção and Contrato Emprego-Inserção+ are subsidised internship programmes that aim to improve the socio-professional skills of disadvantaged unemployed individuals through a subsidised internship doing socially useful work. These internships can last up to 12 months and were initially aimed at the unemployed: with disabilities, aged 55+, who are ex-convicts, or who have been out of a job for more than a year (i.e. the long-term unemployed). There are two types of contract: the Contrato Emprego-Inserção is aimed at those who are in receipt of unemployment benefits; and the Contrato Emprego-Inserção+ is aimed at those receiving the guaranteed minimum income benefit (*rendimento social de inserção*).<sup>160</sup> Those in receipt of unemployment insurance receive a top-up equivalent to 20% of their unemployment benefits, while those in receipt of unemployment assistance receive a top-up equivalent to 20% of the IAS. In both these cases, and for private, not-for-profit organisations, the PES would cover 50% of these costs. Finally, those in receipt of just guaranteed minimum income benefit would receive a bursary equal to the IAS, covered 90% by the IEFP if the host institution is a private, not-for-profit organisation, and 80% if the host is a public entity (increased by an additional 10 percentage points in case the intern has a disability).

During the crisis, a few small changes were introduced to these programmes, primarily aimed at widening access to them:

- 1 June 2010: priority for participation in the programme is given to unemployed individuals whose income is equal or less than the minimum wage.<sup>161</sup>
- 19 April 2011: the bursary for unemployment insurance recipients is capped at 20% of the IAS.<sup>162</sup>
- 1 January 2014: prioritised groups now include those aged 45+ (as opposed to 55+); and the Contrato Emprego-Inserção+ is extended to those who do not receive either unemployment or guaranteed minimum income benefits, and who fulfil one of the following conditions: are long-term unemployed; or live in a workless household.<sup>163</sup>
- 31 January 2014: victims of domestic violence are included in the priority target group and, in case the individual receives unemployment benefit and is disabled, the PES covers 100% of the costs.<sup>164</sup>

### **Training programmes**

Two new, short-duration training programmes were introduced in 2013: *formação transversal* (a 25-hours training programme aimed at improving personal, communication, entrepreneurial and job search skills) and *Vida Ativa*.

159. Decree 128/2009 of 30 January.

160. Those that are simultaneously in receipt of unemployment benefits and the guaranteed minimum income benefit are eligible for the *Contrato Emprego-Inserção*.

161. Decree 294/2010 of 31 May.

162. Decree 164/2011 of 18 April.

163. Decree 378-H/2013 of 31 December.

164. Decree 20-B/2014 of 30 January.

### **Formação transversal**

*Formação Transversal – Ativação e Técnicas de Procura de Emprego* is a short module (25 hours) provided by the Public Employment Service which aims to boost the employability of job seekers by developing their personal, communication and job search skills.

### **Vida Ativa**

*Vida Ativa*<sup>165</sup> is targeted at: those who have been unemployed for six months or more; low-skilled unemployed (whose qualifications are below levels 1 or 2 of the QNQ); and those in jobless households. The intervention consists of part-time, short, modular training courses (lasting between 25 and 300 hours) during which the participant is expected to continue actively looking for work. Where possible, these training courses are supplemented with practical, work-based training for a period of 3-6 months (extended exceptionally to a period of 12 months). Where appropriate, the intervention may consist instead in the validation of existing skills. Participation in *Vida Ativa* should start no later than three months after registration with the Public Employment Service.

### **Youth**

#### ***Impulso Jovem***

In June 2012,<sup>166</sup> the government launches its strategic plan to tackle youth unemployment, *Impulso Jovem* (which would later turn into the Youth Guarantee), built on four pillars: internships (*Estágios Emprego*), hiring incentives (*Apoios à Contratação*), vocational training (*Formação Profissional*) and entrepreneurship support (*Empreendedorismo*). More specifically, the measures announced as part of this plan include:

- *Passaporte Emprego*: internships for unemployed youth, combined with a hiring incentive should the employer subsequently hire the young person on an open-ended contract.
- Incentives for hiring long-term unemployed youth through reductions in social security contributions.
- *Passaporte para o Empreendedorismo* and *Portugal Empreendedor*: covering a range of interventions to promote youth entrepreneurship and firms hiring highly-skilled youth who have been unemployed for four months or more.
- *COOP Jovem*: supporting the creation of co-operatives through direct financial support to each worker aged between 18 and 30 years, and who have completed the first cycle of basic education.
- Development of a national microcredit programme which provides technical support and training of the entrepreneur during the first years of operation, giving priority to individuals aged between 16 and 34 and who have been registered as unemployed for at least four months.<sup>167</sup>
- Investment support, including a component to facilitate access to finance for small- and medium-sized enterprises.

165. Decree 203/2013 of 17 June.

166. Cabinet Resolution 51-A/2012 of 14 June.

167. The microcredit programme already existed (Ministerial Ordinance 985/2009 of 4 September). The Ministerial Ordinance 95/2012 of 4 April amended it to give priority to those aged 16-34 enrolled as unemployed in the PES for at least four months (the target group of the first edition of the *Impulso Jovem*).

One year later, the strategic plan was revised in an attempt to rationalise and simplify the various policy instruments.<sup>168</sup> In particular, with respect to hiring incentives, the link was made with *Estímulo 2013* and the *Apoio à Contratação via Reembolso da TSU*.

### ***Youth Guarantee***

At the end of 2013, the Portuguese Government announced the *Youth Guarantee*, which encompasses all measures cited above aimed at young people, as well as others.<sup>169</sup>

### ***Emprego Jovem Ativo***

The programme *Emprego Jovem Ativo* was introduced in September 2014<sup>170</sup> and is a six-months-long work experience/group apprenticeship programme which involves a co-ordinator, a highly-skilled unemployed youth (with a university degree) as well as 2-3 low-skilled unemployed youths (who have not completed basic education). Participants need to be aged between 18 and 29 and registered with the Public Employment Service. For low-skilled youth, the programme provides an opportunity to acquire a range of professional as well as soft skills. For high-skilled youth, the programme aims to provide an opportunity to gain management skills. For the duration of the programme, participants receive a monthly bursary (0.7 x IAS for low-skilled youths and 1.3 x IAS for high-skilled youths), covered entirely by the PES and there is no need for employers to contribute to social security.

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168. Cabinet Resolution 36/2013 of 4 June.

169. Cabinet Resolution 104/2013 of 31 December.

170. Ministerial Ordinance 150-2014 of 30 July.

## ANNEX B

### TIMELINE OF REFORMS

2011	January	1 January - increase in the MW from EUR 475 to EUR 485
	February	
	March	
	April	
	May	17 May - Government signs the Memorandum with the Troika
	June	
	July	
	August	
	September	
	October	
	November	1st reduction in severance pay (cut-off: 1 November) - Law 53/2011 of 14 October
	December	
2012	January	11 January - first exceptional extension of temporary contracts - Law 3/2012 of 10 January (applying to contracts expiring by the end of June 2013)
	February	14 February - Launch of Estímulo 2012 hiring subsidy - Ministerial Ordinance No. 45/2012 of 13 February
	March	Launch of the Modernisation of the Public Employment Service - Cabinet Resolution No. 20/2012 of 9 March
	April	1 April - changes to unemployment benefits - Decree-Law 64/2012 of 15 March
	May	
	June	
	July	1 July - introduction of a contributory system of unemployment protection for the dependent self-employed - Decree-Law 65/2012 of 15 March
	August	1 August - Changes in reasons for dismissal - Law 23/2012 of 25 June 1 August - Extension of duration of contracts of very short duration Reduction in compensation for overtime - Law 23/2012 of 25 June Speeding up the procedures for implementing short-time working arrangements
		4 August - Launch of Apoio à Contratação via Reembolso da TSU subsidy - Ministerial Ordinance 229/2012 of 3 August
		5 August - UB recipients can keep part of their unemployment benefit if they accept a low-paid job - Decree-Law 207/2012 of 6 July
	September	
	October	
	November	2nd reduction in severance pay (cut-off: 1 November) - Law 23/2012 of 25 June 1 November - introduction of criteria for the extension of collective bargaining agreements - Cabinet Resolution 90/2012 of 31 October 2012
	December	
2013	January	
	February	14 February - revision of Apoio à Contratação via Reembolso da TSU - Ministerial Ordinance 65-A/2013 of 13 February 14 February - launch of Apoio à contratação de desempregados com idade igual ou superior a 45 anos via reembolso da TSU - Ministerial Ordinance 3A/2013 of 4 January
	March	
	April	15 April - Introduction of Estímulo 2013 - 106/2013 of 14 March
	May	
	June	
	July	18 July - Apoio à contratação via Reembolso da TSU - Ministerial Ordinance 204-A/2013 of 18 June
	August	1 August - workers' councils in firms with at least 150 employees can negotiate plant-level agreements - Decree-Law 189/2012 of 22 August
	September	Constitutional Court rules unconstitutional the new criteria for selecting workers to be dismissed in case of extinction of a work post - Decision nº 602/2013 of 20 September 2013 Constitutional Court rules unconstitutional the removal of the requirement to find another suitable job for a worker before being dismissed - Decision nº 602/2013 of 20 September 2013 1 September - strengthened enforcement of laws around dependent self-employment - Law 63/2013 of 27 August
	October	3rd reduction in severance pay (cut-off: 1 October) - Law 69/2013 of 30 August Introduction of dismissal funds - Law 70/2013 of 30 August Incentivo Emprego - Ordinance nº 286-A/2013 of 16 September
	November	8 November - second exceptional extension of temporary contracts - Law 76/2013 of 7 November (applying to contracts expiring 7 November 2015)
	December	
2014	January	
	February	Relaxation of rules to set up private employment and temporary work agencies - Law 5/2014 of 12 February
	March	
	April	
	May	
	June	Re-revised criteria for selecting worker to be dismissed in case of extinction of a work post - Law 27/2014 of 8 May Reintroduction of requirement to find another suitable job for a worker before being dismissed - Law 27/2014 of 8 May Criteria for the extension of collective bargaining agreements revised - Cabinet Resolution 43/2014 of 27 June 2014
	July	25 July - Medida Estímulo Emprego - Ministerial Ordinance 204-A/2013 of 18 June - Ministerial Ordinance 149-A/2014 of 24 July
	August	
	September	1 September - validity period of cessation clauses in collective bargaining agreements reduced - Law 55/2014 of 25 August 1 September - introduction of possibility to temporarily suspend collective agreements in times of crisis - Law 55/2014 of 25 August
	October	1 October - increase in the MW from EUR 485 to EUR 505 1 October - Temporary decrease of 0.75 percentage points in employer social security contributions on minimum-wage workers who were hired no later than May 2014
	November	
	December	
2015	January	
	February	
	March	21 March: introduction of a financial incentive for the "Promotion of Gender Equality in the Labour Market" - Decree 84/2015 of 20 March 21 March: introduction of financial support to promote geographical mobility - Decree 85/2015 of 20 March 21 March: introduction of REATIVAR - Decree 86/2015 of 20 March
	April	
	May	
	June	
	July	
	August	
	September	
	October	Revision of dismissal funds (limit contributions to 50% of SP) - Decree-Law 210/2015 of 25 September
	November	
	December	

## ANNEX C

### THE IMPACT OF SEVERANCE PAY REFORMS IN PORTUGAL ON ON-THE-JOB SEARCH AND WORKER FLOWS

#### Introduction

As part of the labour market reforms, Portugal significantly reduced the severance pay entitlements of workers (and of new hires in particular – see Chapter 1 and Annex A for further detail). The primary objective of these reforms was to encourage a more efficient re-allocation of labour resources. With lower severance pay entitlements, workers might be less reluctant to switch jobs, resulting in increased on-the-job search and job-to-job flows. For employers, lower severance pay could increase both hiring and firing rates. However, as a result of grandfathering<sup>171</sup>, accumulated severance pay entitlements were preserved by the reform. One would therefore expect the largest (short-run) effects of the reform to be on hiring only (and possibly on the firing/job-to-job moves of new hires). In addition, because the reduction in severance pay was larger for permanent than for temporary contracts, one might expect to see an increase in the share of hiring that is on permanent contracts. At the same time, it is important to remember that severance pay was cut for both types of contract, and so the reform should have encouraged hiring on temporary as well as on permanent contracts.

Table C1 shows the implications of the reforms in terms of the average severance pay entitlements of existing and new workers, respectively, as well as by type of contract. For each of these breakdowns, the table shows three different severance pay estimates:

1. What severance pay would have been like under the old rules (“old”);
2. Actual severance pay the worker is currently entitled to (“actual”); and
3. What severance pay would be like if the new rules applied fully – i.e. without any grandfathering (“new”).

Box C1 provides further detail on how these severance pay indicators are derived, and some of the assumptions that needed to be made in the process.

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171. Grandfathering refers to the exemption of some individuals from a new regulation that prohibits or restricts something. In the present case, many of the new severance pay rules applied to new hires only, and not to existing workers.

### Box C1. Construction of the severance pay variables for the analysis

Quarterly European Labour Force Survey (EU-LFS) data on start date, contract type and duration of temporary contracts were used to calculate the number of months of severance pay each individual is entitled to under the current/actual rules, as well as what they would be entitled to under the old and new rules, respectively. As the EU-LFS does not contain information on wages, the rules concerning the maximum base wage for the calculation of the severance pay entitlement (i.e. 20 times the minimum wage) could not be taken into account (although severance pay was still capped at 12 months). Given that only a very small fraction of employees have wages higher than 20 times the minimum wage, the severance pay calculation will not be strongly affected by this simplification.

The same methodology was applied to the annual *Quadros de Pessoal* (QP) data, which have the advantage that the exact survey and starting dates are known, making the calculation more precise. However, the QP data contain no information on the duration of temporary contracts, which made it necessary to assume that all temporary workers had contracts of less than six months.

Table C1 confirms that the first reform (1 November 2011) had no impact on the actual severance pay entitlements of existing workers, but did change the entitlements of newly hired workers substantially compared to what they would have received under the old rules (primarily as a result of the removal of the 3-month minimum severance pay entitlement). While the second reform (1 November 2012) did not change anything else for new hires, it lowered the rate at which severance pay entitlements of existing workers would be accumulated, and also introduced a cap. This explains the small drop in actual severance pay of existing workers compared to what they would have received under the old rules. Finally, the third reform (1 October 2013) had an impact on both new and existing workers by further reducing the rate at which severance pay would be accumulated. For existing workers, this led to another small reduction in average severance pay. For new hires, the average after the third reform is much lower than that observed after the previous two reforms because it reflects severance pay accumulated over a maximum of three months only.<sup>172</sup>

Table C1. Average severance pay entitlements (number of days) after each reform, by type of worker and contract type: Old, new and actual rules

		Permanent contracts			Temporary contracts		
		1 <sup>st</sup> reform	2 <sup>nd</sup> reform	3 <sup>rd</sup> reform	1 <sup>st</sup> reform	2 <sup>nd</sup> reform	3 <sup>rd</sup> reform
Existing employees	Old	363.93	371.26	365.14	73.92	76.5	60.65
	Actual	363.93	361.04	342.97	73.92	60.57	44.21
	New	202.97	207.08	140.58	53.15	53.79	38.62
New hires	Old	90	90	90	7.39	6.45	1.44
	Actual	5.60	5.01	0.35	4.46	4.01	0.83
	New	5.60	5.01	0.35	4.46	4.01	0.83

Note: Estimates are based on the European Labour Force Survey Q1 2011-Q4 2013. The averages in each column are calculated based on all individuals observed after the relevant reform, but before the next reform (or end of sample). For example, for the calculation of the values of the second reform, all individuals surveyed over the period 11/2012 to 9/2013 are included. New hires are defined as workers with tenure shorter than three months.

Source: OECD analysis based on the EU-LFS.

172. This is because the data used for these estimates stop in Q4 2013. Note that this will not matter for the regressions that are run later in this section because the explanatory variable used measures the percentage difference with what an individual would have received under the old rules (which will be equally low).

This annex presents some initial evidence on the impact that these changes in severance pay might have had on on-the-job search and worker flows. The results obtained here need to be interpreted with care because: i) the reforms were implemented very recently and their full impact on the labour market might not be observable yet; ii) the nature of the reforms means that it was not possible to identify clear treatment and control groups, and therefore the causality of the observed effects cannot be established with full certainty. That being said, three separate approaches are presented below, and the findings are surprisingly consistent with one another (as well as robust to a falsification exercise): the severance pay reforms appear to have had only a small effect on firing (which appears to be concentrated on new hires only); a positive effect on hiring (although this finding is less robust to the falsification test); and a positive effect on the share of hiring that is permanent. All these effects appear larger for small firms (with fewer than 50 employees). The estimates also suggest that workers most affected by the reforms are more likely to be engaged in on-the-job search. At the same time, there is some indication that workers in firms most affected by the reforms experienced lower wage growth. Overall, these results indicate that the reforms of severance pay in Portugal were beneficial for both worker reallocation and labour market duality. However, the findings are only preliminary and further research will be required to confirm them.

### **The impact of the severance pay reforms on on-the-job search and worker flows: Evidence from the European Labour Force Survey**

Table C1 summarised the estimated effects of the new severance pay rules on the average entitlements of different types of worker (existing employees and new hires) as well as by type of contract. The basic idea behind the analysis in this section is to exploit variation in the depth of these reforms (i.e. the percentage difference between the old and actual/new severance pay) and estimate its impact on the labour market outcomes of different individuals/occupations. For example, one would expect to observe a higher probability of on-the-job search for those individuals for whom the difference between actual severance pay and that which they would have received under the old rules is greatest. Similarly, employers might be more likely to fire workers for whom the reforms have meant the greatest reduction in severance pay (as measured by the difference between actual severance pay and what they would have been entitled to under the old rules). As far as hiring is concerned, employers will be more forward-looking and interested in the new rules (applying to new hires) rather than the actual rules (applying to existing workers). In this case, therefore, one would expect to see more hiring among employers where the difference in severance pay between the old and new rules is the greatest. Finally, one might expect to see an increase in the share of hiring that is on permanent contracts amongst those employers who saw a larger fall in severance pay for permanent workers than for temporary ones.

This section uses the EU-LFS to test the above hypotheses. The advantage of the EU-LFS (compared to the *Quadros de Pessoal* data discussed in the next section) is that observations are available on a quarterly basis (i.e. relatively frequently). On the downside, the data are not longitudinal so that individuals and employers cannot be followed over time. In addition (and as explained below), most of the analysis needs to be done at the more aggregated occupational level (as opposed to the firm as in the *Quadros de Pessoal*).

To analyse the impact of severance pay on the probability of on-the-job search, the following individual-level regression model is used:

$$Y_{it} = \beta_0 + \beta_1 \Delta \log(SP_{it}) + \sum_{c>1} \beta_c X_{cit} + \gamma_t + \mu_q + \varepsilon_{it} \quad (1)$$

Where  $Y_{it}$  is a dummy variable indicating whether individual  $i$  is engaged in on-the-job search at time  $t$ , and  $\Delta \log(SP_{it})$  is the percentage difference between the old and actual severance pay. The regression further controls for individual characteristics,  $X_{it}$  (age, gender, country of birth, region, educational

attainment, industry, occupation, tenure and contract type<sup>173,174,175</sup>), as well year ( $\gamma_t$ ) and quarter ( $\mu_q$ ) fixed effects.

While the on-the-job search analysis is run at the individual level, this is not possible for the regressions looking at hiring (the percentage of workers at time  $t$  with tenure less than three months) and employment outflows (the percentage of individuals who, at time  $t$ , had been unemployed or inactive for less than three months).<sup>176</sup> This is because, by definition, severance pay cannot be calculated when the individual is unemployed/inactive (i.e. tenure is non-existent/missing). For these outcome variables, the analysis is run at the occupation level (30 groups)<sup>177</sup> and the model becomes:

$$Y_{gt} = \beta_0 + \beta_1 \Delta \log(SP_{gt}) + \sum_{c>1} \beta_c X_{cgt} + \gamma_t + \delta_g + \mu_q + \delta_g \cdot \mu_q + \varepsilon_{it} \quad (2)$$

Where the explanatory variable,  $\Delta \log(SP_{it})$ , and the control variables are all transformed into within-group averages, and group fixed effects,  $\delta_g$ , as well as group-specific seasonal effects,  $\delta_g \cdot \mu_q$ , are added to the equation. In the case of hiring, the explanatory variable is defined as the percentage difference between the old and *new* severance pay (as opposed to the difference between old and *actual* severance pay used in the case of employment outflows).

The final model looks at the impact of the reforms on the share of hires that are permanent. The set-up is identical to the one in equation (2) and is run at the group-level, except that the explanatory variable now becomes the difference between the average  $\Delta \log(SP_{gt})$  for permanent workers and the average  $\Delta \log(SP_{gt})$  for temporary workers within an occupation. This is because, in making decisions about

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173. Controls for tenure and contract type are included to correct for composition effects. Without these, one concern might be that the occupation-level results are biased due to reverse causality (i.e. changes in the outcome variable having an impact on the explanatory variable  $\Delta \log(SP_{it})$ ). Indeed, given that  $\Delta \log(SP_{it})$  is defined as a within-group average, its value is determined not only by the severance pay rules, but also by the composition of employment. While the conclusions remain essentially unchanged when controlling for composition effects, the size of the coefficients is always smaller, suggesting that there may indeed be some reverse causality. Adding in an interaction between tenure and contract type has little effect on the results. In alternative models (not shown here) the composition effect was addressed by reweighting the data so that the composition remains constant at the average level throughout the time period analysed. These results were qualitatively very similar to the ones presented here.
174. The tenure groups are defined as: < 3 months, 3-6 months, 6-12 months, 1-2 years, 2-4 years, 4-6 years, 6-8 years, 8-10 years, 10-15 years, 15-20 years, 20-25 years, 25-30 years, and 30+ years. The contract type groups are defined as: permanent; temporary with a duration of less than six months; and temporary with a duration of six months or more.
175. Also controlling for the level of severance pay makes little difference to the results. This is not surprising given that both tenure and contract type (which jointly determine severance pay) are already included in the regression.
176. With the EU-LFS data, one can look at hiring (i.e. whether an individual has tenure shorter than three months). In this case, flows from all previous states are included (i.e. inactive, unemployed, or employed in another job). The EU-LFS also allows one to look at employment outflows. In this case, only moves into either inactivity or unemployment can be observed. So outflows are defined as individuals who have moved from employment into either inactivity or unemployment in the past three months. Note that, because these variables are defined at the occupation level, they can be interpreted as hiring and employment outflow rates.
177. Occupations are defined at the 2-digit ISCO level. Some 2-digit occupations are clustered (within the same 1-digit occupation) to ensure a sufficient number of observations. The occupation of a non-employed person is defined as the occupation of his/her last job.

whether to take on permanent or temporary workers, employers are likely to consider by how much severance pay under the new rules fell for permanent contracts compared to temporary ones.

Table C2 reports the estimated coefficients on the severance pay variable,  $\beta_1$ , for each different outcome using EU-LFS data for the period Q1 2011-Q4 2013.<sup>178</sup> The results can be interpreted as the percentage point change in the outcome of interest for a 1-percentage point increase in the difference in severance pay before and after the reform (or, in the case of the last column, of a 1-percentage point increase in the difference in severance pay reduction between permanent and temporary contracts). The results in Table C2 confirm the expected impact of a reduction in severance pay: i) on-the-job search increases; ii) hiring increases; and iii) the fraction of hiring on permanent contracts increases (although the coefficient is only marginally significant). By contrast, the impact on flows out of employment is insignificant.<sup>179,180</sup>

**Table C2. The impact of the severance pay reforms on on-the-job search and worker flows: Evidence from the EU-LFS**

	Individual level	Group level		
	On-the-job search	Employment outflows	Hiring	Share permanent hiring
$\Delta \log(\text{SP}_{gt})$ : old v. actual rules	0.075***	-0.037		
$\Delta \log(\text{SP}_{gt})$ : old v. new rules			0.131**	
$\Delta \log(\text{SP}_{gt}^{\text{perm}}) - \Delta \log(\text{SP}_{gt}^{\text{temp}})$ : old v. new rules				1.077*

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the occupation-year level. Agricultural and public sectors excluded.

Source: OECD analysis based on the EU-LFS.

178. While earlier data is available, the analysis only starts in Q1 2011 because of a methodological break in the Portuguese Labour Force Survey.
179. The analysis presented in Table C2 considers all the reforms of severance pay simultaneously. Regressions have also been run on each of the reforms separately. While excluding the first or third reform has no substantial impact on the coefficients for on-the-job search and employment outflows, the exclusion of the first reform leads to a slightly lower and less significant coefficient on hiring. This confirms the importance of the first reform in encouraging hiring. The impact of the difference between permanent and temporary severance pay entitlement on the share of permanent workers becomes insignificant when excluding the third reform, which is consistent with the fact that severance pay entitlement for new workers became higher for temporary workers than for permanent workers following this last reform.
180. The interpretation of the size of these coefficients is not straightforward, but providing some population averages may help. The average difference between old and actual severance pay is 5.3%, while 6.6% of workers are engaged in on-the-job search. Against this background information, lowering severance pay by 1 percentage point would increase on-the-job search by 0.075 percentage points. Turning to hiring, 3.8% in each quarter are new hires. The average difference between old and new severance pay is 29.6% and the results indicate that a 1-percentage point increase in this gap results in a 0.13-percentage point increase in the hiring rate. This is a relatively large effect, but may be consistent with the fact that unemployment in Portugal in the recovery has been falling considerably faster than what would have been predicted based on the past relationship between unemployment and GDP growth (see Chapter 3). In addition, this coefficient should be seen as an upper bound on the possible effect of the reform. More realistically, assuming that there is no effect on the occupation with the smallest change in severance pay and anchoring all estimates on this occupation, the reform would expect to result in a 0.23-percentage point increase in the hiring rate on average. Finally, 17.7% of hires are on permanent contracts, and the average difference between the reduction in permanent and temporary severance pay is 8.8 percentage points. The results show that a 1-percentage point increase in this difference would result in 1-percentage point increase in hiring on permanent contracts.

While there is no clear identification strategy which would allow these results to be interpreted as causal, a robustness check is run which does provide additional confidence that they may be attributed to the reform. More specifically, as a falsification exercise, the same regressions are run again, but tenure levels and contract type are randomised for each individual (while keeping their labour market outcomes unchanged).<sup>181</sup> Using these random tenure levels and contract types, a new explanatory variable measuring the difference between the pre- and post-reform severance pay systems is estimated. If the relationships observed in Table C2 persist despite the randomisation, then one should worry that those effects are not truly caused by the reform. Table C3 shows that, with the randomised severance pay variable, all the coefficients that were significant in Table C2 turn insignificant, while the insignificant coefficient on outflows becomes significant, the sign is the opposite of what the theory would predict. Perhaps the only coefficient for which the falsification exercise is less convincing is the one on hiring: while the estimate turns insignificant, the size of the coefficient is very similar (even slightly larger) to the one obtained in Table C2. Overall, however, the results from this falsification exercise support the argument that the effects observed are linked to the reform.

Table C3. **The impact of the severance pay reforms on on-the-job search and worker flows: Falsification exercise with randomised tenure and contract type (EU-LFS)**

	Individual level	Group level		
	On-the-job search	Employment outflows	Hiring	Share permanent hiring
$\Delta \log(SP_{gt})$ : old v. actual rules	0.001	-0.109*		
$\Delta \log(SP_{gt})$ : old v. new rules			0.148	
$\Delta \log(SP_{gt}^{perm}) - \Delta \log(SP_{gt}^{temp})$ : old v. new rules				-0.01

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the occupation-year level. Agricultural and public sectors excluded.

Source: OECD analysis based on the EU-LFS.

### The impact of the severance pay reforms on hiring and separations: Evidence from the *Quadros de Pessoal*

As an additional robustness check on the findings presented in the previous section, the analysis is re-run on the *Quadros de Pessoal* (QP) data, a matched employer-employee administrative dataset. The advantages of this dataset compared to the EU-LFS are that it covers all non-public sector employees (it is a census, not a survey) and allows for the analysis to be carried out at the firm-level rather than at the more aggregate occupation-level. The disadvantages, however, are that the dataset is annual and that only the individuals working on October 31<sup>st</sup> of each year are observed. This implies that flows during the year (e.g. individuals hired and fired between October 31<sup>st</sup> of year  $t$  and October 31<sup>st</sup> of year  $t-1$ ) will not be captured. This is a problem for temporary contracts in particular. In addition, for reasons further explained below, the effect of the 1 November 2011 reform on separations cannot be estimated.

181. The randomisation works as follows. First, individuals are ordered randomly within time periods (i.e. quarter and year) and contract type groups, and are given the tenure level of the individual ranked one position below them (within the same time/contract group). In the next step, individuals are ordered by tenure within time periods, and the individual are given the contract type (temporary or permanent) of the individual ranked one position below them (within the same time period). By first assigning tenure (within contract type groups) and then only contract type, situations are avoided where, for example, individuals on temporary contracts might have very high tenure.

The outcomes that one is able to investigate using the QP data are slightly different from those in the EU-LFS.<sup>182</sup>

- Separations (i.e. the share of employees who were employed by the firm in year  $t-1$  but not in year  $t$ );
- Hiring (the share of employees who were employed by the firm in year  $t$  but not in year  $t-1$ );
- Share of hires that are permanent.

The basic model is re-defined at the firm-level:

$$Y_{jt} = \beta_0 + \beta_1 \Delta \log(SP_{jt}) + \sum_{c>1} \beta_c Z_{cjt} + \gamma_t + \delta_j + \varepsilon_{it} \quad (3)$$

Where  $Y_{jt}$  is the employment outcome for firm  $j$  at time  $t$  and  $\Delta \log(SP_{jt})$  is the average percentage difference in severance pay between the pre- and post-reform systems. As in the EU-LFS analysis, the difference between old and actual severance pay is used in the separations regressions, while the difference between old and new severance pay is used in the hiring regressions.<sup>183</sup> Just as before, the impact of the share of hiring that is permanent is analysed using the difference in severance pay reductions between permanent and temporary contracts. The regression further controls for time-varying firm characteristics,  $Z_{jt}$ , (such as the type of collective bargaining coverage<sup>184</sup> and productivity<sup>185</sup>), as well as firm and year fixed effects.

Table C4 reports the estimated coefficients on the severance pay variable,  $\beta_1$ , for each different outcome for the period 2010-2013. As before, the results can be interpreted as the percentage point change in the outcome of interest of a 1-percentage point increase in the difference in severance pay before and after the reform (or of a 1-percentage point increase in the difference in severance pay reductions between permanent and temporary for the last column). The results show that firms that experience a larger fall in the severance pay level of their employees exhibit a higher separation rate. Although significant, the value of the coefficient is relatively small and will partly reflect the higher tendency of on-the-job search found in the LFS analysis (and therefore increased job-to-job flows). The results in Table C4 further show that firms that anticipate a bigger drop in severance pay levels for their future employees have a higher hiring rate. Finally, the results indicate that the severance pay reforms may have had a positive impact on the share of permanent workers. Overall, these results are remarkably similar to the ones obtained using the LFS data.<sup>186</sup>

182. Note that, while the definition of hiring is similar to the EU-LFS definition, the separations definition is broader as it also refers to individuals moving to another job. The separations and hiring rates on the QP data are therefore more comparable to one another, and the results clearly show that the effect of the reforms on hiring is significantly larger than the effect on separations. This may be a result of grandfathering.

183. The first reform had no impact on the severance pay of existing workers. Any effect of the reform on separations would therefore only occur on individuals who are hired after the reform. However, because the QP only records individuals in employment in October of each year, anyone who joins a firm and leaves again during the year will not be captured. As such, the QP data cannot be used to estimate the effect of the 2011 reforms on separations.

184. Share of uncovered workers, share of workers covered by firm-level agreements, and share of workers covered by sector/national agreements (base category).

185. Productivity is defined as the firm's turnover divided by the number of employees.

186. Again, it is not straightforward to interpret the magnitude of these effects. Starting with separations, 14.2% of workers separate from their employer each year. At the same time, the average difference between old and

**Table C4. The impact of the severance pay reforms on hiring and separations: Evidence from the *Quadros de Pessoal***

	Employment outflows	Hiring	Share permanent hiring
$\Delta \log(SP_{gt})$ : old v. actual rules	0.043***		
$\Delta \log(SP_{gt})$ : old v. new rules		0.292***	
$\Delta \log(SP_{gt}^{perm}) - \Delta \log(SP_{gt}^{temp})$ : old v. new rules			0.624***

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the firm level. Agricultural and public sectors excluded.

Source: OECD analysis based on the *Quadros de Pessoal*.

To test the robustness of these results, a falsification exercise similar to that run on the EU-LFS data is also run on the QP. Randomising the tenure levels and contract types of employees leads to strongly different results, with all coefficients changing sign (Table C5). As before, this strengthens the case for ascribing the effects observed in Table C4 to the severance pay reforms. Even the coefficient on hiring is now much smaller, and changes sign.

**Table C5. The impact of the severance pay reforms on hiring and separations: Falsification exercise with randomised tenure and contract type (*Quadros de Pessoal*)**

	Employment outflows	Hiring	Share permanent hiring
$\Delta \log(SP_{gt})$ : old v. actual rules	-0.037***		
$\Delta \log(SP_{gt})$ : old v. new rules		-0.054***	
$\Delta \log(SP_{gt}^{perm}) - \Delta \log(SP_{gt}^{temp})$ : old v. new rules			-0.015

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the firm level. Agricultural and public sectors excluded.

Source: OECD analysis based on the *Quadros de Pessoal*.

The model was also run separately for small firms (fewer than 50 employees) and large ones (50 employees or more). The results, presented in Table C6, show that most of the effect of separations occurs in small firms – which suggests that these firms might be particularly constrained by high firing costs, which could impede their productivity and growth. The impact of the reform on hiring and the share of hiring that is permanent is significant in both types of firms, although the effects are larger for small ones.

actual severance pay in the QP data is 5.6%, and the results show that 1-percentage point increase in this difference results in a 0.04-percentage point increase in the separation rate. Turning to hiring, 16.2% of workers are new hires each year, while the average difference between old and new severance pay is 25.6%. The results show that a 1-percentage point increase in this difference is associated with a 0.29-percentage point increase in the hiring rate. Finally, the average share of hiring that is permanent is 46.9%, while the difference in severance pay reduction for permanent and temporary contracts is 3.4 percentage points. A 1-percentage point increase in this difference would increase the share of hiring that is permanent by 0.6 percentage points.

Table C6. The impact of the severance pay reforms on hiring and separations, by firm size (*Quadros de Pessoal*)

	Small firms (<50)			Medium and large firms (≥50)		
	Employment outflows	Hiring	Share permanent hiring	Employment outflows	Hiring	Share permanent hiring
$\Delta \log(SP_{gt})$ : old v. actual rules	0.044***			-0.073		
$\Delta \log(SP_{gt})$ : old v. new rules		0.293***			0.172***	
$\Delta \log(SP_{gt}^{perm}) - \Delta \log(SP_{gt}^{temp})$ : old v. new rules			0.658***			0.300***

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the firm level. Agricultural and public sectors excluded.

Source: OECD analysis based on the *Quadros de Pessoal*.

Finally, the model was used to test whether the severance pay reforms affected wage growth at the firm-level. One can imagine that workers in firms most affected by the severance pay reforms would lose in bargaining power over wages as their likelihood of being fired has increased. Indeed, the results presented in Table C7 indicate that firms with a larger average gap between old and actual severance pay have lower wage growth. By contrast, the average firm-level gap between old and new severance pay has no effect on wage growth – as might be expected.

Table C7. The impact of the severance pay reforms on wage growth (*Quadros de Pessoal*)

	Hourly wage growth	Hourly wage growth
$\Delta \log(SP_{gt})$ : old v. actual rules	-0.030**	
$\Delta \log(SP_{gt})$ : old v. new rules		0.016

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the firm level. Agricultural and public sectors excluded. Hourly wage calculated as the sum of base wages, overtime wages and other payments, divided by the sum of normal and overtime hours.

Source: OECD analysis based on the *Quadros de Pessoal*.

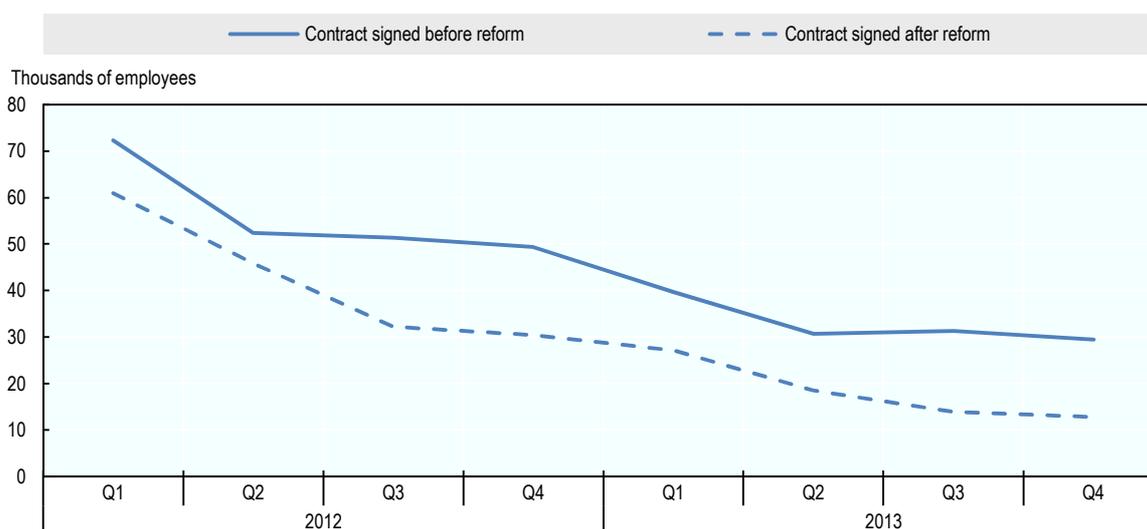
### The impact of the severance pay reforms on individual employment survival: Evidence from the European Labour Force Survey

This final section homes in on the question of whether lower severance pay results in higher job separations. It does this by exploring detailed information from the EU-LFS on the starting date of contracts to analyse differences in employment survival between employees who signed their contract just before the 1 November 2011 reforms and those who signed just after. Employees who signed a contract on or after that date would accumulate severance pay entitlements at a slower rate than those who signed their contract before that date, and also no longer have an entitlement to a minimum of three months' severance pay. As such, one would expect to see higher separation rates for workers hired after 1 November 2011 because: i) employers would be more likely to fire them; and ii) the workers themselves may be less reluctant to leave their job.

To make sure that the “treated” individuals (i.e. those who signed their contract after the reform) in the analysis are as similar as possible to the “control” individuals (i.e. those who signed their contract before the reform), a short time window around the reform date is chosen. More specifically, the sample is restricted to employees who signed their contract in the two months prior to the reform and in the two months after (i.e. it includes any contract signed over the period September to December 2011). Figure C1 shows the evolution of the number of employed people in both the control and the treatment groups. As expected, both groups reduce in size as time passes. However, Figure C1 also suggests that the gap

between the two groups of employees may have widened slightly over time and that the line for “treated” individuals is slightly steeper – which indicates that the workers hired under the new severance pay system are fired or leave their job more easily.

Figure C1. Evolution of the number of workers who signed their contract just before or just after the 1 November 2011 severance pay reform



Source: OECD analysis based on the EU-LFS.

To test this hypothesis more formally the following regression setup is used:

$$Y_{it} = \beta_0 + \beta_1 t + \sum_{c>2} \beta_c X_{cit} + \varepsilon_{it} \quad (4)$$

Where  $Y_{it}$  is a dummy variable equal to one if an employee belongs to the treatment group and zero when he/she belongs to the control group. The variable of interest,  $t$ , is a simple linear time trend, and the regression also controls for individual characteristics (age, skills, gender, contract type and region). As such, this model tests whether the share of employees who signed their contract after 1 November 2011 increases or decreases over time. The estimated coefficient ( $\beta_1 = -0.023$ ) is significant at the 1% level, suggesting that employees covered by the new severance pay system have a lower probability of survival than employees under the old system.

One can also test whether employees who signed their contract just after the reform have a higher probability of on-the-job search than those who signed their contract just before the reform. This is done by estimating the following model:

$$S_{it} = \beta_0 + \beta_1 Y_{it} + \sum_{c>2} \beta_c X_{cit} + \varepsilon_{it} \quad (5)$$

Where  $S_{it}$  equals one if an employee engages in on-the-job search (zero otherwise), and  $Y_{it}$  is, as before, a dummy variable equal to one when an employee belongs to the treatment group (zero otherwise). The other explanatory variables remain as in equation (4), and the regression is run on the same restricted sample as before (i.e. individuals who signed their contract over the period September-December 2011).

The estimated coefficient ( $\beta_1=0.045$ ) is positive and significant at the 5% level, indicating that the severance pay reforms have led to relatively higher on-the-job search for those affected by the reform.

### The impact of the severance pay reforms on individual employment survival: Evidence from social security data

The same analysis can be repeated using social security data which contain details on the employment spells of individuals with different employers, the reasons for ending an employment spell, as well as a range of personal characteristics. The time span covered by the data extends from January 2010 to September 2015. More details on the structure and content of these data can be found in Annex D.

As in the previous analysis, a difference-in-difference model is estimated to compare the outcomes of individuals who signed their contract in the two months after the reform (treatment group) to those who signed their contract in the two months before the reform (control group):

$$Y_i = \beta_0 + \beta_1 T_i + \sum_{c>0} \gamma_c X_{ci} + \sum_{c>0} \mu_c Z_{ci} + \varepsilon_{it} \quad (6)$$

Where the treatment dummy,  $T_i$ , equals one for all employment spells  $i$  of the treatment group and zero for the spells of the control group. The regression further controls for individual characteristics,  $X_{ci}$  (age, gender, region, migrant status), and firm level characteristics,  $Z_{ci}$  (sector, and size at the end date of employment). The outcome variable,  $Y_i$ , is defined as the hazard rate of employment, i.e. the probability of leaving a job, given that the individual has been employed in the job for a duration  $d$ .

Given that the dependent variable is expressed as a hazard rate, the regression is estimated using a Cox proportional hazard model. The estimated hazard ratio equals 1.082 (significant at the 5% level), implying that individuals hired in the two months after the reform are 8.2% more likely to leave employment than the individuals hired just before the reform (Table C8).

Table C8. The impact of the severance pay reforms on individual employment survival (*Social Security data*)

	All	Employer initiative	Employee initiative
$\beta_1$	1.082**	1.129***	0.919
	-0.036	-0.043	-0.069
Observations	6168	5389	2473

Note: \*\*\* Significant at the 1% level, \*\* significant at the 5% level, \* significant at the 10% level. Robust standard errors clustered at the firm level.

Source: OECD analysis based on social security data.

The data also contain information on the reason for the end of the employment spell. When the dependent variable in the model is redefined to include exits from employment that occurred on the initiative of the employer only, the estimated hazard ratio increases to 1.129 (significant at the 1% level). On the other hand, when the dependent variable covers only exits that occurred on the initiative of the employee, no significant difference is found between the treatment and control groups. These results suggest that the reason why individuals who signed their contract under the new rules are more likely to separate from their jobs is that they are more likely to get fired.

### **Concluding remarks**

Several conclusions may be drawn from the analysis presented above. First, that the reform appears to have been successful in promoting greater worker re-allocation as well as hiring, particularly among small firms. Second, that the preservation of accumulated severance pay rights for existing workers has mitigated the impact of the reform on their probability of job separation. And, third, that the same grandfathering rules have introduced some inequalities in the labour market depending on when someone signed their contract. Indeed, the analysis showed that individuals hired under the new rules were more likely to separate from their jobs (being fired) than individuals who were still hired under the old rules. These inequalities were primarily a result of the November 2011 reforms, and later reforms tried to reduce these inequalities (or at least the rate at which they would increase) by imposing a cap on the severance pay of existing workers and reducing the rate at which further severance pay entitlements would be accumulated.

## ANNEX D

**THE IMPACT OF REDUCTIONS IN UNEMPLOYMENT BENEFIT LEVELS ON FLOWS  
FROM UNEMPLOYMENT TO EMPLOYMENT: EVIDENCE FROM ADMINISTRATIVE DATA**

The reforms of the Portuguese unemployment benefit system reduced the generosity of benefits for unemployment spells starting after April 1<sup>st</sup> 2012. The reforms entailed: i) a reduction in the maximum amount of unemployment insurance (from 3 to 2.5 times the social support index<sup>187</sup>), and ii) a 10% reduction in the unemployment insurance level after six months of unemployment (i.e. a declining replacement rate). The primary goal of these reforms was to encourage recipients to look more actively for a job and reduce the length of unemployment spells. It is important to note that the reduction in the level of unemployment benefits was only a small part of the total unemployment benefit reform package, and that the biggest effect is to be expected from the reduction in the maximum duration of unemployment insurance. However, because the latter will not apply to the first spell of unemployment after the reform, it is too early to assess its impact on unemployment duration.

This annex analyses the impact of the reduction in unemployment benefit levels on the probability of moving from unemployment to employment using social security data for the period January 2010 to September 2015 (see Box D1 for more details on the data). These data contain detailed monthly information for a sample of labour market participants, such as labour market status, social security benefits and contributions, as well as a range of personal characteristics. To isolate the impact of the reduction in benefit levels from the reduction in unemployment benefit duration, only the first spells of unemployment after the reform are taken into account.<sup>188,189,190</sup>

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187. Since 2009, the social support index (IAS) has been equal to EUR 419.22, which implies that the maximum monthly level of unemployment insurance was lowered from EUR 1 257.66 to EUR 1 048.05.
188. In the dataset made available for the purposes of this report, only 643 unemployment spells could be identified which were covered by the new rules on maximum unemployment benefit duration. These spells represent about 1% of the total monthly observations for unemployed individuals.
189. The reforms also changed the unemployment benefit eligibility rules by lowering the threshold for access from 450 to 360 days of contributions over the past 24 months. This will have changed the composition of both the treatment and control groups. As it is impossible to identify the persons with 360 to 450 days of contributions, the results of the analysis presented in this annex might be contaminated by this increased eligibility. Therefore, a key (but not unreasonable) assumption is that these newly eligible individuals do not have a significantly different outflow probability from individuals who were already eligible under the old rules. Either way, the difference-in-differences setup used in this annex will remove this possible bias – as long as the widened eligibility affected the treatment and control groups in the same way.
190. In the same period, unemployment benefit levels for jobless households were temporarily raised by 10% (although the new maximum benefit level and the 10% reduction after six months would still apply). While these individuals would ideally be excluded from the analysis, the lack of household information in the administrative data makes it difficult to identify them.

**Box D1. Social Security data used for unemployment insurance analysis**

The impact of the unemployment benefit reforms are analysed using a 2% social security sample on all individuals registered with Social Security on December 31<sup>st</sup> 2012. For these individuals, all monthly information between January 2010 and September 2015 is matched on. The information includes:

- Personal characteristics (age, gender and country of birth);
- Information on the employer for employed individuals (firm size and sector);
- Information on remuneration (level and taxes);
- Information on unemployment benefit (start date, type of benefit and level).

On December 31<sup>st</sup> 2012, the sample consists of 61 169 individuals, of whom 11.72% are unemployed. The number of individuals decreases with time as some individuals disappear from the social security system. A total of 11 225 individuals have one or more unemployment spells starting after the reform. About 64% of them have spells longer than six months and are therefore affected by the new declining replacement rate. Only about 4.7% of individuals who become unemployed after the reform are affected by the reduction in the cap (or 534 individuals).

To test the impact of the reduction in the maximum unemployment insurance level, a difference-in-differences model is estimated which compares the difference in outcomes before and after the reform between those who were affected by the cap and those who were not:

$$Y_i = \beta R_i + \gamma T_i + \delta(R_i T_i) + \sum \mu X_i + \varepsilon_i$$

The reform dummy,  $R_i$ , equals one for all unemployment spells starting after April 2012, and zero for all spells starting before. The treatment dummy,  $T_i$ , equals one for all individuals with unemployment benefits at or above 2.5 times the social support index (i.e. for all individuals affected by the reduction in the cap).<sup>191</sup> In order to make the control group ( $T_i=0$ ) as comparable as possible to the treatment group, only those people with unemployment benefits just below the maximum are selected (i.e. with benefits between 90% and 100% of the new cap).<sup>192</sup> The coefficient on the interaction term,  $\delta$ , measures the impact of the reform. It shows whether the difference between the pre- and post- reform outcomes of the treatment group is different from that for the control group. The outcome variable,  $Y_i$ , is defined as the hazard rate (or exit rate) from unemployment, i.e. the probability of moving from unemployment to employment conditional on having been unemployed for a duration  $d$ . The regression further controls for a set of personal characteristics,  $X_i$  (migrant status, age, gender, region and maximum unemployment benefit duration)<sup>193,194</sup>

A similar regression setup is used to test the impact of the 10% reduction in unemployment benefit levels after six months of unemployment. This time, however, the treatment and control groups are constructed on the basis of when the individual became unemployed. To be more precise, the impact of the reform is estimated by comparing individuals who became unemployed just before the reform to those who became unemployed just after, and the regression model becomes:

$$Y_i = \beta R_i + \sum \mu X_i + \varepsilon_i$$

191. The reduction of the maximum amount by 10% after six months (for spells starting after the reform) is taken into account in the definition of the treatment and control groups.

192. Expanding this group to those with benefit levels between 80% and 100% of the cap does not affect the results obtained.

193. All personal characteristics are entered into the regression as dummy variables (two migrant statuses, five age groups, two genders, seven regions, three benefits duration levels).

194. In a robustness check using discrete duration models monthly dummies are added to control for possible seasonality in the hazard rate. Their inclusion does not, however, alter the result.

Where the reform dummy,  $R_i$ , equals one for all individuals whose employment spell started in the two months following the reform (April and May 2012) and zero for the individuals with an unemployment spell starting in the two months before the reform (February and March 2012). To make the treatment and control groups more comparable, they are further limited to having a level of initial unemployment benefits (before the 10% reduction) of between EUR 15 and EUR 34 per day. These levels are chosen as to not include individuals subject to the minimum or maximum benefit level, given that the minimum level hides large difference in previous wage levels and that the maximum was subject to an additional reform. The outcome variable,  $Y_i$ , and the control variables,  $X_i$ , remain as before.

Given that the outcome variable in both models is defined as a hazard rate, the regressions are estimated using a Cox proportional hazard model.<sup>195</sup> Table D1 shows the hazard ratios for the variables of interest for both regressions, as well as the number of unemployment spells per person.<sup>196</sup> The hazard ratio for the maximum level regression is larger than one, which implies that the probability of exiting to employment has increased more after the reform for the treatment group than for the control group. Similarly, the estimated hazard ratio for the 10% reduction model is larger than one, which suggests that the individuals who became unemployed just after the reform have a higher probability of moving to employment than the individuals who became unemployed just before the reform. However, neither of the coefficients are significantly different from one, meaning that no definite conclusions can be drawn about the effect of the reform.<sup>197</sup>

**Table D1. The impact of unemployment benefit level reductions on unemployment outflows: Regression results**

	Maximum level	10% reduction
$R_i T_i$	1.244 (0.215)	
$R_t$		1.115 (0.112)
Number of spells	1385	702

Note: Robust standard errors displayed in parentheses.

Source: OECD analysis based on social security data.

To test the robustness of these results, the models are re-estimated using control groups obtained by propensity score matching. This ensures an even greater degree of comparability between the treatment and control groups. More specifically, each individual from the treatment group is matched to a non-treated individual with similar observable characteristics (based on age, gender, region, migrant status and maximum unemployment benefit duration).<sup>198</sup> For the first model (maximum benefit level), the new

195. A critical assumption of this Cox model is that the difference between the hazard rates of two groups is independent of the unemployment duration. While this assumption is unlikely to be violated in the maximum level regressions, it might be problematic for the 10% reduction given that the difference between the two groups only starts after six months of benefits. However, allowing for a different coefficient before and after six months of unemployment duration did not significantly improve the model. This does not change when anticipation is taken into account (i.e. setting the threshold at four or five months of unemployment duration).
196. The number of spells is very close to the number of individuals, given that there are only few individuals with multiple unemployment spells.
197. The impact of the 10% reduction in benefit level after six months could be greater for individuals with greater liquidity constraints. To test for this, the analysis was re-run separately on two different groups with varying levels of unemployment benefit (one with unemployment benefit ranging between EUR 15 and EUR 20 per day, the other with benefit levels between EUR 20 and EUR 34 per day). The reform did not have a statistically significant impact on the flows from unemployment to employment for either group.
198. Individuals at the minimum or maximum benefit level are excluded from the treatment and control groups.

control group consists of the nearest neighbours of the treated individuals, both before and after the reform.<sup>199</sup> For the second model, all individuals starting their unemployment spell in the two months after the reform are matched to their nearest neighbour in the group of individuals who became unemployed in the two months before the reform.<sup>200,201</sup> Using these new control groups, the same duration models as above are estimated, but standard errors are clustered at the match level. The results in Table D2 confirm the earlier estimates, with both hazard ratios remaining insignificantly different from one. This could be due to small sample sizes, and future research should use larger extracts from the social security data to verify the results obtained here.<sup>202</sup>

**Table D2. The impact of unemployment benefit level reductions on unemployment outflows: Regression results using propensity score matching**

	Maximum level	10% reduction
$R_t \bar{T}_i$	1.071 (0.168)	
$R_t$		1.145 (0.164)
Number of spells	1435	400

Note: Robust standard errors clustered at match level displayed in parenthesis.

Source: OECD analysis based on social security data.

While this preliminary assessment could not detect any significant effect of the unemployment benefit level reforms on unemployment outflows, the benefit reductions will still have had an impact on the government budget. An estimated 4.8% of beneficiaries were affected by the reduction in the cap over the period April 2012 to September 2015, with an average saving in UB of almost EUR 185 per beneficiary per month – resulting in a total saving of around EUR 70 million over the entire period. The saving associated with the 10% reduction was even greater: EUR 200 million over the period April 2012 to September 2015.<sup>203</sup> It is important to note that these estimates only represent a rough approximation of the actual savings from the reforms, as the calculations are based on a 2% random sample of the Social Security records. The calculations therefore assume that the sample is representative of the wider population.

199. The group from which the nearest neighbours for the maximum level treatment group are selected is restricted to individuals with unemployment benefits between 80% and 100% of the maximum benefit level.
200. Both for the maximum level control group, as for the 10% reduction control group, propensity score matching is done using a k-nearest neighbour matching method with  $k = 2$ .
201. While limiting the treatment group to individuals with employment benefit levels between EUR 20 to EUR 34 does not alter the results, the estimated coefficient for the treatment group limited to benefits between EUR 15 and EUR 20 becomes significantly larger than 1 (indicating that the reform may have had an effect on exits from unemployment to unemployment), albeit only at the 10% significance level.
202. As an additional robustness check the models have been re-estimated in a discrete setup (i.e. transforming the data from spells to monthly observations), using both a standard logistic estimator and a proportional hazard model. As expected, the estimated coefficients are very close to the ones reported in tables D1 and D2.
203. Whereas unemployment benefits without the 10% reduction can easily be identified in the social security data from the actual unemployment benefit level, the benefit level in the absence of the new lower cap is more difficult to estimate. Based on the observed wage in the previous job, it is nevertheless possible to calculate approximately what the benefit would have been in the absence of the new cap. Comparing this level to the current cap provides an estimate of the reduction caused by lowering the cap. To estimate an upper bound on the savings from this reform, one can alternatively assume that the saving for each individual affected is simply the difference between the old and the new cap. This leads to a total saving of EUR 79 million.

## ANNEX E

**THE IMPACT OF ACTIVE LABOUR MARKET PROGRAMMES ON EMPLOYMENT  
OUTCOMES: EVIDENCE FROM ADMINISTRATIVE DATA**

The Portuguese public employment service (PES) provides a range of active labour market programmes (ALMPs), such as internships, hiring subsidies and training programmes. As documented in Chapter 1, some of these programmes have been revised substantially over the last few years, and new programmes have been introduced.

In this annex, the impact of a set of ALMPs on individual employment outcomes is analysed using administrative data from the Portuguese PES for the period 2010-2015. These data contain information on the programmes that each unemployed individual registered at the PES participated in. Additionally, registration dates as well as dates and reasons for exit are documented, together with a set of personal characteristics (Box E1).

**Box E1. Public Employment Service data used for the evaluation of ALMPs**

The extract of administrative data from the Portuguese PES used for the present analysis contains information for all individuals who were registered with the PES on December 31st 2011 as well as for all new entrants to the PES until the end of 2014. The dataset therefore contains all registered unemployed over the period 2012-2014, and information for these individuals pre-2012 and post-2014. In total, the dataset contains information on 1 846 393 unemployed individuals.

Information is available on date of registration at the PES, interventions by the PES (e.g. ALMPs), placements, annulments and a range of personal characteristics. An individual leaves the dataset following placement by the PES (12% of exits) or annulment (88%). In total, 44 different reasons for annulment are present in the dataset. These consist of five broad categories: self-placement (27%), refusal of activation measures (26%), absence for controls (30%), leaving the labour market (6%), dropout from intervention (2%), and other (6%).

The PES data contain information on 220 different interventions, varying strongly in number of participants. The most common interventions are “placement interview”, “personal development plan”, and “active job search” – i.e. standard PES services. The programmes evaluated in this report cover around 7% of all registered interventions and 45% of all ALMPs (71% excluding *formação contínua*). Table A shows that Vida Ativa (a short-duration training programme) is by far the largest among the evaluated programmes, while the reported number of participants in the hiring subsidy programme is relatively low. The average age, schooling level and unemployment duration at the start of participation (proxied by the number of months since registration) reflect the eligibility criteria of the different programmes (see Annex A).

**Table A. Characteristics of ALMP participants**

	Number of participants	Average age	Average years of schooling	Average months registered with PES
Subsidised internships	116 834	26.1	14.4	7.3
Hiring subsidies	15 826	33.9	11	13.5
Vida Ativa	564 599	40.2	9.6	12.9
Socially useful work	200 388	42.2	8	11.1

*Note:* Subsidised internships include *Passaportes emprego*, *Estágios profissionais*, *Estágios emprego*; hiring subsidies includes *Estímulo 2012*, *Incentivo à contratação*; socially useful work includes *Contrato emprego-inserção*, *Contrato emprego-inserção+*.

*Source:* OECD analysis based on PES administrative data.

The goal of this analysis is to see whether individuals who participated in an activation programme had a higher probability of being employed, compared to similar individuals who did not participate in the same activation programmes. More specifically, individuals starting a programme at time  $t$  are compared to individuals unemployed at time  $t$ , but who never participated in that programme. The probability of employment for these two types of individuals is compared at times  $t+6$ ,  $t+12$ ,  $t+18$  and  $t+24$ .

To make the control group (i.e. the individuals who did not participate in a specific ALMP) as comparable as possible to the treatment group (i.e. the participants), propensity score matching is used.<sup>204,205</sup> Everyone from the treatment group is matched to a similar person in the control group based on age, gender, marital status, whether or not the individual has children, years of schooling, date of registration with the PES, and whether or not the individual has already been employed. This matching process is done separately for each month in which the ALMPs are started.<sup>206</sup> As it is possible that individuals participate in multiple ALMPs, the analysis is repeated for a treatment group of individuals who only participated in the ALMP of interest and a control group of individuals who did not participate in any ALMP at all.<sup>207</sup>

Given that the matching process is limited to observable characteristics of the individuals, there might still be a significant difference between the treatment and control group in terms of unobservable characteristics, such as motivation and innate ability. These unobservable characteristics might, in turn, affect the outcome of interest and therefore bias the estimates of the impact of the programme. However, given the lack of natural experiment, it is impossible to take these unobserved characteristics into account. That being said, the wide range of observed characteristics included in the matching process should reduce the extent of such bias.

The focus of the analysis is on four different types of ALMPs that are all substantial in terms of number of participants, and were introduced or reformed during the crisis period:

- Subsidised internships (*Passaportes emprego, Estágios profissionais, Estágios emprego*)
- Hiring subsidies (*Estímulo 2012, Incentivo à contratação*)<sup>208</sup>
- Short-duration training programmes (*Vida Ativa*)
- Socially useful work (*Contrato emprego-inserção, Contrato emprego-inserção+*)

More details on these ALMPS can be found in Annex A.

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204. Propensity score matching is done on a one-to-one basis without replacements

205. Another option would have been to run a basic OLS regression of the outcome variable (employment) on a treatment dummy (1 if treated, 0 if control) and individual characteristics. The advantages of PSM are that it is non-parametric, and therefore more flexible, and that it only looks at comparable observations (common support).

206. Individuals starting an internship at time  $t$  can only be matched to individuals who were unemployed at time  $t$ . When an individual is included in the control group for the treatment group with starting date  $t$ , he or she is excluded from potential matching with treatment groups with starting dates  $t' > t$ .

207. The restriction does not apply to some very standard PES interventions, such as information sessions or the personal development plans (*Sessão de informação colectiva, Plano Pessoal de Emprego*)

208. The PES data do not allow the identification of *Estímulo 2013* and *Apoio a contratação via reembolso da TSU* participants.

Table E1 shows the probability of employment after 6, 12, 18 and 24 months for the treatment and control groups, and for the four different types of ALMPs. An individual is considered to be employed when he or she has permanently left the PES database and when the reason for exiting is either placement by the PES or self-placement. Unemployment is defined as being registered in the PES database. The main drawback of these definitions is that they ignore individuals who left the PES dataset for other reasons than (self-)placement. This is because the PES data do not allow the identification of the labour market status of these individuals, and they can therefore not be classified as either employed or unemployed.

Individuals participating in a subsidised internship programme have a higher probability of being employed than comparable individuals not participating, except six months after the start of the programme (Panel A). This latter finding is not surprising, given that the majority of the treated individuals are by definition still unemployed after six months since internship programmes normally last for more than six months. The fact that the employment probabilities of the treatment group after finishing the internship are higher than the probabilities of the control group suggests that participating in an internship has a positive impact on the probability of finding a job (and staying employed) – assuming that there was no selection into the programme based on observable characteristics. This is consistent with the fact that many internships are transformed into normal contracts at the end of the internship programme (42% of all internships starting in 2012-2014).

An even more pronounced difference in employment probabilities is found for the hiring subsidies (Panel B). Because individuals participating in a subsidised job are registered as employed and *Estímulo 2012* subsidies lasted for six months, the employment probability of the treatment group after six months is very high by definition. However, even after ending the subsidised job, the employment probabilities for the treatment group remain substantially higher than for the control group. After two years, those who benefited from a hiring subsidy are still 70% more likely to be in employment than similar individuals who did not.

By contrast, *Vida Ativa* appears to have very little impact on the employment outcomes of participants (Panel C). It is not clear why this is but possibilities include the broad nature of the programme (it covers modular training as well as validation of existing skills), the fact that the intensity of the programme can differ strongly across participants, and also that the programme is modular so that the full effect of the programme may not be captured in the present analysis, but only part of it.<sup>209</sup>

Finally, the employment probabilities of individuals participating in a socially useful work programme are slightly higher after 12 and 18 months than those of similar individuals in the control group. However, there does not seem to be a long-run effect of these programmes, as the employment probabilities of the treatment and control groups are almost equal after 24 months. Compared to the individuals participating in the subsidised internships from Panel A, the individuals participating in a socially useful work programme have a much lower probability of being offered a job by the employer where their socially useful internship was done (only 3.2% of all individuals starting such a programme over the period 2012-2014).

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209. The PES data do not provide detailed information on the exact content of the *Vida Ativa* measures for each individual. The intensity of the programme can, however, be proxied by its duration. When excluding participants who participated in *Vida Ativa* for less than five days, the difference in employment probabilities between the treatment and control groups becomes bigger, but remains limited to 4 percentage points after 24 months.

**Table E1. The impact of unemployment benefit level reductions on unemployment outflows:  
Regression results using propensity score matching**

	All				No other ALMP				
<b>Panel A: Subsidised internships</b>									
	Treatment		Control		Treatment		Control		
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Obs.	Mean	
Employed after 6 months	49 931	6.31%	35 183	25.28%	Employed after 6 months	24 385	5.62%	16 511	24.02%
Employed after 12 months	46 836	46.89%	23 666	43.57%	Employed after 12 months	22 502	45.00%	11 151	38.38%
Employed after 18 months	33 035	75.85%	15 504	57.95%	Employed after 18 months	15 345	70.45%	7 941	49.58%
Employed after 24 months	19 625	82.29%	8 358	66.27%	Employed after 24 months	10 370	75.83%	5 251	53.95%
<b>Panel B: Hiring subsidies</b>									
	Treatment		Control		Treatment		Control		
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Obs.	Mean	
Employed after 6 months	7 385	82.17%	5 496	18.03%	Employed after 6 months	4 118	81.84%	2 316	20.64%
Employed after 12 months	7 058	79.13%	4 804	27.75%	Employed after 12 months	3 934	78.14%	1 971	30.04%
Employed after 18 months	6 807	77.29%	4 256	36.98%	Employed after 18 months	3 811	74.57%	1 758	36.92%
Employed after 24 months	6 461	80.05%	3 710	46.85%	Employed after 24 months	3 611	76.54%	1 544	43.52%
<b>Panel C: Vida Ativa</b>									
	Treatment		Control		Treatment		Control		
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Obs.	Mean	
Employed after 6 months	133 041	30.88%	106 991	28.78%	Employed after 6 months	20 950	39.60%	17 561	32.28%
Employed after 12 months	103 545	46.58%	79 193	45.46%	Employed after 12 months	16 602	49.45%	13 027	45.86%
Employed after 18 months	85 875	62.85% <sup>a</sup>	62 653	62.45% <sup>a</sup>	Employed after 18 months	13 862	63.47% <sup>c</sup>	10 430	62.34% <sup>c</sup>
Employed after 24 months	73 503	75.21%	51 870	77.43%	Employed after 24 months	11 947	73.07% <sup>a</sup>	8 798	73.85% <sup>a</sup>
<b>Panel D: Socially useful work</b>									
	Treatment		Control		Treatment		Control		
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Obs.	Mean	
Employed after 6 months	53 780	24.80% <sup>a</sup>	39 844	25.17% <sup>a</sup>	Employed after 6 months	27 359	26.69% <sup>a</sup>	18 214	26.53% <sup>a</sup>
Employed after 12 months	46 953	45.09%	30 209	39.47%	Employed after 12 months	23 422	43.89%	13 962	36.94%
Employed after 18 months	39 677	61.57%	24 029	54.63%	Employed after 18 months	19 297	59.61%	11 349	49.26%
Employed after 24 months	35 369	69.89%	19 704	67.24%	Employed after 24 months	17 129	64.85%	9 553	57.11%

*Note:* All differences between means are significant at the 1% level, with the exception of (a) insignificant, (b) significant at the 5% level, and (c) significant at the 10% level.

*Source:* OECD analysis based on administrative data from the Portuguese PES.

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**ABSTRACT**

Latin American countries are the only Western countries that are poor and that aren't gaining ground on the United States. This paper evaluates why Latin America has not replicated Western economic success. We find that this failure is primarily due to TFP differences. Latin America's TFP gap is not plausibly accounted for by human capital differences, but rather reflects inefficient production. We argue that competitive barriers are a promising channel for understanding low Latin TFP. We document that Latin America has many more international and domestic competitive barriers than do Western and successful East Asian countries. We also document a number of microeconomic cases in Latin America in which large reductions in competitive barriers increase productivity to Western levels.

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## 1. Introduction

Various short-run crises—exchange rate crises, debt crises, inflation crises, balance-of-payment crises, financial crises—have dominated recent macroeconomic research about Latin America. This literature focuses on the causes of these crises and their short-run impact on macroeconomic fluctuations, taking the trend paths of macroeconomic variables as exogenous. Systematic analyses of Latin American macroeconomic trends have received much less attention.<sup>1</sup> This paper presents a comparative analysis of Latin American macroeconomic trends over the last 50 years using a neoclassical growth framework.

We first compare long-run Latin American macroeconomic performance to that in a number of other countries to provide a benchmark for what Latin America could have reasonably achieved. We make two sets of comparisons. We compare Latin America's long-run performance to that in a peer group of other Western market economies—the other countries with a large fraction of citizens of Western European descent. This comparison shows that *all* Western countries—including those with initial income levels reasonably similar to those in Latin America in 1950—have made substantial progress in catching up to the United States. In sharp contrast, no Latin American country has made any significant progress in catching up to the United States. We also compare Latin America to a number of East Asian countries that had initial income levels equal to or lower than those in Latin America in 1950. These countries also have had substantial catch-up. These comparisons motivate the question we address: Why can't Latin America catch up to its Western peer countries and to the successful East Asian countries?

To gain a better understanding of Latin America's stagnation, we decompose per capita GDP for Latin America and the other countries into two components: output per worker and employment as a fraction of the adult population. This comparison shows that Latin America's stagnation is primarily the consequence of a labor productivity failure; Latin American labor productivity has failed to gain any ground on U.S. labor productivity over the last 50 years. In contrast, the development successes of all the other countries are largely the consequence of labor productivity successes; labor productivity in all of these other countries is catching up to U.S. labor productivity. Understanding Latin America's relative stagnation

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<sup>1</sup>Elias (1992) is an exception.

requires understanding its relative productivity stagnation.

We report two main findings. First, we find that stagnant relative total factor productivity (TFP) is the key determinant of Latin America's relative income and labor productivity stagnation. Second, we find that a human capital difference is not the key determinant of Latin America's TFP gap, but that barriers to competition are a promising factor. We draw this latter conclusion because both the breadth and depth of Latin American competitive barriers far exceed those in the Western countries or in East Asia, and because there are a number of microeconomic cases in Latin America in which large changes in the size of competitive barriers are systematically followed by large productivity changes. In particular, big increases in barriers to competition are followed by large productivity decreases, and big decreases in these barriers are followed by large productivity increases.

The paper is organized as follows. Section 2 develops a neoclassical model for organizing our investigation. Section 3 compares Latin America's output to that in Europe and East Asia. Section 4 decomposes Latin American output into its labor productivity and employment components and investigates the source of low Latin American labor productivity. Section 5 quantifies how much of Latin America's TFP gap can be accounted for by human capital. Section 6 discusses theoretical models in which competitive barriers lead to low productivity. Section 7 documents that Latin America has erected a number of domestic and international barriers to competition that significantly exceed competitive barriers in either Europe or East Asia. Section 8 presents a number of empirical microeconomic cases that document how government policies that limit competition have significantly reduced TFP in some Latin American countries. Section 9 concludes.

## 2. A Neoclassical Framework

We use the neoclassical growth model to guide our analysis. In this closed economy model, there is a representative household for country  $i$  with the following objective function:

$$\max E_0 \sum \beta_i^t \{u_i(C_{it}, L_{it})\},$$

where  $\beta_i$  is the discount factor for country  $i$ ,  $u_i$  is the preference for consumption and labor in country  $i$  in period  $t$ ,  $C_{it}$  is consumption, and  $L_{it}$  is labor supply. The population is denoted

by  $N_{it}$  and is normalized to be one in period 0. The population of country  $i$  grows at the constant rate of  $n_i$  :

$$N_{it} = (1 + n_i)^t.$$

A constant returns to scale Cobb-Douglas technology produces output for consumption and investment:

$$A_{it}K_{it}^\theta L_{it}^{1-\theta} \geq C_{it} + X_{it},$$

where  $A_{it}$  is TFP,  $K_{it}$  is capital services,  $L_{it}$  is labor services, and  $X_{it}$  is investment. The law of motion for capital is given by

$$K_{it+1} = X_{it} + (1 - \delta)K_{it}, \quad K_{i0} \text{ given.}$$

The process  $A_{it}$  is the product of two components, as in Parente and Prescott (2004):

$$A_{it} = \eta_{it}A_t, \quad 0 < \eta_{it} \leq 1,$$

where  $A_t$  is the world technology frontier and  $\eta_{it}$  is the relative efficiency of country  $i$  in using that technology. For our empirical analysis, we will assume that U.S. TFP is a reasonable proxy for the world technology frontier, which implies that  $\eta_{US} = 1$ . For our purposes, the process generating  $A_t$  is unimportant, though at certain points we will find it convenient to assume that it grows at the constant rate  $\gamma$ . The relative efficiency term  $\eta$  is a key component in our model. For present purposes, we treat this as a parameter.

This simple model generates long-run income differences between countries through two channels: (1) through the relative efficiency term  $\eta$  and (2) through differences in the relative supplies of capital and labor, which in our model are governed by country-specific preference differences. Note that any factor that affects income in the long-run—such as tax distortions—will manifest itself as a change in either one or both of these two channels.<sup>2</sup> We

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<sup>2</sup>For example, capital income tax differences would show up as a difference in the relative discount factor,

will first use this model to gauge how important these two channels are for understanding Latin American macroeconomic development. We will then evaluate the deeper factors that lie behind the differences in efficiency or relative employment of the factors of production in Latin America.

### 3. Latin America's Persistent Economic Stagnation

This section examines Latin America's long-run macroeconomic performance, which we measure as per capita income relative to that of the world frontier (U.S. per capita income). Interpreting the income gap between Latin America and the United States requires a *benchmark* that lets us assess how large of a gap should be expected today, and how much this gap should have changed over the last 50 years.

We construct an empirical benchmark for assessing Latin American development. We do this by forming a set of peer group countries for Latin America and by measuring the income gaps in the peer group relative to the United States over the last 50 years. We treat the income gaps between the peer group and the United States as a benchmark for interpreting the income gap between Latin America and the United States.

The peer group is the countries that we assume are similar to Latin America in their ability to adopt and learn new technologies and that are similar in their preferences for market goods. In terms of the language of our model, this means we are looking for countries that have the ability to achieve similar levels of  $\eta_i$  and that have similar  $\beta_i$  and  $u_i(C_i, L_i)$ . Because Latin America is significantly populated by individuals of European descent, we define the peer group to be the other Western countries: the Western/Northern/Southern European nations, plus the countries that have been significantly populated by Europeans and in which European religion, language, and culture have been dominantly established.<sup>3</sup>

Our organizing view for this peer group is that since the Europeans who populated these regions established Western religion, language, and culture, then it should have been feasible for them to replicate the successful economies of the West. More specifically, this

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and labor income tax differences would show up as a difference in the relative preference for leisure.

<sup>3</sup>The peer group is Belgium, Canada, the United Kingdom, Spain, Portugal, Greece, France, Denmark, Sweden, Norway, Finland, Netherlands, Italy, Australia, Austria, Switzerland, New Zealand, Ireland, Iceland, Greenland, Germany, and the United States.

commonality leads us to assume that Latin America and the other Western countries should have the same innate ability to learn and adopt successful Western technologies, and that with similar cultures, they should have similar preferences for market goods.

Our assumption that similar cultures have similar preferences for market goods follows in part from Cole, Mailath, and Postlewaite (1992), who established a formal connection between culture and preference orderings. In their framework, cultural differences between countries can lead to differences in nonmarket rewards for market activities. There are self-enforcing social arrangements in their model in which nonmarket goods are allocated on the basis of wealth or income. This implies reduced form differences in preference orderings over market goods according to cultural differences and suggests a presumption that countries with similar cultures will have similar preferences for market goods.

By comparing Latin America to these peer countries, we will interpret income differences between Latin America and the peer group as idiosyncratic Latin American choices that differentially affect either the efficiency of production or the employment of the factors of production or both. We will use the term “policy choices” to broadly refer to these idiosyncratic Latin American effects.

Table 1 shows ethnic, language, and religion characteristics for Latin America’s population.<sup>4</sup> The table shows that Latin America is a Western region by these characteristics—Latin America experienced substantial European immigration and widely adopted European languages and religion. Regarding culture, a number of scholars argue that Western culture has had a substantial impact on Latin America and, in some cases, nearly wiped out native cultures. (See Hoogvelt 2001 and the references therein.)

Figure 1 shows per capita income for Latin America and the other Western countries. Income is measured as a percentage of U.S. real GDP per capita (Maddison 2001). The figure shows that the Latin American countries are the poorest Western countries. In particular, note that Western European emigrants were able to transform the regions that became Canada, the United States, Australia, and New Zealand into rich countries. In contrast, Latin America was unable to replicate this Western success. The average Latin American

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<sup>4</sup>We include the major Latin American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Paraguay, Peru, Mexico, and Uruguay.

income is just 22 percent of U.S. income, compared to an average of 69 percent for the other Western countries.

We next assess how these relative income gaps have either narrowed or widened over time. Figure 2 shows per capita income between 1950 and 2000 for the population-weighted average of the Latin American countries and for the population-weighted average of the other Western countries that had similar income levels to Latin America in 1950. The figure shows that all the other poor Western countries have had significant catch-up over the last 50 years. The average European country in this group increased from 40 percent of U.S. income in 1950 to 67 percent in 2000. In contrast, Latin America lost ground, falling from 28 percent of the U.S. level in 1950 to 22 percent in 2000.

The figure also shows relative per capita income for some East Asian countries with initial income levels similar to or below the Latin American level in 1950. The data show that economic success can also be achieved by non-Western countries, and that Latin America is also significantly underperforming this group. The population-weighted average Asian country increased from 16 percent of U.S. income in 1950 to 57 percent in 2000. Latin America's underperformance relative to Asia is significant, because Latin America—as a Western country—should have had an advantage over Asia in copying and adopting the successful Western technologies and practices that made the West rich.<sup>5</sup>

Table 2 shows the average relative incomes for these three groups, and Figures 3–5 show relative incomes for each of the individual countries in the three groups over the 1950–2000 period. Figure 5 shows that not a single Latin American country has had any significant catch-up. The Latin American income gaps are just as wide, and for some countries wider, today as they were in 1950.

Perhaps the most striking feature of these data is the constancy of Latin America's relative stagnation. This “relative gap” measure of Latin American macroeconomic performance paints a different picture than that suggested by the more commonly used measure of GDP growth. In particular, the two measures tell a different story about post-1950 Latin

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<sup>5</sup>We chose those European and East Asian countries that had 60 percent or less of the U.S. per capita income level and increased their relative positions by at least 10 percentage points by 2001. The European countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Norway, Portugal, and Spain. The Asian countries are Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan, and Thailand.

American performance. Latin America did have higher growth before 1980 than after. However, according to our preferred relative gap measure, there is no significant Latin American catch-up during the pre-debt crisis period (1950–80), because the U.S. economy grew faster during the earlier period as well. Output was 28 percent of the U.S. level in 1950 and 30 percent in 1980. There was, however, substantial catch-up in the other regions. The European countries rose from 40 percent of U.S. per capita income to 70 percent of U.S. per capita income, and the Asian countries rose from 16 percent of U.S. per capita income to 46 percent of U.S. per capita income over the 1950–79 period. Thus, while Latin America was treading water in the 1950s, 1960s, and 1970s relative to the United States, the rest of these countries were moving rapidly ahead.<sup>6</sup>

These data show that Latin America’s long-standing stagnation is not the consequence of adverse shocks occurring in the post-debt crisis period. How long have these stagnation factors been in place? Maddison’s (2001) data suggest they may have persisted over the last century. Table 3 shows relative Latin American income in 1900, 1950, 1980, and 2001. These data show that Latin America’s stagnation has been the norm for the last 100 years. Latin American per capita income was 29 percent in 1900, almost exactly where it was in 1950 and slightly above where it was in 2001.<sup>7</sup> For the 10 countries that we have data for over this earlier period, per-adult income in 5 of these countries has remained roughly unchanged relative to the United States. Argentina and Chile lost substantial ground relative to the United States during this period. Argentinian income fell from 67 percent of the U.S. level in 1900 to 52 percent by 1950, and Chilean income fell from 48 percent to 40 percent of the U.S. level by 1950. Venezuela was the only country that gained ground, rising from 20 percent of the U.S. level in 1900 to 78 percent by 1950. This impressive gain (which was in part due to Venezuela’s oil exports), however, was largely lost after 1950, as Venezuela returned to 30 percent of U.S. income by 2001.

It is also possible to make even longer-run relative income comparisons, though mea-

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<sup>6</sup>This pre-debt crisis stagnation also emerges in 11 of the 13 individual Latin American countries (except Mexico and Brazil). Hopenhayn and Neumeyer (2004) have recently argued that stagnation and then collapse more accurately describes the last 50 years for Latin America.

<sup>7</sup>We have data back to 1900 for all of our Latin American countries except Costa Rica, Boliva, and Paraguay, and these countries are small enough not to have substantially affected this average.

surement issues become more problematic. These data suggest an even longer period of stagnation or decline. Specifically, Sokoloff and Engerman (2000) estimate that Argentina was richer than the United States in 1800 and that Brazil, Chile, Mexico, and Peru had smaller relative income gaps in 1800 than they do today.

Latin America's relative stagnation is particularly puzzling when compared to the two other major stagnant regions—Africa and the Middle East. Like Latin America, neither of these two regions has gained ground on the United States in the last 50 years, but Africa and the Middle East are plagued by large, idiosyncratic development impediments, including AIDS (Africa), substantial civil conflict, ethnic cleansing, and repressive, nondemocratic institutions. Latin America has not been affected by these problems nearly as much as either Africa or the Middle East. Viewed in this light, Latin America is perhaps the most puzzling regional development failure of the last 50 years.<sup>8</sup>

#### 4. TFP Is the Cause of Latin America's Stagnation

We evaluate Latin America's stagnant relative income by decomposing output per adult ( $Y/N$ ) into two components: output per worker ( $Y/L$ ) and the number of workers relative to the adult population ( $L/N$ ):

$$\frac{Y}{N} = \frac{Y}{L} \frac{L}{N}.$$

This decomposition shows that Latin America's stagnation is the consequence of either low worker efficiency ( $Y/L$ ) or low employment ( $L/N$ ). Table 4 shows that employment is not the key factor accounting for Latin America's stagnation. Latin America's employment rate is on average about 70 percent as high as in Europe and in the United States. This gap is significant, but is clearly not large enough to account for the fact that Latin America has only 25 percent of U.S. per capita income.<sup>9</sup>

This finding implies that productivity is the key factor. Figure 6 establishes this by showing labor productivity for Latin America, Europe, and Asia between 1950 and 2000.

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<sup>8</sup>Barro's (1991) finding that a Latin American dummy variable in his growth regression exerts a larger negative effect than the African dummy variable is consistent with this view.

<sup>9</sup>Interesting studies of this labor supply gap include Heckman and Pages (2003) and Caballero et al. (2004).

These productivity data are measured relative to the U.S. productivity level. These data show that the primary reason behind the output catch-up in Europe and Asia is that labor productivity in these countries is catching up to the U.S. level. The figure also shows that Latin America's stagnation is because of stagnant productivity. In particular, Latin American productivity was 33 percent of the U.S. level in 1950 and 32 percent of the U.S. level in 1998. In contrast, European productivity rose from 39 percent of the U.S. level to 79 percent of the U.S. level in 1998, and Asian productivity rose from 15 percent of the U.S. level to 54 percent of the U.S. level over the same period.

This section investigates Latin American labor productivity by decomposing productivity into two pieces: physical capital per worker and the efficiency of production (TFP). We then evaluate the relative contribution of each of these components to Latin America's labor productivity gap. The relative size of these two factors is important for understanding why Latin American productivity is not catching up. If TFP is the dominant factor, then we should be formulating explanations for why production efficiency is so much lower in Latin America than in the United States. Alternatively, if low capital per worker is the dominant factor, then we should be formulating explanations for why capital formation is so much lower in Latin America than in the United States.

The Cobb-Douglas production function in our model yields the following expression for labor productivity:

$$(1) \quad \frac{Y_{it}}{L_{it}} = A_{it} \left( \frac{K_{it}}{L_{it}} \right)^\theta .$$

Latin America's relative labor productivity gap is thus determined by its TFP gap and its capital-labor ratio gap:

$$\frac{\left( \frac{Y_t}{L_t} \right)^{Latin}}{\left( \frac{Y_t}{L_t} \right)^{US}} = \frac{\left[ \eta_t A_t \left( \frac{K_t}{L_t} \right)^\theta \right]^{Latin}}{\left[ A_t \left( \frac{K_t}{L_t} \right)^\theta \right]^{US}} = \frac{1}{3} .$$

Before proceeding, note that TFP contributes to changes in labor productivity in two ways. There is a direct effect, as TFP shifts the production function, and an indirect effect,

as TFP impacts the capital-labor ratio. This latter impact is observed in the Euler equation that governs capital accumulation. Rewriting this equation yields

$$\frac{K_{t+1}}{L_{t+1}} = \left( \frac{(1 + \gamma)(1 + n)/\beta \frac{u_{ct}}{u_{ct+1}} - (1 - \delta)}{\theta \eta A} \right)^{1/(\theta-1)},$$

where  $\gamma$  is the growth rate of frontier TFP,  $n$  is the population growth rate,  $u_c$  is the marginal utility of detrended consumption,  $\beta$  is the household's discount factor,  $\eta A$  is TFP, and  $\delta$  is the depreciation rate of capital. This shows that the capital-labor ratio is affected by the level of TFP, by parameter values, and by transitional dynamics associated with changes in the intertemporal marginal rate of substitution. The productivity decomposition between TFP and capital per worker thus needs to account for both the direct and the indirect contribution of TFP to labor productivity.

The first step in this decomposition is obtaining capital stock measures. Table 5 shows decade averages of the capital-to-output ratio for Europe, Asia, and Latin America relative to the United States. The data are from Nehru and Dhareshwar (1993). The table shows that Latin America's ratio has been roughly within 10 percent of the U.S. ratio since the 1960s. Asia is the only group in which there is evidence of a significant capital deficiency during the last 50 years. Asia's capital-output ratio was only 36 percent of the U.S. level in the 1950s, but increased to the U.S. level by the 1980s. These data suggest that a capital shortfall is not the major factor retarding Latin America's productivity.

We supplement these capital stock data with capital investment flow data from the World Bank (2002). These investment data also indicate that Latin America has about the same capital-output ratio as the United States. Table 6 shows the ratio of investment to GDP for the United States, Europe, and Latin America. The key point is that Latin America's investment share has been roughly constant and is also about the same as the U.S. investment share. The near constancy of these investment shares also suggests that both the United States and Latin America have been near their respective steady state growth paths. This steady state evidence implies the following relationship between investment and

the capital stock for both Latin America and the United States:

$$\left(\frac{I}{Y}\right) \approx (\delta + n + \gamma) \left(\frac{K}{Y}\right).$$

Moreover, since the investment shares are about the same for both regions, we have

$$(\delta + n + \gamma)^{Latin} \left(\frac{K}{Y}\right)^{Latin} \approx (\delta + n + \gamma)^{US} \left(\frac{K}{Y}\right)^{US}.$$

This expression implies that the capital-output ratios are about the same in the two regions, because the sum of these parameter values is about the same for the two regions. This is because the growth rate of frontier productivity is the same. The population growth rate in Latin America is slightly higher than in the United States, but Latin America probably has a slightly lower depreciation rate, since the fraction of its capital stock accounted for by rapidly depreciating information processing equipment is probably smaller than in the United States.<sup>10</sup>

The three observations that (1) Latin America and the United States have roughly the same capital-output ratios, (2) Latin American output per capita is about one-fourth of U.S. output per capita, and (3) Latin American employment per capita is about three-fourths of U.S. employment per capita mean that the Latin American capital-labor ratio is one-third of the U.S. level. This implies that Latin American TFP is about one-half of the U.S. TFP level.

We estimate that Latin America's 50 percent TFP gap accounts for virtually all of its labor productivity gap. The 50 percent TFP gap directly accounts for about two-thirds of the labor productivity gap, and we will next show that the indirect effect of TFP accounts for about the remaining one-third.

To see this, we make use of the fact that Latin America has been near its steady state growth path over the last 50 years, along with our assumption that the values for the parameters  $\gamma$ ,  $n$ ,  $\delta$ ,  $\theta$ , and  $\beta$  are the same in the two regions.<sup>11</sup> The steady state Euler equation

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<sup>10</sup>The Latin American population growth rate is about 1.7 percent per year, compared to the U.S. population growth rate. See [http://www.overpopulation.com/faq/basic\\_information/population\\_growth\\_rate/latin\\_america.html](http://www.overpopulation.com/faq/basic_information/population_growth_rate/latin_america.html).

<sup>11</sup>Recall from above that the values of the parameters  $\gamma$ ,  $n$ , and  $\delta$  are about the same. Regarding  $\theta$ , Gollin

implies that the Latin American capital-labor ratio gap is entirely accounted for by its 50 percent TFP gap:

$$(2) \quad \frac{\left(\frac{K}{L}\right)^{Latin}}{\left(\frac{K}{L}\right)^{US}} \approx \eta^{1/(\theta-1)} = 0.36.$$

TFP is the efficiency with which an economy uses its capital and labor services. The following sections evaluate some possible factors that might account for Latin America's TFP gap, including human capital and barriers to competition. We will focus our empirical evaluation on whether these factors can account for Latin America's 50-year relative TFP stagnation.

## 5. Human Capital Is Not a Major Factor

Our analysis has measured labor services as employment, without any adjustment for differences in human capital between regions. This suggests that differences in measured TFP across countries may in part be due to differences in human capital. It is important to know how much of Latin America's TFP stagnation is due to human capital, because optimal government policies, and how fast they impact the economy, may likely depend on how much of Latin America's TFP gap is due to human capital.

If human capital differences are the main stagnation factor, then we should observe Latin America's relative human capital stagnating and human capital in the European and Asian countries rapidly catching up to the United States. Moreover, a human capital-based explanation makes two other empirical predictions: (1) Latin America should have a very low ratio of human capital to output compared to the United States, and (2) Latin American TFP levels should be similar to those in the United States after adjusting TFP for human capital differences between the two regions. We will show that neither of these predictions is consistent with the data.

Regarding TFP as a stagnation factor, Table 7 shows relative human capital levels in

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(2002) shows that income shares are quite similar across countries once uniform accounting procedures are used to allocate entrepreneurial income. We assume that differences in  $\beta$  are small, because otherwise the rate of return to physical capital in Latin America would systematically be much higher than in the United States. We are unaware of evidence supporting this view.

1960 and 1990 for Latin America and the other regions using Bils and Klenow's (2000) human capital measures. The patterns in this table don't account for the very different patterns in output per worker over time between Latin America and the other regions, because human capital in *all* the regions is catching up to the U.S. level, and Latin America's increased the most. Specifically, Latin America's relative human capital increased by 19 percent between 1960 and 1990, Europe's increased by 12 percent, and Asia's increased by 9 percent. These changes suggest Latin America should have had the fastest catch-up of the three regions. This prediction stands in sharp contrast to the actual patterns of development.

The Bils-Klenow data suggest that human capital is not the factor that distinguishes the development successes in Europe and Asia from Latin America's stagnation. The fact that Latin America's relative output continues to decline, despite this significant increase in human capital, indicates that a different factor is driving down Latin American relative TFP and output. Moreover, the fact that Europe and Asia have gained 30 and 40 percentage points, respectively, on the United States, despite only about 10 percentage point catch-ups in human capital, suggests that another factor is driving these successful countries.

This conclusion is robust to measuring human capital using average years of schooling. For example, the relative years of schooling in the population aged 25 and older in Latin America rose from 36 percent of the U.S. level in 1960 to 41 percent in 1990. During the same period, Europe's relative educational attainment fell from 69 percent of the U.S. level in 1960 to 63 percent in 1990, while our Asian countries rose from 62 percent in 1960 to 67 percent in 1990. As with the Bils-Klenow data, these changes do not account for why Europe and Asia are development successes, and why Latin America has stagnated.

Country-level schooling measures also support this view, because some Latin American countries have a higher average schooling attainment than many of the Asian and southern European development successes. In Argentina, Chile, and Uruguay, for example, the average years of schooling of the population aged 25 and over was 7.8, 6.2, and 6.7, respectively, in 1990, which exceed the average number of years of schooling of 3.6 years in Portugal, 6.3 years in Spain, and 5.5 years in Singapore. Despite more years of schooling, income in these Latin American countries is much lower than income in these other countries. Output per adult as a fraction of U.S. income in Argentina, Chile, and Uruguay was 29 percent, 36 percent, and

27 percent, respectively, in 2001, while relative per capita income in Portugal, Spain, and Singapore was 51 percent, 56 percent, and 75 percent, respectively.

A second reason that human capital is not the key factor is Latin America's relative ratio of human capital to output. Specifically, if human capital were the key factor, then Latin America should have a relatively low ratio of human capital to output, just as if physical capital were a major factor behind Latin America's low labor productivity, then Latin America should have a relatively low ratio of physical capital to output. In contrast, Latin America has a very high relative supply of human capital. In particular, the Bils-Klenow data imply that Latin America's human capital-output ratio is 140 percent higher than that in the United States. For comparison, we note that Europe's ratio is about the same as the U.S. ratio.

A third reason that human capital is not the central factor accounting for Latin America's TFP gap is because a large gap between the United States and Latin America remains after adjusting for human capital differences. Klenow and Rodriguez-Clare (1997) and Hall and Jones (1999) construct income level accounting in a single year for the countries in the Penn World tables, including Latin America. Hall and Jones (1999) find an average TFP level in our set of Latin American countries of 58 percent of the U.S. level in 1988, after adjusting for human capital. Klenow and Rodriguez-Clare, using 1985 data and some different procedures, find that these countries have an average of 67 percent of U.S. TFP. Averaging these two single-year TFP gaps suggests that human capital accounts for only about a quarter of the 50 percent postwar average Latin American TFP gap we calculated in the preceding section.

We conclude that human capital is not the major factor in explaining Latin America's TFP gap, nor does it appear to play an important role in Latin America's long-run stagnation. This is because while Latin American human capital is increasing over time, its labor productivity is falling. Our view that there is an alternative factor retarding Latin American development is similar to conclusions about the role of human capital in the development process reached by a number of other authors, including Prescott (1998), Easterly (2001), Parente and Prescott (2000, 2004), and Hendricks (2002). We consider this other factor to be inefficient production, either through the failure to adopt superior technologies, or through

the inefficient use of technologies. A key implication of this inefficient production view of low TFP—as opposed to the human capital view—is that productivity and output can rise quickly in response to higher efficiency. We will later see in a number of industry studies that this is indeed the case.

## 6. Latin American Stagnation and Competitive Barriers

A very old view, extending back to at least Adam Smith, argues that barriers to competition will discourage innovation. According to this view, countries that have more competitive barriers will be poorer. We will argue empirically that barriers to competition are at least part of the reason Latin American producers are systematically and persistently less efficient than U.S., European, and Asian producers.

Before conducting this analysis, we note that this channel between competition and productivity is one of the leading channels for understanding low productivity in the theoretical TFP literature. A number of economists are now developing formal models that generate low productivity as an outcome of competitive barriers. A key challenge in these models is to rationalize why societies choose to be unproductive. A major rationalizing element in these models is that a subset of society would be harmed by the adoption of superior technologies, and this subset has sufficient resources to successfully block their adoption. For example, Holmes and Schmitz (1995) present a model in which groups in an industry have the potential to block a new technology by political lobbying for new regulations. The group has skills tied to an old technology that will become obsolete if the new technology is adopted. The group decides whether to use its resources to block or to learn the new technology. The paper shows that the group is much less likely to block if the industry is subject to competition from other countries. Other papers that have developed models in which groups may choose to block technology adoption include Parente and Prescott (1994, 1999), Holmes and Schmitz (2001), Cozzi and Palacios (2003), Bridgman, Livshits, and MacGee (2004), and Herrendorf and Teixeira (2004).

In all of these papers, lowering competition reduces productivity through the channel of “X-inefficiency,” in which an organization fails to produce at its minimum cost. However, there are other channels through which low competition can lead to low efficiency. For exam-

ple, the government may impede entry by more efficient firms in order to protect incumbent, low efficiency producers who politically support the government. This view is consistent with that of Sokoloff and Engerman (2000), who argue that the political elite are the leading groups in Latin America that restrict competition. In the next section we establish that Latin America erects significantly more competitive barriers than the successful countries in Europe and Asia. We will then show that changes in the degree of competitive barriers in Latin America have large and systematic effects on productivity.

## 7. Latin America Puts Up Significant Competitive Barriers

We now focus on government policies that restrict competition. We do this because of our view that policy is central for sustaining persistent competitive barriers. We will examine a number of different types of barriers that we categorize as either *international competitive barriers*, including tariffs, quotas, multiple exchange rate systems, and regulatory barriers to foreign producers, and *domestic competitive barriers*, including entry barriers, inefficient financial systems, and large, subsidized state-owned enterprises.

We will present evidence that shows that Latin America has constructed many international and domestic barriers that have closed off Latin America from both internal and external competition. Both the *breadth* and *depth* of Latin American barriers significantly exceed those in Europe and other successful countries. The breadth and depth of Latin American barriers are important, because the impact of competitive barriers rises nonlinearly with the number of barriers that are adopted. More specifically, competitive barriers are complements. For example, we will show that Latin America has regulations that significantly raise domestic entry costs. Moreover, we will show that Latin America also has had high tariffs, which protect Latin American producers from foreign competition. By insulating domestic producers from foreign competition, tariffs are a complementary noncompetitive factor that raises the noncompetitive effects of high domestic entry costs. Our documentation of Latin American barriers is consistent with Sokoloff and Engerman's (2000) overall view that politically connected groups in Latin America restrict competition.

### **A. Latin America's International Barriers: High Protectionism**

Latin America has a long history of erecting international competitive barriers to protect domestic industries that date back to at least the late 1800s. (See Clemens and Williamson 2002 and Haber (forthcoming).) These barriers include quotas, multiple exchange rate systems, and, in particular, high tariffs.

We now present historical data on these barriers. Before we proceed, it is important to recognize that measuring the effective level of competitive barriers is difficult, not only because of the complementary interactive effects of multiple barriers discussed above, but also because of other measurement problems. For example, some tariff measures are the average of tariff revenue over the value of imports. This does not measure the extent of effective protection since the overall cost advantage secured by domestic producers from the tariff barrier is enhanced by tariffs on their product but lowered by tariffs on their inputs. Similarly, quota measures are typically the fraction of goods subject to a quota, but this fraction does not measure the extent to which the quota is distortionary.

Clemens and Williamson show that Latin American tariff rates were systematically higher than those in other parts of the world as far back as the 19th century. They report that Latin America had average tariff levels of 27 percent between 1870 and 1913, compared to an average level of 7 percent in Asia over the same period. Latin America's tariff rates rose substantially in the 20th century, particularly after World War II. There are large differences in the pattern of tariffs between Latin America and Europe during the post-World War II period that are consistent with Europe's rapid catch-up to the United States and that are also consistent with Latin America's stagnation.

Between 1950 and 1980, Europe gained about 30 percentage points on the United States. Tariffs in European countries were low. This "golden age" of catch-up bypassed Latin America, however, which gained only 2 percentage points on the United States during this period. In contrast to those in Europe, Latin American tariffs were high. Table 8, reproduced from Taylor (1996), shows that Latin American tariffs were systematically and substantially higher than those in Europe during this period. The table shows Taylor's estimates for nominal protection for a number of Latin American countries and for the average of the European Economic Community. The table shows that Latin American tariffs are almost

always much higher than the EEC tariff across all categories of goods: consumer durables, consumer nondurables, semimanufactured goods, raw materials, and capital goods.

The EEC protection rates range between 1 percent and 13 percent, and the unweighted average tariff rate for the EEC countries is about 10 percent. In contrast, the unweighted average rate for five of the six Latin American countries ranges from 68 percent to 172 percent. Protection rates are particularly high on consumer goods, including rates of 176 percent in Argentina, 260 percent in Brazil, 328 percent in Chile, 247 percent in Colombia, and 114 percent in Mexico on nondurables. Protection rates are also surprisingly high on capital goods, including rates of 98 percent in Argentina, 85 percent in Brazil, and 45 percent in Chile. We view these rates as surprisingly high, because optimal tax theory in a number of models predicts that capital accumulation decisions should not be distorted in the long run. This theoretical conclusion implies that capital goods imports should not be subject to tariffs.

In addition to these high tariffs, Latin American countries also made significant use of quotas during this period. For example, Haber (forthcoming, p. 50) reports that the number of imported goods subject to quotas rose from 28 percent in 1956 to 74 percent by 1974.

Relatively high protectionism in Latin America persisted until the early 1990s. Loayza and Palacios (1997) show that average tariff rates in Latin America were about 38 percent between 1984 and 1987, compared to 16 percent for East Asia. Between 1988 and 1992, Latin American tariffs averaged 27 percent, compared to 15 percent in East Asia. By the mid-1990s, the two regions had roughly similar tariff rates. These authors also show that high nontariff protectionism also persisted until the mid-1990s.

Latin America's high protection levels should have closed off the region to competition and reduced international trade. We will next show that our development success countries in Europe and Asia tend to be much more open than Latin America. We define openness as the trade share, which is the sum of imports and exports divided by GDP. Following Eaton and Kortum (2002) and Alvarez and Lucas (2004), we plot the log of the trade share against the log of GDP. The idea here is that countries that are small—those that have small total GDPs—trade more than countries that have very large total GDPs. Figures 7–10 show these plots for the 1960s, 1970s, 1980s, and 1990s. Both the GDP and trade share data are decadal

averages, where  $\overline{TS}_{it}$  is the decadal average trade share for country  $i$  and  $\overline{GDP}_{it}$  is the decadal average GDP for country  $i$ . The figures also include a regression line for the cross-section of countries from the following regression that is estimated individually for each decade:

$$\overline{TS}_{it} = \alpha_0 + \alpha_1 \overline{GDP}_{it} + \varepsilon_{it}.$$

The figures systematically show that most of the Latin America countries are below the regression line, meaning they are less open than predicted by the statistical relationship, and most of the European and Asian countries are above the regression line, meaning they are more open than predicted by the statistical relationship. This means that the development success stories are persistently and systematically more open than the Latin American development failures.

This finding stands in contrast to the openness-growth literature, in which there is no clear-cut empirical relationship between these two variables.<sup>12</sup> The Holmes and Schmitz (1995) model provides two explanations for why there is a systematic relationship for our Latin American countries, but no systematic relationship in the openness-growth literature. This is because (1) the impact of openness depends critically on the level of domestic competitive barriers, and (2) the relationship between openness and productivity *levels* may be quite different from the relationship between openness and productivity *growth*.

Regarding the first explanation, lack of openness in the Holmes-Schmitz model is important only if a country also has high domestic competitive barriers. The next section documents that Latin America satisfies these criteria. The second reason is that there is an important connection between openness and productivity *levels* in the Holmes-Schmitz model, but not necessarily between *productivity growth* and openness. In the language of our model, this means openness can affect the level of  $\eta$  in a country, and this permanent change in  $\eta$  would be associated with temporarily higher growth associated with transitional capital accumulation dynamics. Our Latin American countries are therefore interesting because they have had low productivity, low openness, and high domestic barriers in each of the decades we

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<sup>12</sup>See Rodriguez and Rodrik (2001) for a survey of this literature and Rigobon and Rodrik (2004) for a very recent analysis that finds a small positive relationship between openness and growth.

consider. These are precisely the countries in which openness should matter for productivity growth, even if the productivity growth is just a temporary transition to a new level.

## **B. Latin America’s Domestic Competitive Barriers: High Entry Barriers**

Latin America has systematically higher domestic competitive barriers than the European and Asian successes, including (i) high entry costs, (ii) poorly functioning capital markets, and (iii) high costs of adjusting the workforce or building up an experienced workforce. Entry costs can be an important competitive barrier because they reduce the incentive for firms to enter an industry. Djankov et al. (2002) present data on the costs of starting businesses for 85 countries. The data are from 1997. They estimate the entry cost by summing the individual costs of all the requirements for establishing a “representative” business in the formal sector, including the opportunity cost of the entrepreneur’s time, and the direct pecuniary cost of these requirements, such as filing fees and license fees.

Table 9 shows the total entry costs for Europe, Asia, and Latin America. The estimates show that the United States has the lowest entry costs and that Latin America has the highest entry costs. In particular, the total cost of entry is 80 percent of per capita GDP in Latin America, compared to just 1.7 percent in the United States. These data suggest that entry costs are indeed much higher in Latin America, and constitute a potentially important competitive barrier.

Poorly functioning capital markets that impede the capital accumulation of new entrants or smaller firms—and prevent them from competing with larger more established, and often more politically connected, firms—are a potentially important barrier to competition, particularly if entry costs are high and entrepreneurs are liquidity constrained. The extent of government ownership of banks is regarded as an important indicator of how bank lending is preferentially directed to politically connected enterprises. Table 10 shows that Latin America’s government ownership share is higher than the European countries’, and much higher than in our Asian countries or in the United States, where this share is zero. These data are from La Porta, Lopez-de-Silanes, and Shleifer (2002).

Latin America also has adopted labor market regulations that impede the ability of firms to acquire the efficient level and composition of their workforce. In summarizing the

results of a collection of studies on Latin American and Caribbean (LAC) labor markets, Heckman and Pages (2003) conclude that while the overall costs of labor market regulation are quite similar in LAC and OECD countries, the LAC countries impose these costs much more in the form of job security measures than in social security provisions. Heckman and Pages conclude that the higher LAC job security costs “likely impair productivity and adaptation to new technology ...” (p. 38). In Table 11 we show one key aspect of the higher Latin American job security costs. That table documents that Latin America imposes much higher dismissal costs (measured in terms of months of the worker’s wage) than Europe or Asia, or the United States where these costs are zero. High costs associated with reallocating workers from less productive to more productive enterprises could constitute an important barrier to competition. Davis and Haltiwanger (1992) have documented the large extent of this worker reallocation in the United States. Hopenhayn and Rogerson (1993) have shown in a quantitative-theoretic model that costly worker reallocation can have significant effects.

This section has examined a number of competitive barriers in Latin America, Europe, East Asia, and the United States. In every case, Latin America has the highest barriers. Given the complementary interactive effects between these barriers, we conclude that Latin America has much higher protection rates for their producers than Europe, East Asia, or the United States.

## 8. Microeconomic Evidence on the Impact of Competition

We now present microeconomic evidence from Latin America that shows how productivity and output change when there is a change in competition. Before proceeding, we note that a number of studies have documented that lack of competition and low productivity go hand-in-hand. (See McKinsey Global Institute 1994 and IMD 2004.) For example, the McKinsey studies show that productivity is high when firms face international competition. Baily and Solow (2001) review the McKinsey evidence and interpret this correlation between competition and productivity as one in which competition drives productivity:

“An implication [of the McKinsey finding] is that some part of observed productivity disadvantages reflects organizational slack or an unwillingness to change and innovate. This corresponds to the belief, expressed by managers, that when

pressed by competition they can ‘take some of the cost out of the product.’”

However, Baily and Solow acknowledge that the correlation is open to an alternative interpretation: more productive industries choose to compete globally. The possibility of different interpretations of this barrier-productivity correlation is much less of an issue when the approach of Galdon and Schmitz (2002) and Schmitz (2004) is used. They conduct industry-level analyses in which there is a large, exogenous change in competition, and in which productivity is easy to measure both before and after the competitive change. For example, Schmitz (2004) finds that when Minnesota iron ore producers faced increased foreign competition brought about by exogenous changes in the world steel market, their work practices (the rules that governed employee tasks) changed to achieve a 100 percent increase in labor productivity.

We follow this approach here by presenting industry cases in which there are large and exogenous government policy changes that significantly affect the level of competition. Some of these cases will show what happens when anti-competitive policies are adopted. We first present two cases that show the adoption of nationalization policies that destroy competition by eliminating international firms from an industry are associated with large and permanent productivity and output losses. We then present five cases that show the adoption of policies that foster competition are associated with large productivity and output gains. The pro-competitive policies include the privatization of state-owned enterprises, the elimination of trade impediments, such as quotas, and the elimination of restrictions on the entry of international firms.

We will show that the different policy changes affect two types of competitive barriers. We call the first type of barrier *entry impediments*, which keep high productivity firms out of an industry. We call the second type of barrier *incentive impediments*, which reduce the incentives for firms within an industry to be efficient.

### **A. Eliminating Competition in the Venezuelan Oil Industry**

We now provide an important case where nationalization eliminated foreign competition and reduced productivity substantially in a major sector. Our discussion draws on recent work by Restuccia and Schmitz (2004). Before World War II, Venezuela had substan-

tial foreign investment in its oil industry. This policy changed with the election of the *Accion Democratica* (AD) party in 1945. The party pushed for greater Venezuelan sovereignty in the industry, culminating in decisions in the late 1950s to terminate international rights to extract oil beyond 1983. This meant a *de facto* nationalization of the industry at that date. Not surprisingly, this policy change led to a decline in foreign investment in the industry. This declining investment then led the AD party to nationalize the industry earlier. The nationalization of the Venezuelan oil industry was completed on January 1, 1976. Although industry officials fought to retain foreign managers after the nationalization, the government preferred to sever all international ties and largely succeeded in driving out most of the industry's foreign experts.

Figure 11 shows output and labor productivity in the Venezuelan oil industry before and after nationalization. Before 1970, output and productivity rose considerably, growing at rates of about 4.5 percent and 7.5 percent, respectively. Output and productivity began to decline after 1970 and fell sharply just before the nationalization. By the time of the nationalization in the mid-1970s, productivity had returned to its 1964 level and output had returned to its 1957 level.

Output and productivity continued to fall after the nationalization. By 1985 productivity had fallen over 70 percent from its 1970 peak, and was at its 1955 level. Output fell 53 percent between its peak in 1970 and 1985, and was also at its 1955 level. It is striking that the large output loss was accompanied by an increase in employment, which suggests that the local managers were not nearly as efficient at running the operation as the foreign managers. Moreover, this output loss is not the result of OPEC policies; many OPEC members increased their output considerably in the 1970s and 1980s, which stands in sharp contrast to Venezuela's production during this period. Output and productivity recovered modestly after the 1985 trough, but remained well below their peak levels. By 1995, which is the ending year for our data, output had returned only to its 1963 level, and productivity had returned only to its 1960 level.

We conclude that nationalization of the Venezuelan oil industry, which eliminated the efficient international management of the industry, led to large productivity and output losses. Restuccia and Schmitz argue that a significant fraction of this productivity loss was

due to the loss of international expertise.

## **B. Eliminating Competition in the Venezuelan Iron Industry**

Restuccia and Schmitz (2004) also show that Venezuela followed a similar nationalization policy with its iron ore industry, with similar results. Figure 12 shows output and labor productivity in the Venezuelan iron ore industry before and after nationalization. The output and productivity patterns mirror those from the oil industry. Both output and productivity rose significantly until just before nationalization, with output growing at 6.1 percent per year and productivity growing at 11.5 percent per year from 1953 to 1974. Both output and productivity fell 50 percent between 1974, which is just before the nationalization, and 1976, which is the first year after nationalization. By 1983, output was 62 percent below its 1974 peak level and productivity was 58 percent below its peak level. As in the case of oil, output and productivity recovered modestly, but remained well below their pre-nationalization peaks. By 1995, both output and productivity were 30 percent below their 1974 levels.

We now turn our attention to the impact of policy changes that increase competition.

## **C. Allowing Entry in Chile's Copper Industry**

We first show that bringing foreign competition to Chile's copper industry is associated with a large and permanent increase in productivity and output. We will show that Chile's policy change, which reversed its 1971 nationalization of the industry, reduced both entry and incentive impediments.<sup>13</sup>

Copper is a major Chilean industry, accounting for about one-third of exports and about 10 percent of GDP. In 1971, the largest Chilean copper mines, accounting for about 85 percent of production, were nationalized and subsequently operated by a government-owned firm, Codelco. Ten percent of Codelco's revenues were paid directly to the military. The remaining output was produced by small, privately owned mines. The key outcome of the nationalization is that Codelco faced very little foreign or domestic competition. Despite some reforms by Pinochet to encourage foreign investment in the 1980s, there was very little

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<sup>13</sup>The material in this section draws from Aydin and Tilton (2000), Garcia, Knights, and Tilton (2000, 2001), and Tilton (2002). We thank John Tilton for providing us with his data.

foreign entry, and Codelco maintained its very high market share.<sup>14</sup>

In 1990, the Pinochet government was replaced by a civilian government that was committed to supporting reforms, and at about the same time, copper prices rose. This led to a substantial increase in foreign entry. Figures 13 and 14 show how output, productivity, and Codelco's industry share changed with the introduction of foreign competition. Total copper output increased 175 percent between 1990 and 2000, which is a growth rate of over 11 percent, compared to a growth rate of about 4.5 percent between 1970 and 1990. Much of this output increase came from entrants, as Codelco's output share dropped from 75 percent in 1990 to 33 percent by 1999. Figure 14 shows that productivity increased substantially after the introduction of foreign competition. Productivity increased by a factor of more than 3.5 over the 1990s, which is a growth rate of 14 percent per year, compared to a growth rate of 3.5 percent per year before 1990. Garcia, Knights, and Tilton (2001) show that about 30 percent of the productivity gain was from higher efficiency at individual mines, while 70 percent of the gain was from shifting location, that is, from the production of new entrants. The fact that productivity grew faster than output indicates that the industry was able to produce more output with fewer workers.

Figure 15 shows that Chile's rapid post-reform productivity growth significantly reduced the labor productivity gap between Chile and the United States. Before the reform, Chile's relative productivity deteriorated from 41 percent of the U.S. level to about 30 percent of the U.S. level. After the reforms, Chilean productivity increased from 30 percent of the U.S. level to 82 percent of the U.S. level over a 10-year period.

The figure also shows that U.S. productivity was roughly unchanged for five years before the reforms and for five more years after the reforms. This fact suggests there were no frontier technological breakthroughs, which provides further evidence that competitive reforms were the main cause of Chile's large productivity catch-up. This suggests that the new, private entrants increased productivity by (1) mining better deposits, (2) using a superior technology (that was available before 1990), or (3) having better expertise. The important

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<sup>14</sup>The Constitutional Mining Law, adopted in 1982, ostensibly provided foreign investors protection in the event of future confiscations, but the law came under attack by the political opposition. Perhaps not surprisingly, there was very little new foreign investment in the industry.

point is that all of these factors were available to Latin America before the reform. The competitive reforms also led to a productivity increase at Codelco, which owned and operated four large mines. Between 1990 and 1997, productivity rose by 37, 70, 70, and 84 percent at these mines. These large productivity gains suggest that the nationalization policy also dulled the incentives for incumbent producers to be efficient. Despite Codelco's productivity gains, there was a significant reallocation of production from Codelco to the most efficient producers. This large loss of market share suggests that Codelco may not have survived in any form had it not been able to realize these efficiency gains after the industry reforms.

We conclude that pro-competition policy reforms that encouraged foreign competition significantly increased productivity in the Chilean copper mining industry by allowing high productivity producers to enter and by changing the incentives facing the incumbent producers. In particular, this case shows that even large and persistent productivity gaps in quantitatively important sectors can be eliminated quickly when policy fosters competition.

#### **D. Reversing Quotas in Brazil's Computer Industry**

We now show how eliminating a zero quota policy in Brazil's computer industry is associated with a large increase in output and productivity. We will show that lifting the import ban on foreign-produced computers reduced both entry and incentive impediments in the industry. Our discussion draws on work by Luzio and Greenstein (1995) and Botelho et al. (1999).

In 1977, Brazil embarked on a "market-reserve" policy for its personal computer and minicomputer producers. This meant that only PCs and minicomputers produced by Brazilian-owned firms could be legally sold in Brazil.<sup>15</sup> While there undoubtedly were illegal purchases of imports by small firms and individuals, Luzio and Greenstein document that the black market was not a practical choice for large firms. The policy thus insulated Brazilian computer producers from foreign competition, and the policy also featured entry barriers to new firms through a maze of bureaucratic requirements. The policy also provided protection for upstream component producers through domestic content laws that required Brazilian computer makers to use domestically produced components, including silicon chips, picture

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<sup>15</sup>There were some provisions for production by local firms in joint venture with foreign firms.

tubes, and other standard parts. The prices of these Brazilian components were two to five times higher than international prices. The policies also restricted entry into the component supply industries. (See Luzio and Greenstein 1995, p. 624.)

Under the quota policy, the Brazilian computer producers were not competitive with international producers. Brazilian computer prices were 70 to 100 percent above international prices after the policy was adopted. Support for this policy evaporated, and after the 1990 presidential election, President Collor phased out this market-reserve policy by 1992. The new policy eliminated the quota, included tariffs of about 30 percent, and provided some tax incentives for foreign firms to produce PCs in Brazil (Botelho et al. 1999, pp. 9–10). The abandonment of the zero quota policy coincided with large price declines, large output increases, and large productivity increases. Computer prices fell 43 percent per year from 1990 to 1992, compared to an 18 percent annual decline before Collor’s election. Moreover, prices fell substantially immediately after Collor’s election.

Luzio and Greenstein use these price declines to infer productivity changes in Brazil’s computer industry. They estimate that Brazil had a 6-year relative technological gap to the United States in 1989. That is, the efficiency of Brazil’s producers in 1989 was equivalent to U.S. producers in 1983. Since productivity growth in the U.S. computer industry has been estimated to be around 30 percent per year,<sup>16</sup> this means that Brazil had only about 20 percent of the U.S. productivity level in 1989 prior to the reforms. Brazil was able to eliminate one-third of its productivity gap, however, between 1990 and 1992. This is striking, given the very rapid productivity advancements occurring in the United States.

The policy reform also is associated with a large increase in domestic production. From 1992 to 1998, output increased by about 100 percent, compared to just a 33 percent increase from 1985 to 1992.<sup>17</sup> (See Botelho et al. 1999, Fig. 1.) This post-1992 output increase is probably understated because the sales figures are measured in dollars, and prices were falling much faster after 1992 than during the 1985–92 period.

Imports rose 150 percent with the new policy, but despite this increase in foreign

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<sup>16</sup>Source: <http://www.bls.gov/opub/ted/2000/Dec/wk1/art02.htm>.

<sup>17</sup>The figures we have for local production are for computer hardware, which includes PCs, minicomputers, mainframes, and peripherals. Foreign mainframe production was allowed in Brazil before 1992.

competition, many of the Brazilian firms were able to successfully compete. Following the policy change, 6 of the top 10 producers were Brazilian firms. We conclude from this case that increasing competition led to large productivity and output advances. The fact that Brazilian firms raised productivity substantially and quickly after the removal of the quota policy suggests that the quota policy retarded the incentives for firms to be efficient.

### **E. Privatizing State-Owned Enterprises: Brazilian Iron Ore**

We next analyze the privatization of the Brazilian iron ore industry. Our discussion draws on the work of Schmitz and Teixeira (2004). We will show that the privatization of this industry removed both entry and incentive impediments and substantially raised productivity.

Brazilian iron ore was historically produced by both state-owned enterprises and private firms. In 1990, SOEs accounted for about 60 percent of production and private firms about 40 percent. The state-owned portion of the industry was composed of two firms: CSN (Cia. Siderurgica Nacional) and CVRD (Companhia Vale do Rio Doce). Almost all of the SOEs' production was accounted for by CVRD, which at that time was the largest iron ore producer in the world. CSN was primarily a steel producer and owned only one small iron ore mine. Privatization began in 1991 when CSN sold its small mine to private investors. Plans to sell CVRD also began in the early 1990s, and this led CVRD to change its organization structure in preparation for privatization.

One of the key organizational changes was in the rules that governed the allocation of tasks across employees. Prior to privatization, work rules placed significant limitations on the number of tasks a worker could perform. Specifically, workers had specialized job classifications that permitted them to perform only a very small set of tasks. For example, machine operators were prohibited from making any adjustments or repairs to their machines, even though some of these repairs were trivial. Schmitz and Teixeira argue that this work rule policy depressed productivity through similar channels as in Schmitz' (2004) study of the U.S.-Canadian iron ore industry.

These work rule restrictions were removed when CVRD prepared for privatization in the early 1990s. Schmitz and Teixeira (2004) report that interviews with company and union officials indicate that the threat of privatization weakened the union, which led to the changes

in work rules. The privatization of CVRD was completed in 1997 when it was purchased by local entrepreneurs.

Figure 16 shows output and productivity in the industry between 1971 and 1997. Note that there was almost no productivity growth between 1973 and 1990. Productivity begins to grow at the onset of privatization, culminating in a 30 percent increase in 1997 when the privatization of CVRD is completed. Productivity grew about 140 percent between 1990 and 1997, and output grew about 30 percent during this period. As in the case of the Chilean copper industry, the Brazilian iron ore industry produced more output with significantly fewer workers following the policy reform.

Figure 17 decomposes overall industry productivity into the productivity at CVRD's northern and southern operations and the productivity of the private producers.<sup>18</sup> Productivity at both of the CVRD divisions began growing in 1993, and productivity in the private mines began growing in 1995. The productivity at all three sets of plants grew between 110 and 130 percent between 1990 and 1998. The increase in CVRD's productivity is the result of removing the entry impediments in the industry, as a more efficient group of managers operated the mines following the privatization. The increase in productivity at the incumbent private mines is the result of removing efficiency impediments in the industry, as these mines had to compete with a more efficient CVRD.

We conclude from this case that privatizing the industry led to large productivity gains both at the newly privatized firms and at the firms that had to compete with the privatized firms.

## **F. The Large-Scale Privatization of Mexican SOEs**

We now explore larger-scale Latin American privatizations. We begin with Mexico's privatization of most of its SOEs, which began in 1983. Our discussion draws on work by La Porta and Lopez-de-Silanes (1999). We will present data that show privatization of state-owned businesses is associated with large output and productivity gains.

Prior to the early 1980s, state-owned enterprises (SOEs) played a significant role in the Mexican economy. They accounted for about 14 percent of GDP and about 38 percent

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<sup>18</sup>Data are available only beginning in 1986.

of capital investment. These state-owned enterprises operated in a wide range of industries in manufacturing, mining, and services. Within manufacturing, these enterprises included producers in textiles, chemicals, heavy machinery and equipment, electronics, autos, and transport equipment.

These enterprises, however, were very inefficient. They received transfers and subsidies totaling 13 percent of GDP, which means they were just barely positive value-added organizations. After 1983, almost all of these enterprises were sold to private bidders. La Porta and Lopez-de-Silanes (1999) analyze the impact of this privatization process by studying the pre- and post-privatization performance of 170 Mexican state-owned enterprises in 49 industries. The privatizations occurred over the 1983–91 period. They find that output and productivity rise substantially following privatization. Mean real sales rise 54 percent, and median real sales rise 68 percent. What is even more striking is that these large output increases occur despite large labor reductions. Figure 1 in their paper shows that the average employment level of these enterprises fell by more than half after privatization.

Other performance measures also improve substantially after privatization. Tax collections from these enterprises rise from  $-4.6$  percent of pre-privatization sales to 8.4 percent of post-privatization sales. The median ratio of operating income to sales rises from  $-2$  percent before privatization to 9 percent afterward, and the median ratio of net income to sales rises from  $-13$  percent to 7 percent. Both of these post-privatization profitability ratios are comparable to those of publicly traded, private firms in Mexico, and nearly 60 percent of these increases in income are accounted for by higher productivity.

Since the reforms occur during a period of rapid economic growth in Mexico, the authors also compare post-privatization performance of the SOEs with the performance of incumbent private firms. This comparison also shows that the recently privatized firms had much larger output and productivity gains than the incumbent private firms. It is worth nothing that La Porta and Lopez-de-Silanes did not try to account for the impact of privatization on the performance of the private incumbent firms, or the broader impact of the policy change on the aggregate economy. Analyzing these indirect effects would have led to even higher estimates of the effects of the privatization reforms.

We conclude that the privatizations led to large increases in productivity and output

for a significant fraction of the economy by removing entry impediments. As in the case of the Chilean copper industry and the Brazilian iron ore industry, output expanded substantially with significantly fewer workers.

### **G. The Large-Scale Privatization of Argentinian SOEs**

Argentina also privatized many of its SOEs in the 1990s. Galiani et al. (2001) study the privatization of these state enterprises. In contrast to Mexico, most Argentinian state-owned enterprises were large vertically integrated “natural” monopolies (e.g., electricity, transport, and communications). When the government sold the enterprises, it often kept the monopoly structure in the industry to make the firm attractive to prospective buyers. Hence, the productivity consequences of privatization might not have been as large under this strategy.

Galiani et al. use a method very similar to that used by La Porta and Lopez-de-Silanes (1999) in their study of Mexican privatizations. Even though many transferred enterprises continued to operate as a monopoly (albeit a private one), large performance gains resulted. The increases were not as large as in the more competitive Mexican cases, but were still significant. They find a median increase in labor productivity of 46 percent. They also find unit costs declined 10 percent and production rose 25 percent.

There is a common theme in these seven cases: policy changes that substantially affect the amount of competition faced by Latin American producers significantly and systematically change productivity. In particular, these cases suggest that Latin America indeed can achieve Western productivity levels when competitive barriers are removed.

## **9. Conclusion**

Latin America is a development outlier. This is because it is the only group of Western countries that are not already rich, or that have not gained significant ground on U.S. income levels in the last 50 years. In contrast, Latin America is falling further behind the United States and the other economic successes. Latin America is a development failure because its TFP has failed to catch up. Our analysis suggests that its TFP stagnation is not due to a human capital stagnation, but is rather due to idiosyncratic and long-standing Latin American choices that have impeded either the adoption of superior technologies or the most efficient use of technologies.

We have argued that competitive barriers are a promising route for understanding Latin America's large and persistent productivity gap. This is because Latin America systematically sets up significantly more impediments to competition than the United States, Europe, or East Asia, and these impediments are associated with low productivity. Specifically, we found that Latin American policy changes that eliminated competition are associated with large and permanent declines in productivity and output, and conversely that Latin American policy changes that increased competition are associated with large increases in productivity and output in a set of industries.

The key implication of our findings is that Western-level productivity success is indeed feasible for these Latin American producers. In particular, when competitive barriers are eliminated and Latin American producers face significant foreign competition, they are able to replicate the high productivity levels of other Western countries. The key open question is whether increasing competition in other Latin American industries would also lead to such large productivity and output gains. More work is needed to address this question, but if the answer is yes, then understanding the reasons Latin America has set up so many competitive barriers is central. Potentially interesting avenues for addressing this latter question may include high inequality, as documented by Sokoloff and Engerman's (2000) and Acemoglu et al.'s (2004) general arguments about institutional design.

We hope that these findings stimulate further work on the importance of competitive barriers in Latin America. A number of other industries could be analyzed using this approach, including the privatization of the steel industry. We also hope that this stimulates work on identifying and evaluating other possible stagnation candidates. Our findings also have implications for these other factors. In particular, they suggest that any candidate factor must satisfy two criteria: (1) it must work through TFP, and (2) it needs to have been in place for at least the last 50 years. Candidate explanations that do not have these two characteristics are not likely to be the major culprits.

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**Table 1. Percentage of Latin American Population  
of Western Descent, Language and Religion**

	Descent*	Language**	Religion***
Argentina	97	99	96
Bolivia	45	61	95
Brazil	93	95	80
Chile	95	97	100
Colombia	92	94	90
Costa Rica	94	99	92
Ecuador	65	82	95
Mexico	69	98	95
Paraguay	95	59	90
Peru	52	80	90
Uruguay	96	98	69
Venezuela	89	99	98
Average†	84	94	89

\*Descent: the fraction of the population that is white or mixed-white. Data are from Gall (2004).

\*\*Language: the fraction of the population that speaks a Western European language. (These fractions are likely understated, because they do not count individuals who did not have formal education, but who may still speak one of these languages.) Data sources are: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Uruguay, and Venezuela: ethnologue.com (the total number of people speaking a Western-European language) and Maddison 2001 (total population); Bolivia: the share of Spanish speakers in the total population (age 6 or higher), 2001 Census, Instituto Nacional de Estadística (INE); Mexico: the share of Spanish-speakers in the total population (age 5 or higher), Instituto Nacional de Estadística, Geografía e Informática (INEGI); Paraguay: the fraction of the population that speaks Spanish, Portuguese, English, German, Italian, or French, 1992 Census, Dirección General de Estadísticas, Encuestas y Censos (DGEEC); Peru: the share of the population whose native tongue is Spanish (age 5 or higher), 1993 Census, Instituto Nacional de Estadística e Informática (INEI).

\*\*\*Religion: the fraction of the population affiliated with Western religions, that is, Christianity and Judaism. Data are from CIA (2004).

†Averages were obtained using 2003 population weights (CIA 2004).

**Table 2. GDP per Capita Relative to the U.S.**  
(Regional Averages for Selected Countries)

Year	Europe	Asia	Latin America
1950	0.40	0.16	0.28
1980	0.70	0.46	0.30
2001	0.67	0.55	0.22

**Table 3. Latin American  
GDP per Capita Relative to the U.S.**

Year	1900	1950	1980	2001
Argentina	0.67	0.52	0.44	0.29
Bolivia	-	0.20	0.14	0.09
Brazil	0.17	0.17	0.28	0.20
Chile	0.48	0.40	0.31	0.36
Colombia	0.24	0.23	0.23	0.18
Costa Rica	-	0.21	0.26	0.22
Equador	-	0.19	0.22	0.14
Mexico	0.33	0.25	0.34	0.25
Paraguay	0.25	0.18	0.18	0.11
Peru	0.20	0.24	0.23	0.13
Uruguay	0.54	0.49	0.35	0.27
Venezuela	0.20	0.78	0.55	0.30
Average*	0.29	0.28	0.31	0.22

\*The average is computed using all of the available data in each year and is population weighted.

**Table 4. Employment Rates by Region**  
(Regional Averages for Selected Countries)

Year	Europe	Asia	Latin America	U.S.
1950	0.43	0.41	0.34	.40
1973	0.42	0.44	0.31	.41
1998	0.41	0.49	0.35	.48

**Table 5. Capital-to-Output Ratios by Decade Average**  
Relative to the U.S.\*

	1950s	1960s	1970s	1980s
Europe	0.79	0.91	1.03	1.12
Asia	0.36	0.51	0.77	0.98
Latin America	0.83	0.88	0.89	1.07

**Table 6. Investment-to-Output Ratios by Region**  
(Regional Averages for Selected Countries)

Year	Europe	Asia	Latin America	U.S.
1960s	0.32	0.33	0.21	0.19
1970s	0.26	0.34	0.24	0.20
1980s	0.22	0.30	0.21	.0.20
1990s	0.21	30	0.21	0.18

**Table 7. Bils-Klenow Relative Human Capital Levels**  
(Regional Averages for Selected Countries, U.S. = 100)

	1960	1990
Latin America	46	55
Europe	65	73
Asia	66	73

\*King and Levine (1994) also construct capital-to-output series for a wide variety of countries. The implications of their data for the relative value of the ratio for Latin America is quite similar to Nehru and Dhareshwar's (1993).

**Table 8. Nominal Rates of Protection in 1960**  
**Latin America and the EEC**

Country	Nondurables	Durables	Semi-Mfg.	Raw Materials	Capital Goods	Average
Argentina	176%	266%	95%	55%	98%	138%
Brazil	260%	328%	80%	106%	84%	172%
Chile	328%	90%	98%	111%	45%	134%
Colombia	247%	108%	28%	57%	18%	92%
Mexico	114%	147%	28%	38%	14%	68%
Uruguay	23%	24%	23%	14%	27%	22%
EEC	17%	19%	7%	1%	13%	11%

**Table 9. Business Start-up Costs**  
 Fraction of per Capita GDP

Region	United States	Europe	Asia	Latin America
Total	1.7	36	24	80

**Table 10. Government Ownership Share of the Top 10 Banks**

Regions	United States	Europe	Asia	Latin America
1970	0	64%	26%	75%
1990	0	40%	21%	47%

**Table 11. Mandated Severance Pay**  
 (In Terms of Months of Wages)

Region	United States	Europe	Asia	Latin America
Indemnity Pay	0	1.1	1.5	2.7

Figure 1: GDP Per Capita Ranking

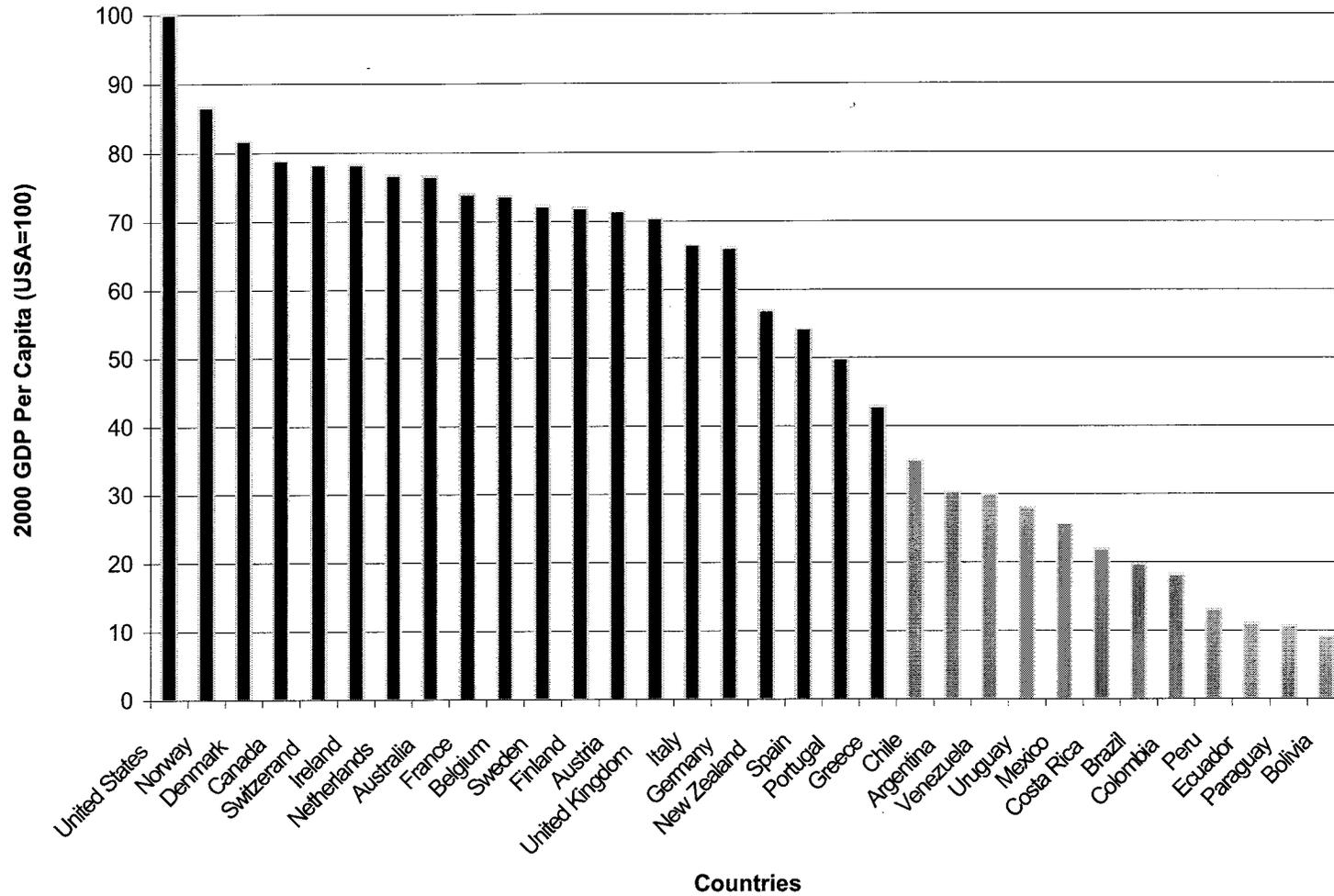


Figure 2: Regional GDP Per Capita Relative to US

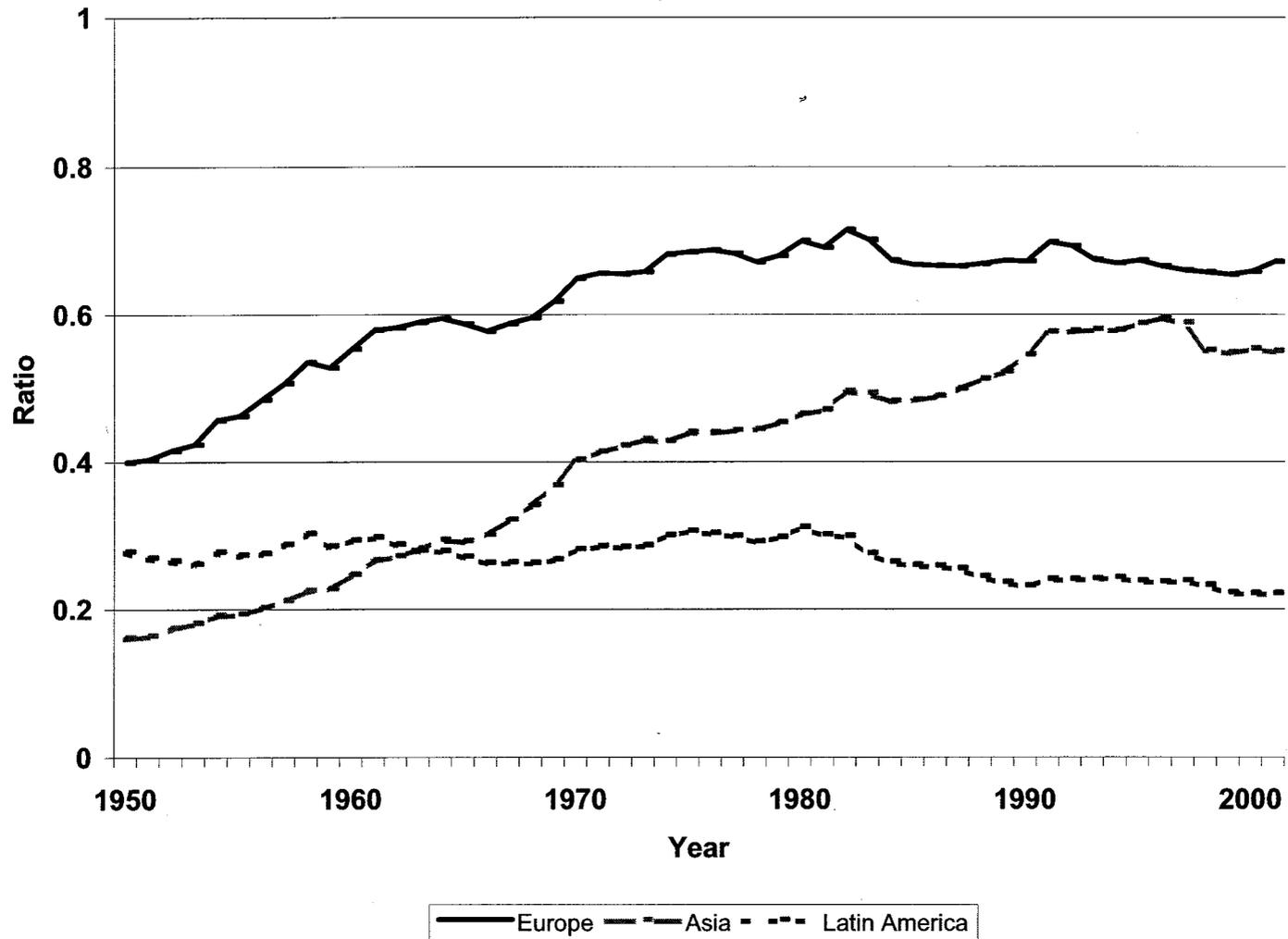


Figure 3: European GDP Per Capita Relative to US

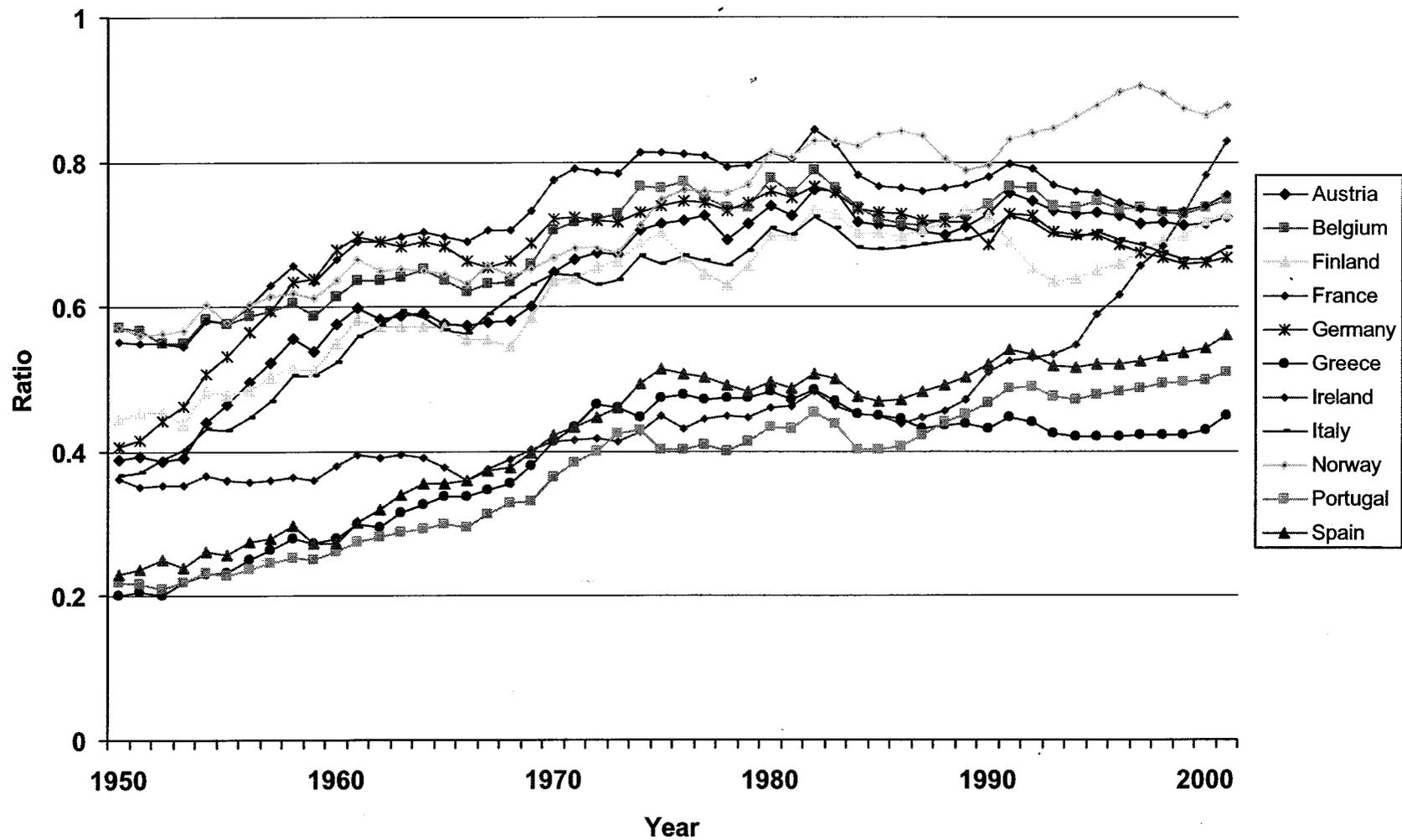


Figure 4: Asian GDP Per Capita Relative to US

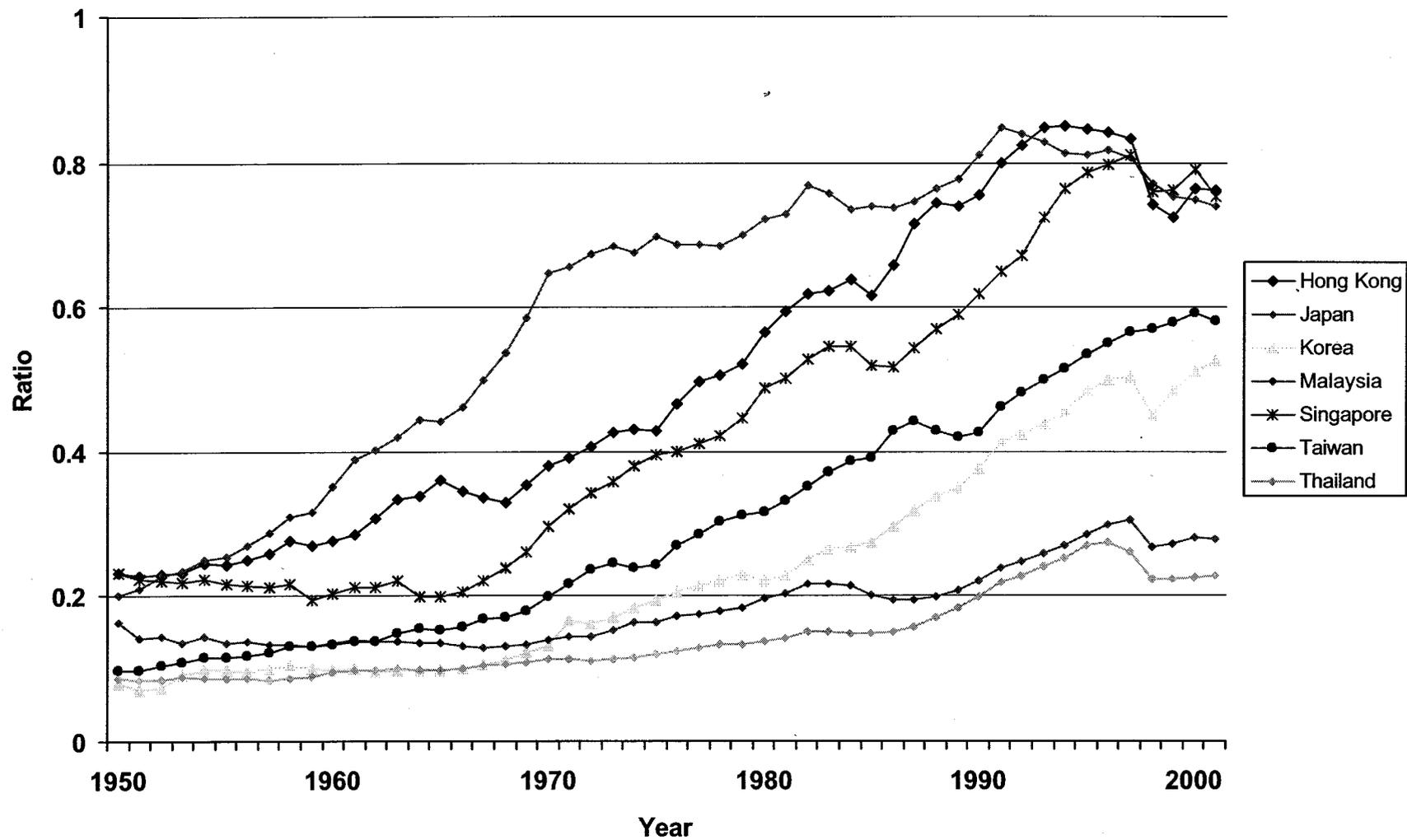


Figure 5: Latin American GDP Per Capita Relative to US

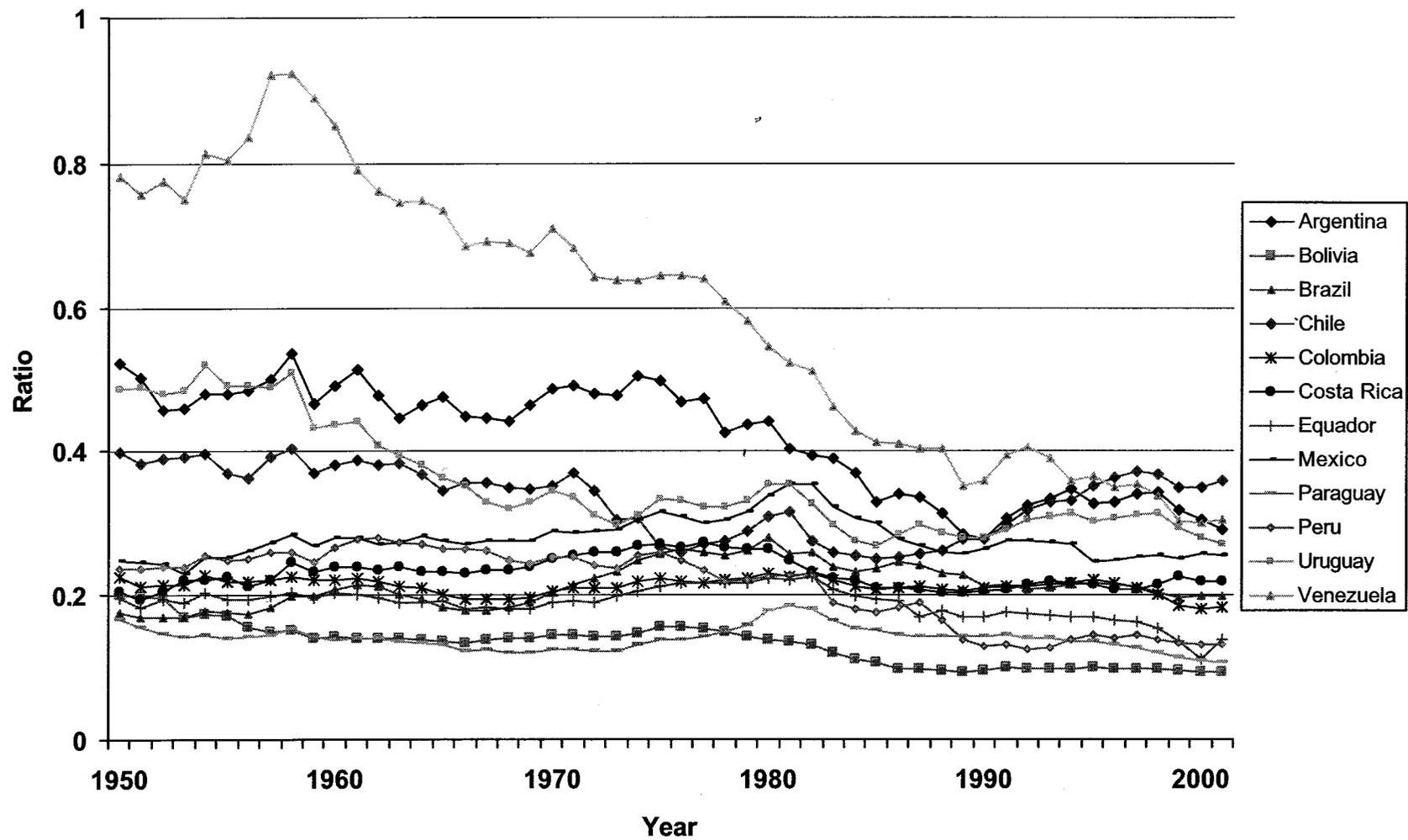


Figure 6: Labor Productivity Relative to US by Region

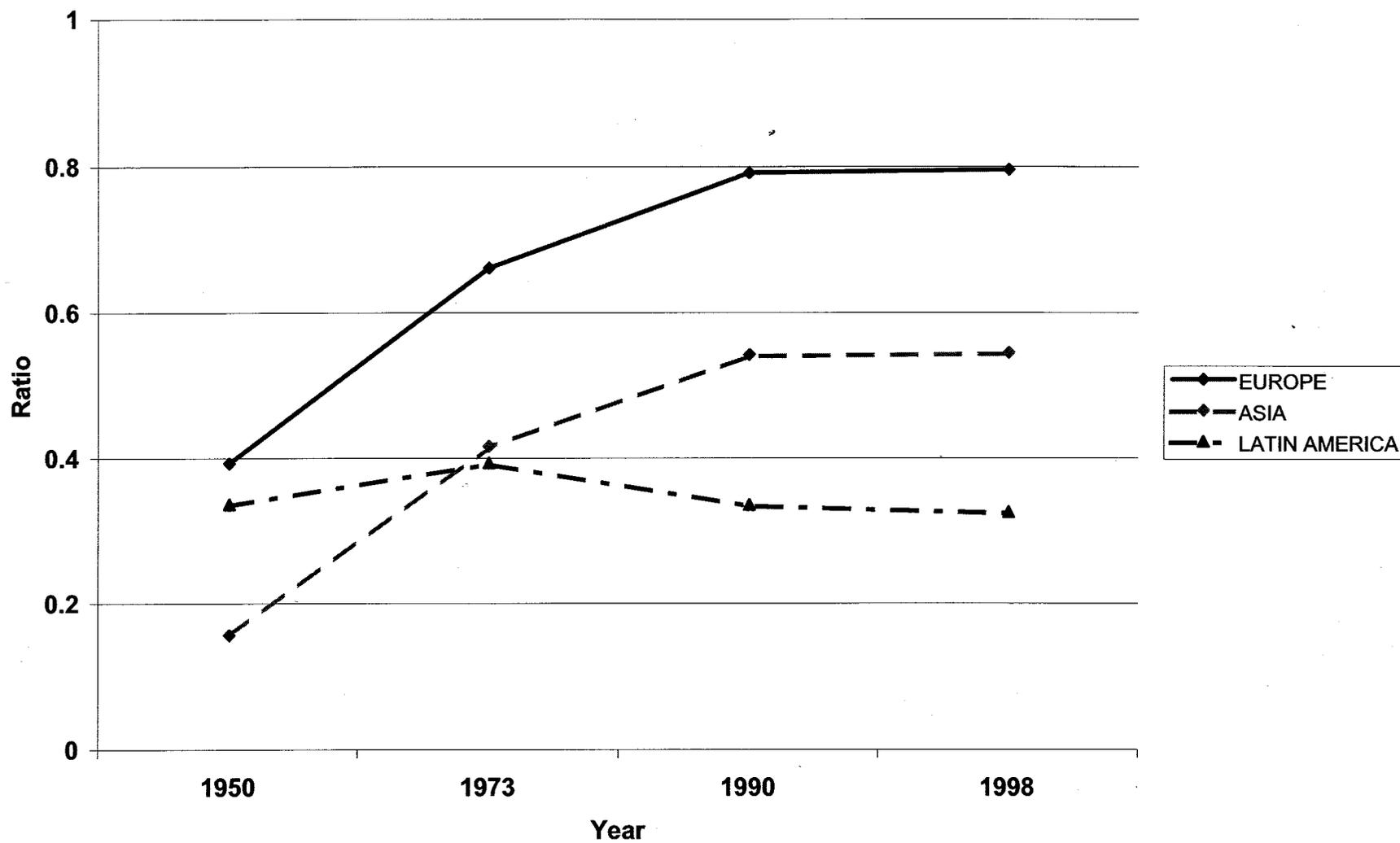


Figure 7. Trade Share and GDP (60s Average)

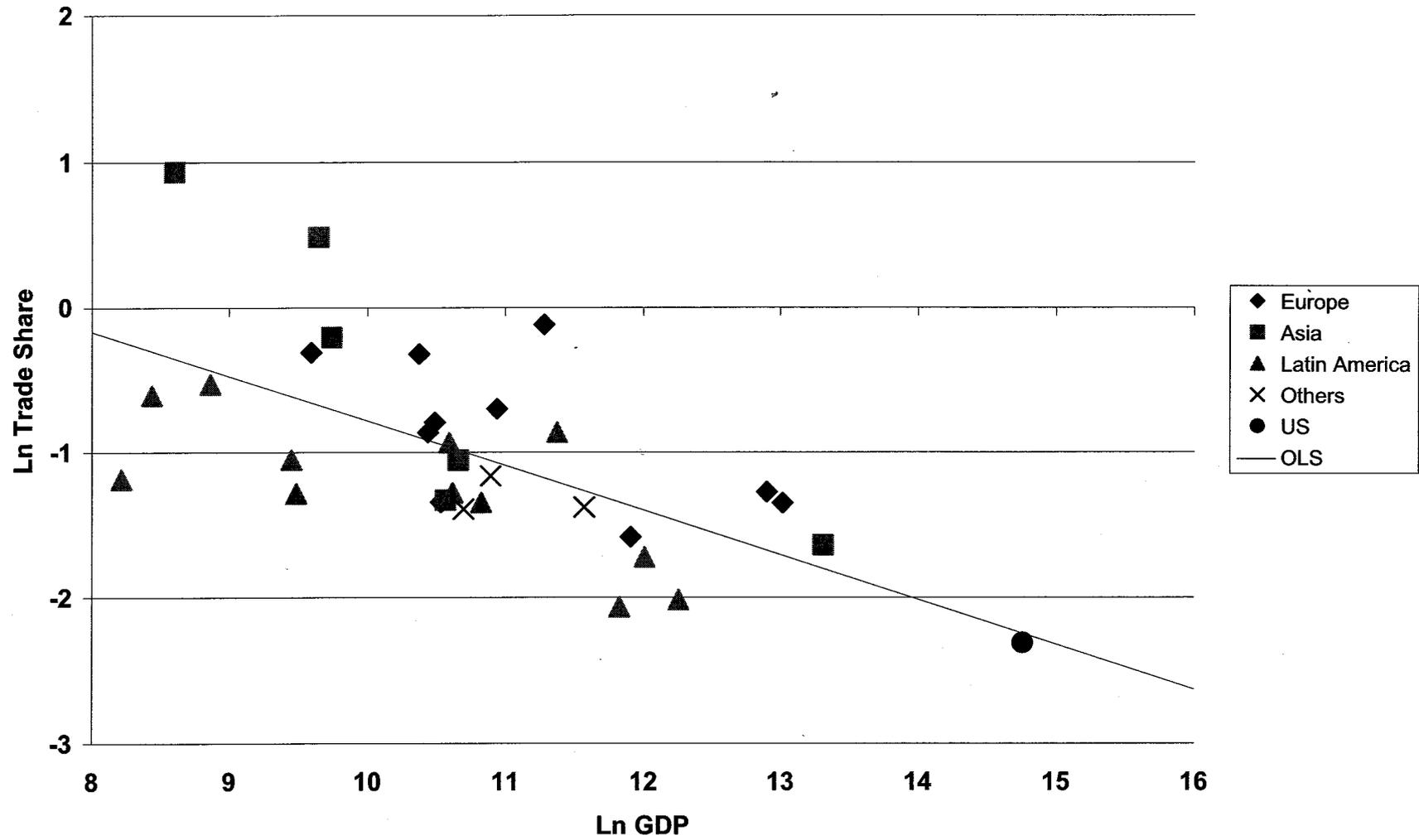


Figure 8. Trade Share and GDP (70s Average)

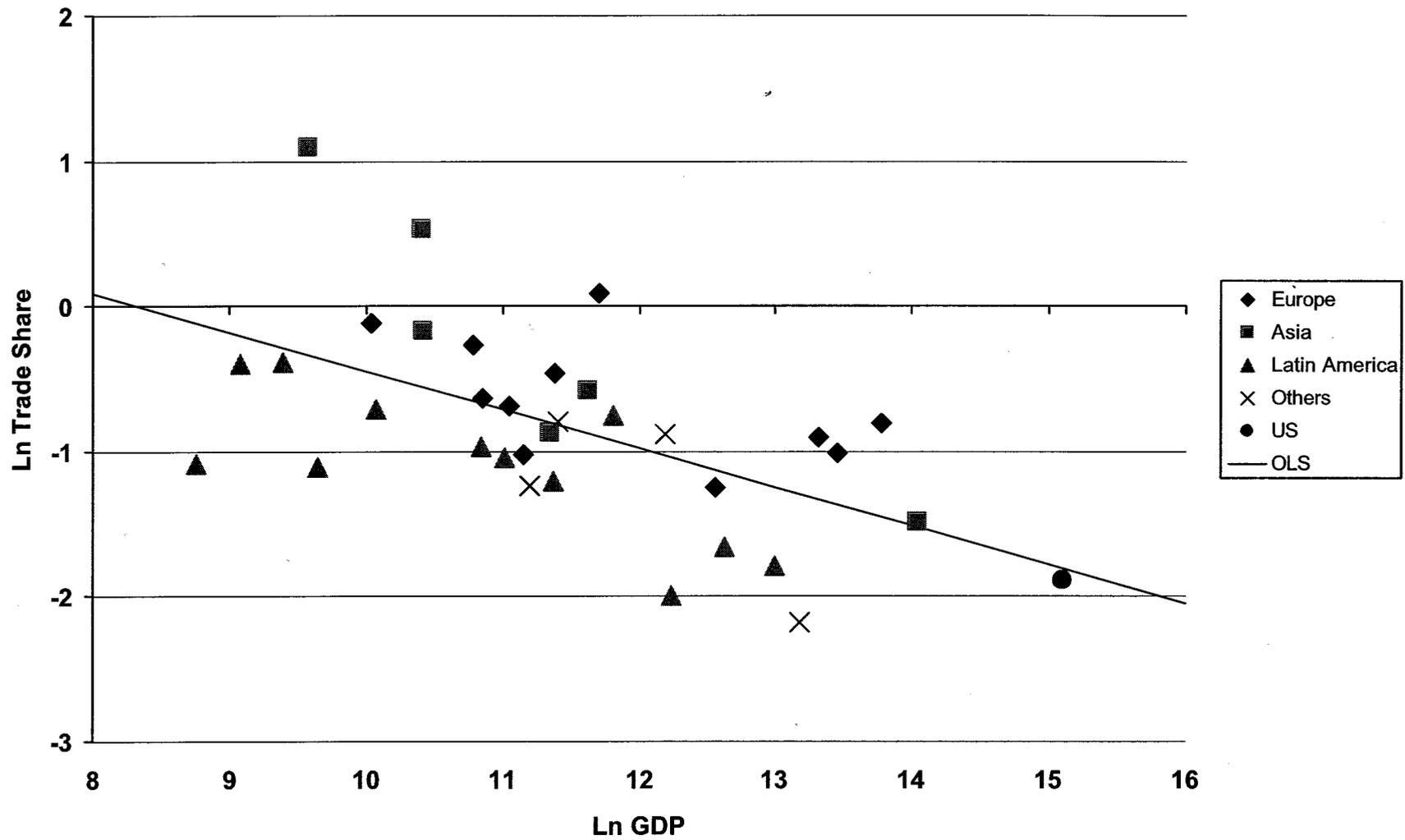


Figure 9. Trade Share and GDP (80s Average)

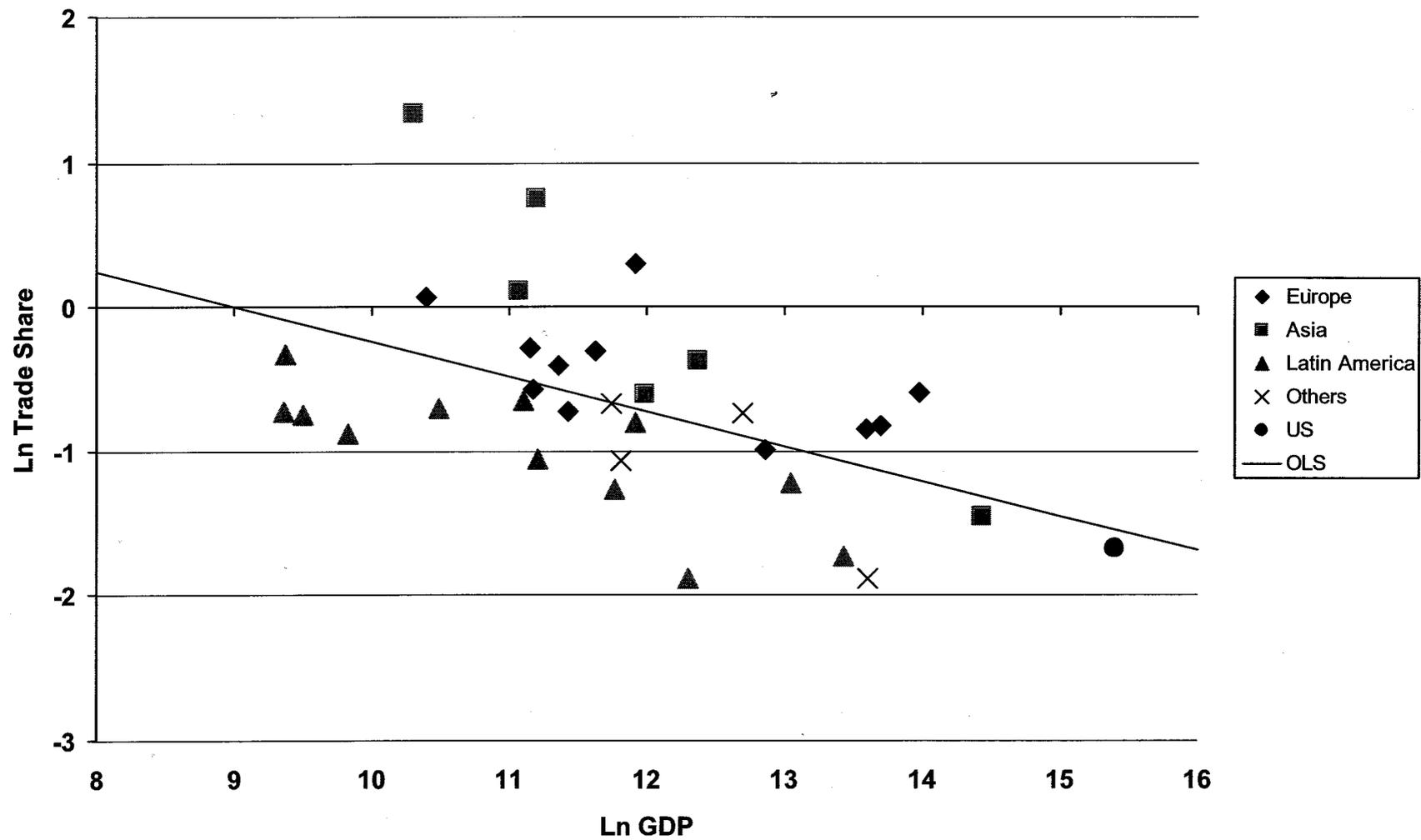
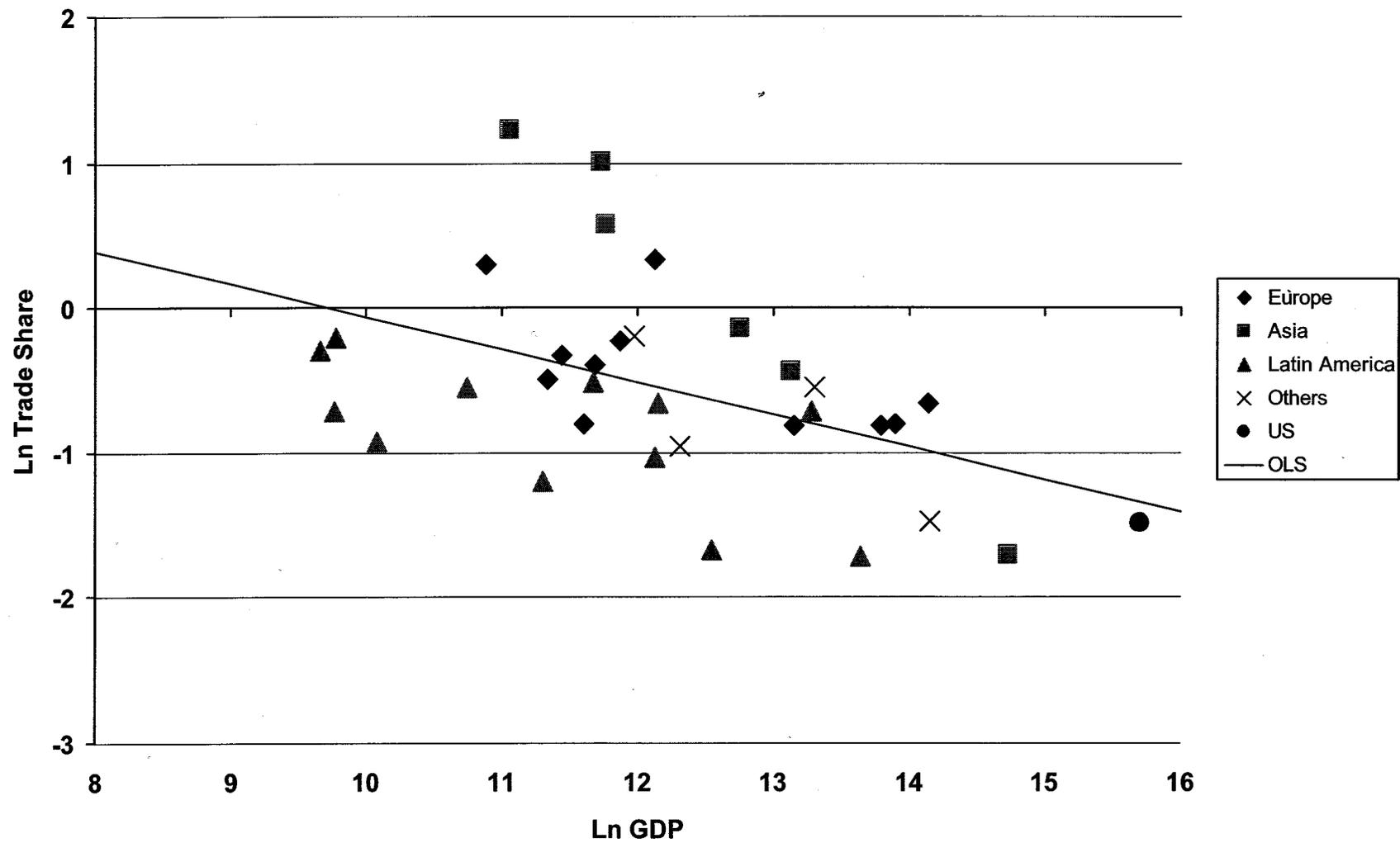
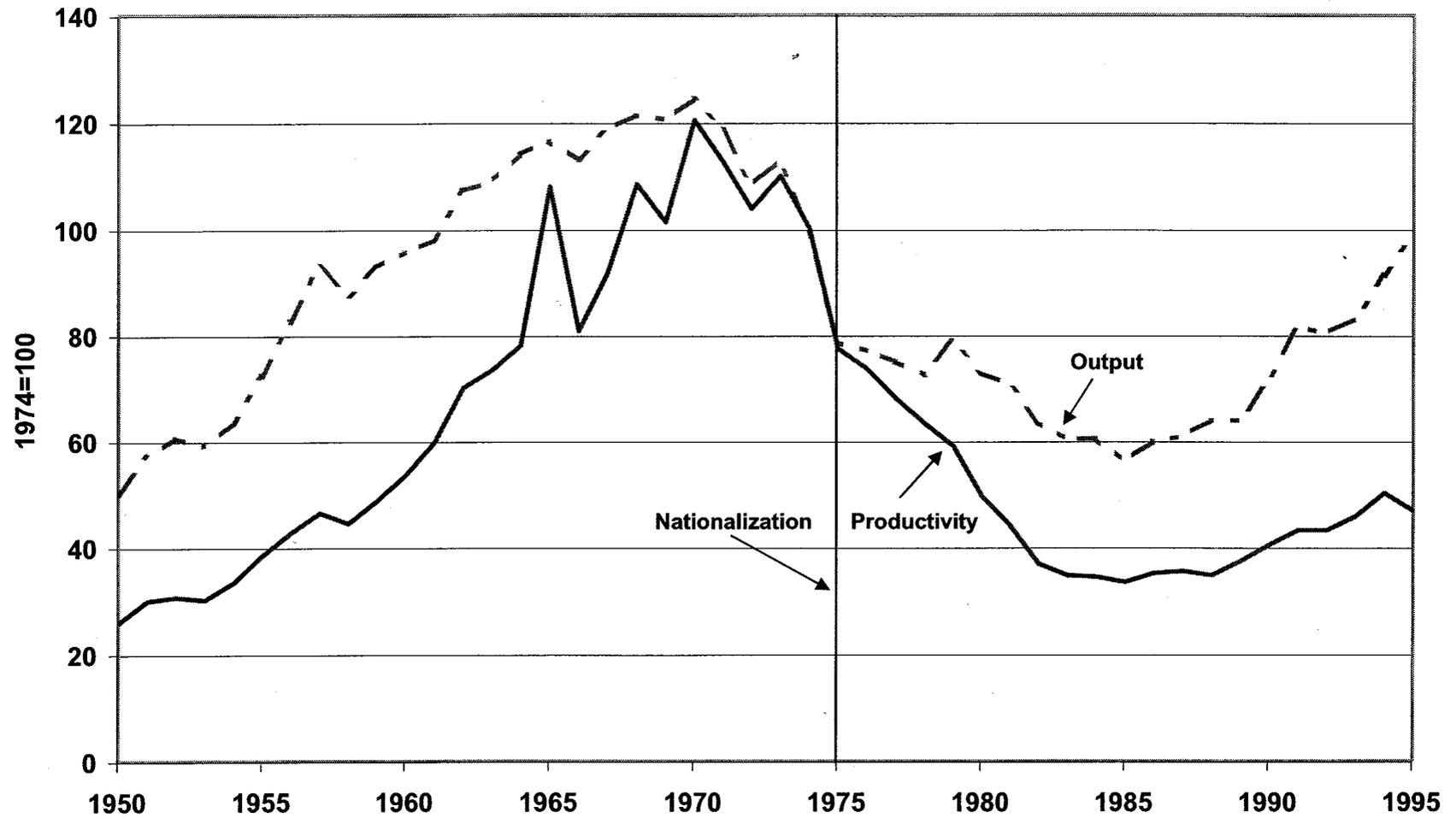


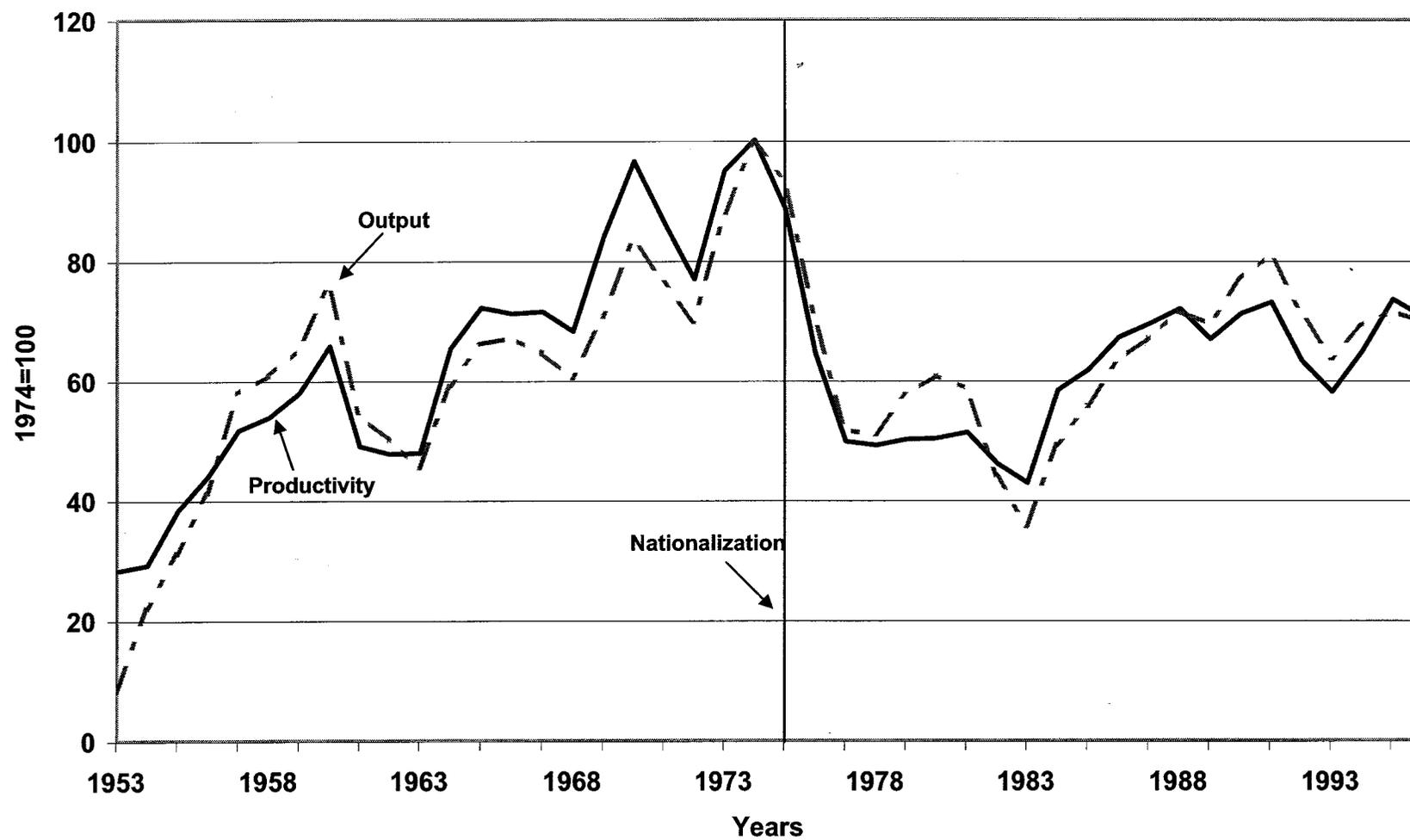
Figure 10. Trade Share and GDP (90s Average)



**Figure 11. Output and Labor Productivity of the Petroleum Industry in Venezuela  
(1950-1997)**



**Figure 12. Output and Labor Productivity of the Iron-Ore Industry in Venezuela  
(1953-1996)**



**Figure 13. Copper Production in Chile and Codelco's (State-Firm) Share of Production**

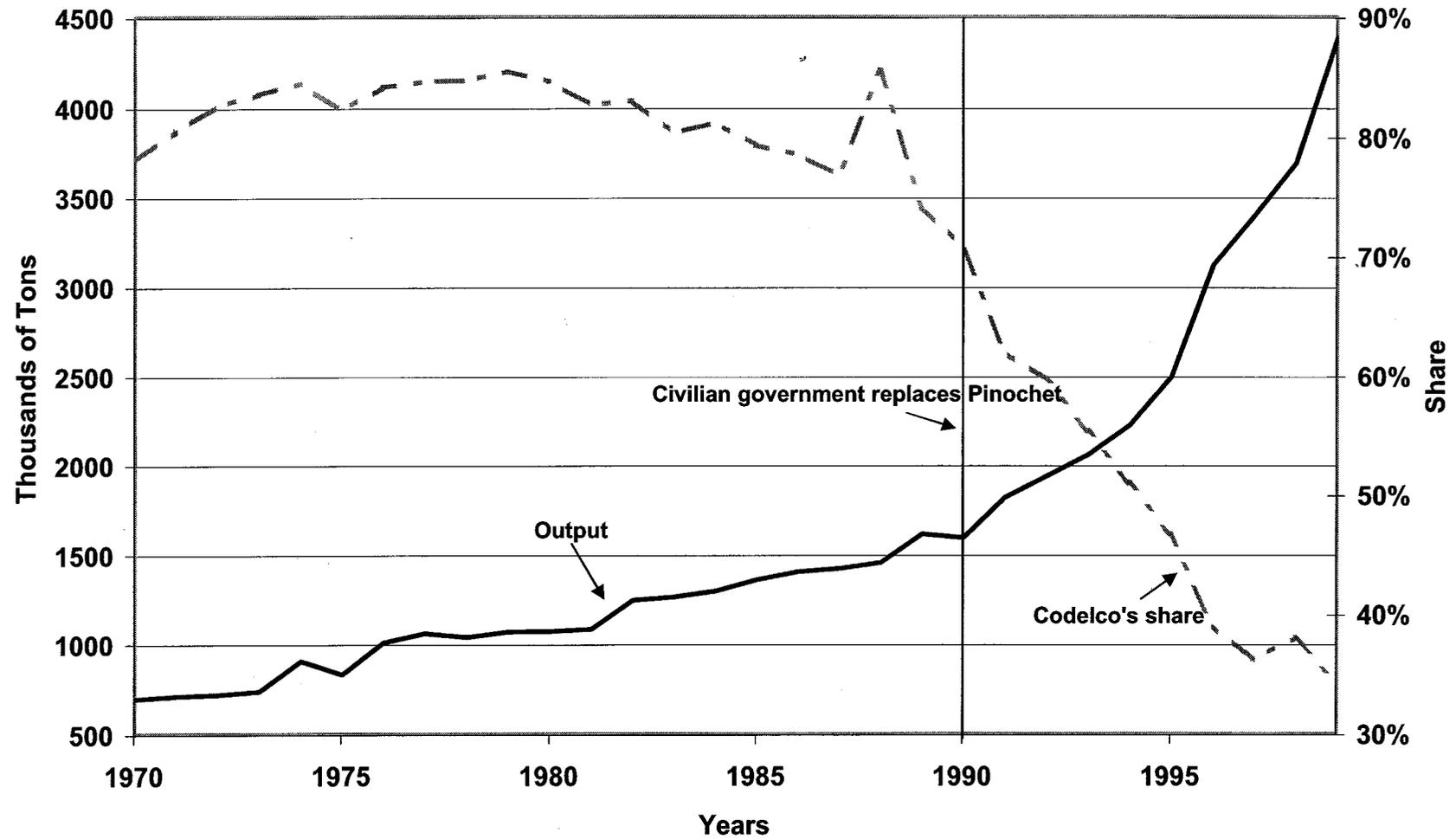


Figure 14. Labor Productivity and Output in the Chilean Copper Industry, 1970-2001

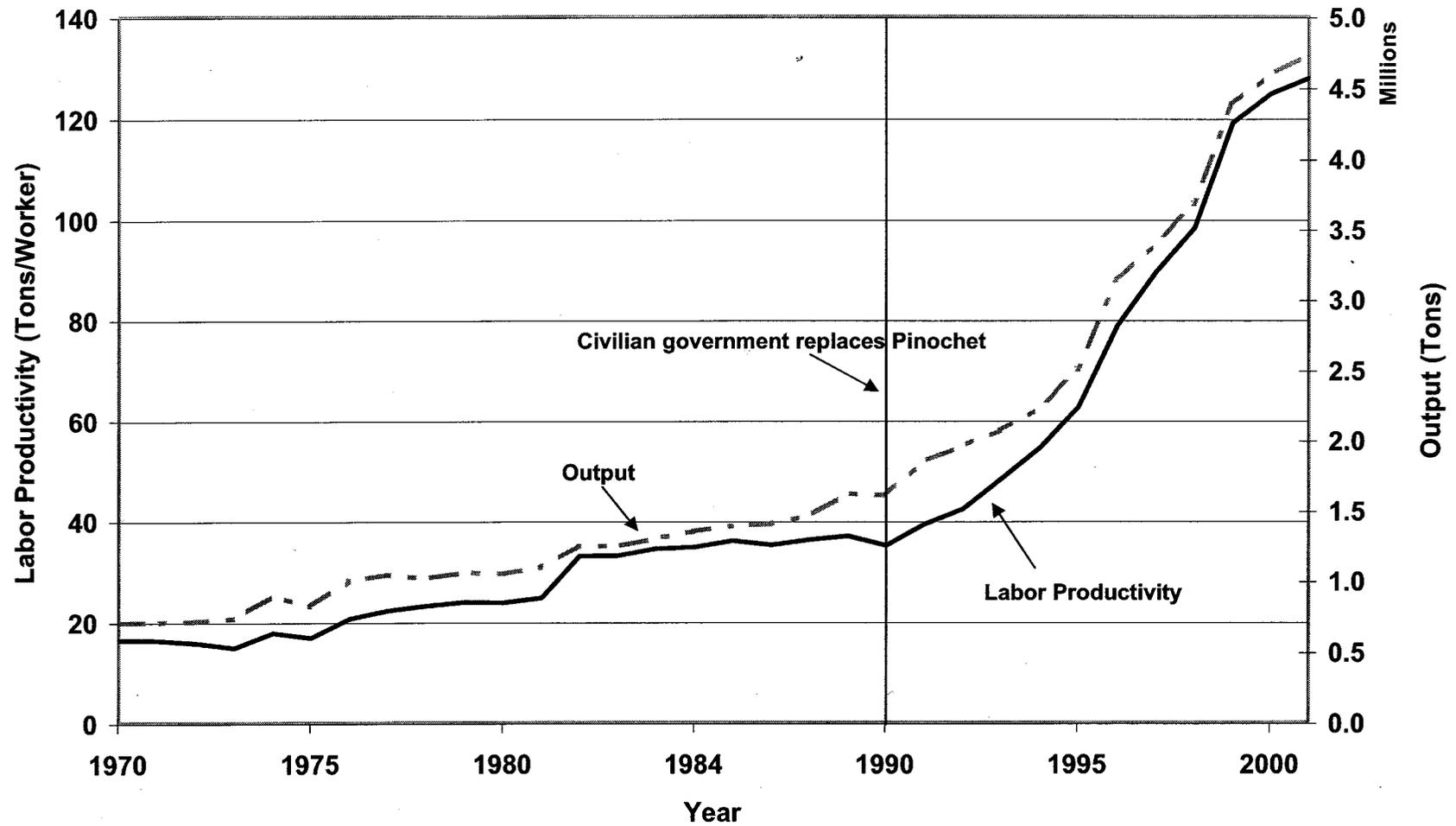
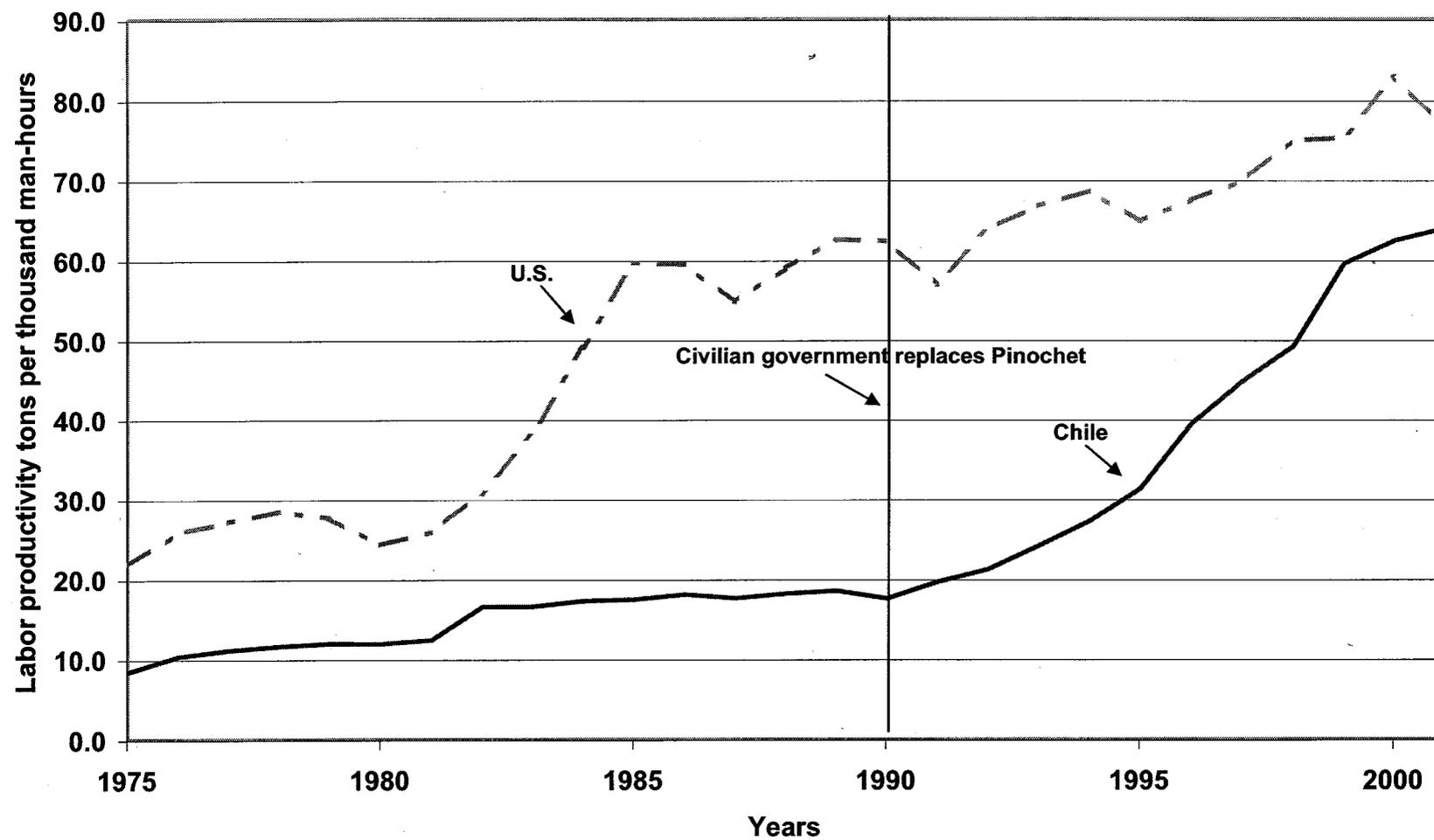


Figure 15. Labor Productivity in the U.S. and Chilean Copper Industry, 1975-2001



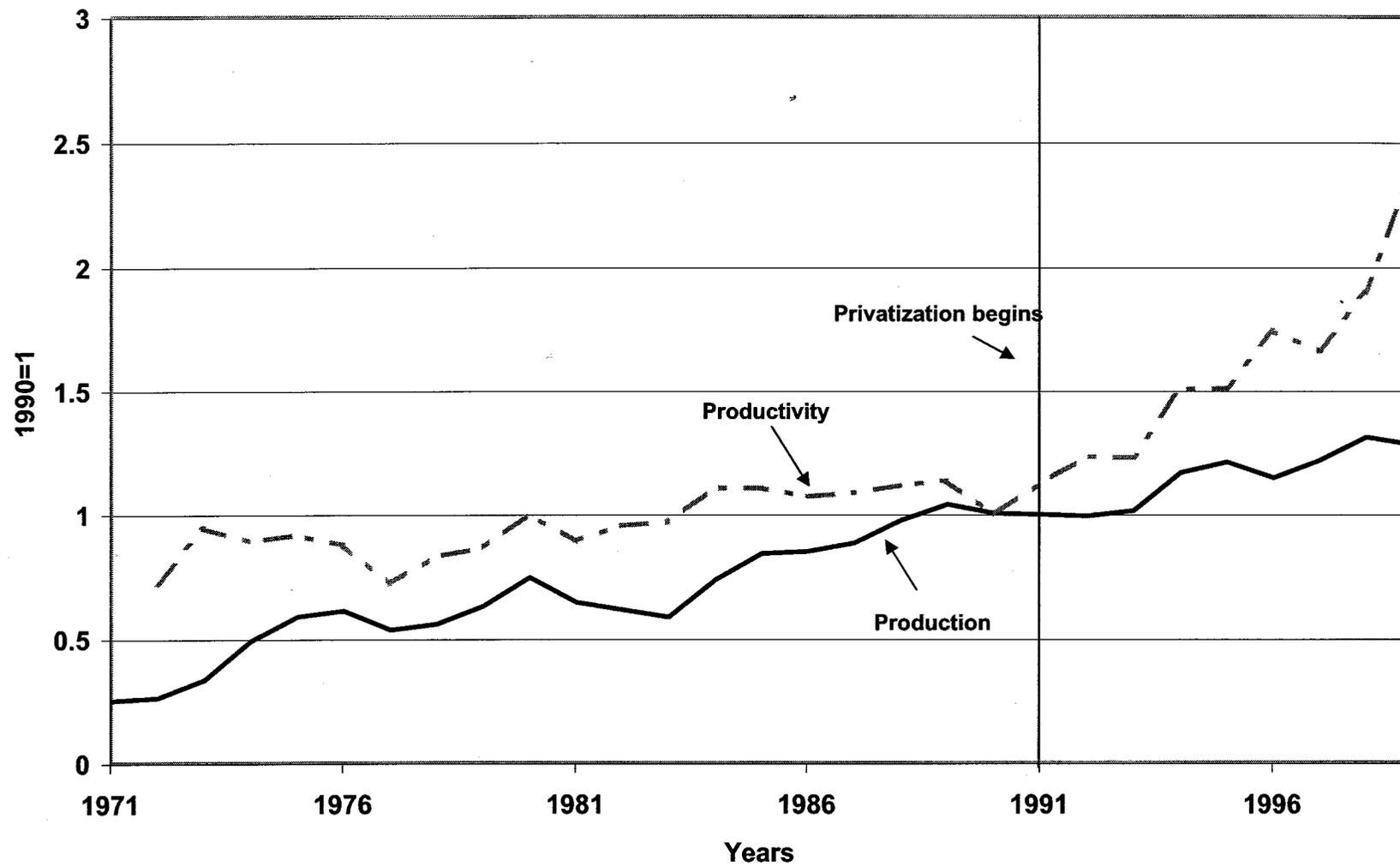
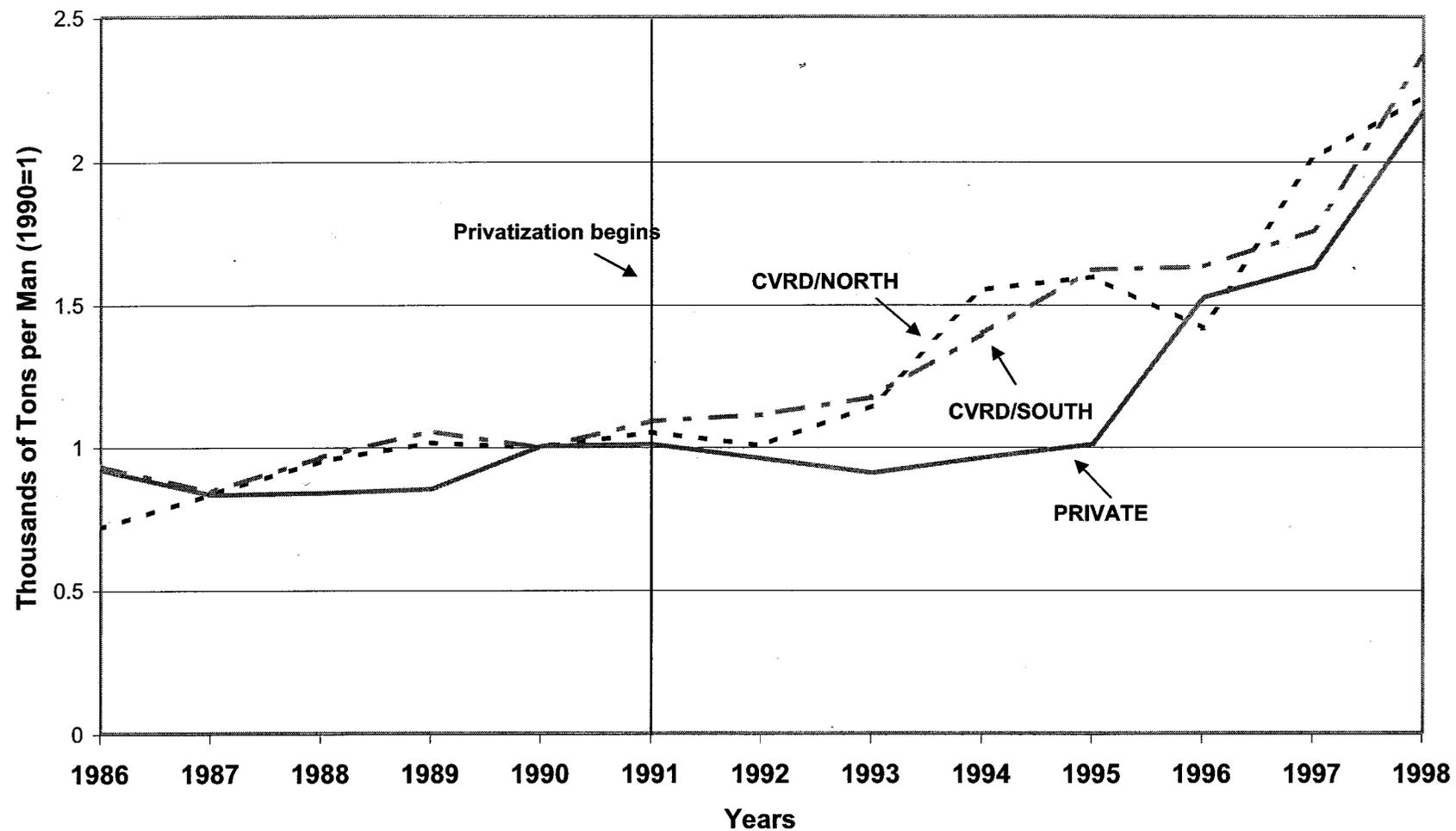
**Figure 16. Production and Productivity Brazilian Iron-Ore Industry, 1971-97**

Figure 17. Labor Productivity in Brazilian Iron-Ore  
CVRD/NORTH, CVRD/SOUTH, AND PRIVATE



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# Introduction

James J. Heckman and Carmen Pagés

---

## I.1 Introduction

This book uses microdata from diverse Latin American and Caribbean countries to investigate the impact of regulation on their labor markets. Common methodologies are applied to extract empirical regularities from the region. Latin America and the Caribbean are of interest in their own right. But for several reasons, the lessons learned from studies of these labor markets have much greater generality.

The shifts in the policy regimes experienced in the region are dramatic by the Organization for Economic Cooperation and Development (OECD) standards, and many of these regime shifts are exogenous. This large and exogenous variation provides identifying power not available to analysts studying regulation in Europe and North America. Given the evidence on the comparability of labor demand functions around the world summarized in Hamermesh (1993 and chap. 11 in this volume), lessons about the impact of regulation learned from Latin American labor markets apply more generally.

The studies in this volume are based on microdata. Use of such data avoids reliance on fragile country aggregate statistics that have been the

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main source of information used to study European regulation (see, e.g., the evidence summarized in Nickell and Layard 1999). Countries have diverse economic regions and agents, and aggregation over these regions and their economic agents masks this diversity. In this chapter, we show the sensitivity of estimates of the impact of regulation obtained from conventional pooled time series cross sections of countries to alternative choices of samples and models, although a few important empirical regularities established at the microlevel hold up in macrodata. Our analysis builds the case for doing disaggregated analyses of the type reported in this book.

The evidence presented here challenges one prevailing view that labor market regulations affect only the distribution of labor incomes and have minor effects on efficiency.<sup>1</sup> The results presented in this volume suggest that mandated benefits reduce employment and that job security regulations have a substantial impact on the distribution of employment and on turnover rates. The most adverse impact of regulation is on youth, marginal workers, and unskilled workers. Insiders and entrenched workers gain from regulation, but outsiders suffer. As a consequence, job security regulations promote inequality among demographic groups. Most of the individual country studies demonstrate that regulations promoting job security reduce covered worker exit rates out of employment and out of unemployment, and on balance reduce employment.

This introductory essay has three main goals: (1) It summarizes the main lessons to be drawn from the studies assembled here; (2) It places the Latin American and Caribbean (LAC) regulatory burden in an international context by comparing the level and changes in LAC labor regulation policies with those in OECD countries, as well as providing some historical context about the origins of this regulation; and (3) It updates the work of Heckman and Pagés (2000) with an expanded sample and better measures of regulation, providing a cross-country time-series analysis of the impact of regulation on employment and unemployment. We quantify the cost of regulation in LAC and OECD regions. The fragility of the macro-based estimates documented in our paper suggests one reason why relatively little is known about the impact of regulations in Europe, despite an abundance of cross-country time series papers analyzing policies in that region. However, the macro time series literature does produce some empirical regularities. The methods used to analyze the microevidence presented in this book should be extended to produce more convincing evidence of the impacts of regulations on employment in the OECD region.<sup>2</sup>

This chapter proceeds in the following way. Section I.2 provides background on Latin American economic and labor market performance. Sec-

1. Freeman (2000) and Nickell and Layard (1999), among others, adopt this view.

2. See, however, the studies of Abowd et al. (1997), Abowd, Kramarz, and Margolis (1999), Abowd et al. (2000), Machin and Stewart (1996), Kugler, Jimeno, and Hernanz (2002), and others, who use microdata to investigate the impact of regulation in Europe.

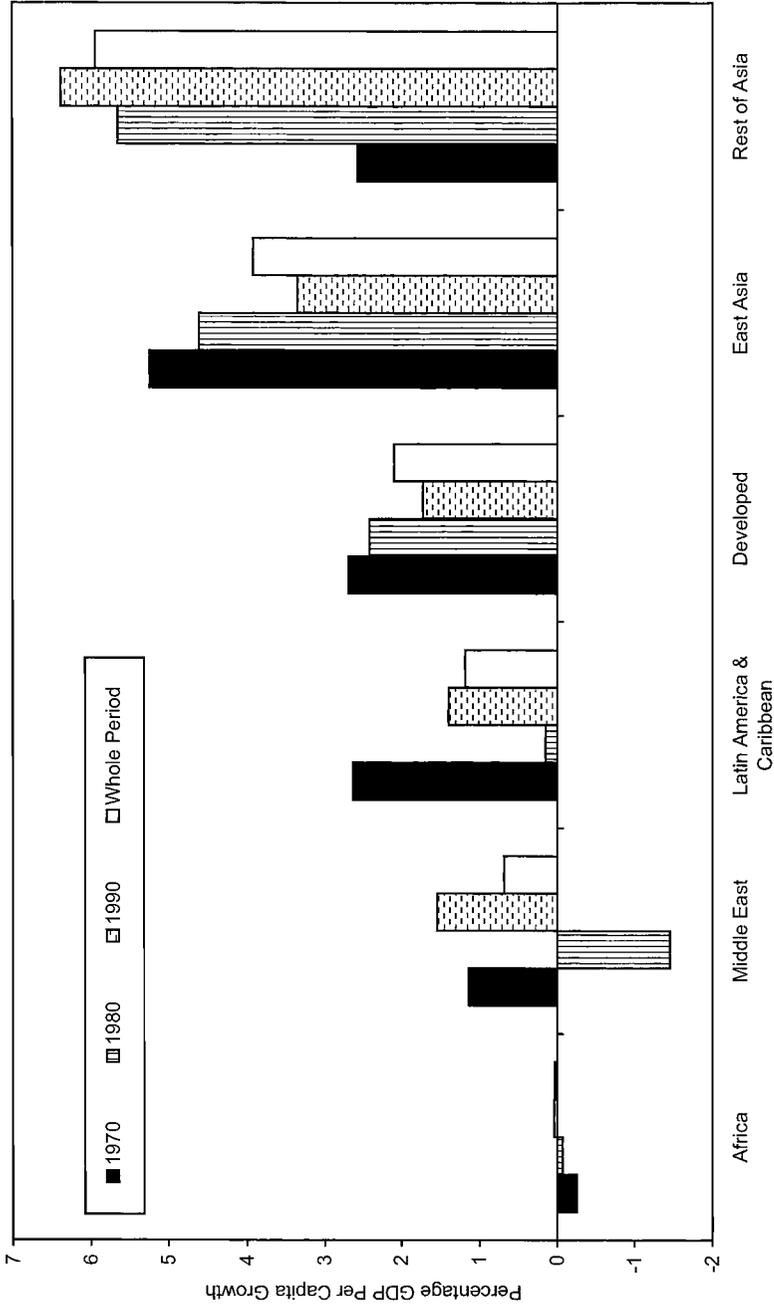
tion I.3 presents some basic facts about regulation in LAC and compares LAC with OECD countries both in terms of the level and composition of labor cost and in terms of the labor market reforms experienced in the region. Section I.4 summarizes the main lessons from the essays presented in this book. Section I.5 updates Heckman and Pagés (2000) and uses the cost measures derived in section I.3 to examine the impacts of labor regulation on Latin American and OECD employment and unemployment rates. Section I.6 concludes and makes suggestions for future work on regulation in Latin American and OECD labor markets. We first present some background on Latin America and the nature of labor market regulation in the region.

## **I.2 Latin American Economic and Labor Market Performance**

Latin American economic performance has been quite disappointing. Since 1970, growth of income per capita has been just over 1 percent per year, higher than in Africa or the Middle East, but much lower than in Asia or in the developed countries (figure 1). Up to the 1980s, trade policies heavily protected Latin American economies from foreign competition. There was a substantial degree of intervention by the state in the economy. The collapse of most economies during that decade due to growing fiscal and monetary imbalances led many countries to implement large structural reforms towards the end of the 1980s and early 1990s. Macroeconomic stabilization policies reduced fiscal deficits and brought inflation under control. Sweeping, fast-paced trade reforms lowered substantial tariff barriers on manufactured goods. Governments undertook fiscal reforms, lifted control over financial markets, and privatized most state-owned firms. Some countries also embarked on labor reforms described in the next section. While growth rates in the 1990s were higher than they were during the 1980s, the rates of growth in this period still fell short of those attained in other parts of the world.

Among the countries covered in this volume (Argentina, Brazil, Chile, Colombia, Peru, Uruguay, Barbados, Jamaica, and Trinidad and Tobago), Chile was the best performer, with an average growth rate of gross domestic product (GDP) of 4.8 during the period 1980–2001 (see table 1). Argentina and Trinidad and Tobago experienced the lowest average growth during the past two decades, despite high average growth rates during the nineties.

In spite of this weak economic performance, GDP per capita (purchasing power parity [PPP] US\$ adjusted) levels in Latin American countries are higher than those of other developing regions. According to the World Bank Development Indicators, in 2001 the average GDP per capita in the Latin America and the Caribbean region was \$7,050, considerably higher than that of East Asia and the Pacific (\$4,233), Central and Eastern Europe (\$6,598), South Asia (\$2,730), Sub-Saharan Africa (\$1,831) or the



**Fig. 1 Per capita GDP growth**

Source: IADB calculations based on World Development Indicators (World Bank 2001).

Note: Averages are GDP weighted.

**Table 1** Latin American and Caribbean Economic Performance Indicators

Country	GDP per Capita, 2001 (PPP US\$)	Human Development Index (HDI) Value, 2001	GDP Growth, 1980–2001	Employment Growth, 1980–1999	Female Labor Force Participation Growth, 1980–1999	Average Urban Unemployment Rate, 1980–2000
	(1)	(2)	(3)	(4)	(5)	(6)
Argentina	11,320	0.849	1.132	1.16	1.12	9.30
Brazil	7,360	0.777	2.488	2.72	2.11	5.62
Chile	9,190	0.831	4.814	2.63	2.17	10.09
Colombia	7,040	0.779	3.089	3.23	3.56	12.10
Peru	4,570	0.775	1.553	3.52	2.27	8.03
Uruguay	8,400	0.834	1.795	1.43	2.37	10.62
Barbados	15,560	0.888	1.173	1.28	1.30	15.77
Jamaica	3,720	0.757	1.557	1.60	0.89	19.40
Trinidad and Tobago	9,100	0.802	0.108	0.78	1.30	15.85
Average	8,470	0.810	1.970	2.04	1.90	

*Sources:* Columns (1), (3), and (5) World Development Indicators (World Bank 2001); column (2) United Nations (2001); columns (4) and (6) Economic Commission for Latin America and the Caribbean (ECLAC 2001) and International Labour Organization (ILO 2002).

*Notes:* Column (3) is measured in local currency at constant prices; in column (6) the Caribbean rates are not comparable to Latin American rates because they are computed with a different methodology.

Arab States (\$5,038). Similarly, the regional Human Development Index computed by the United Nations for LAC (0.77) was almost as high as in Central and Eastern Europe (0.78) and higher than in any other region except for the OECD (0.90). Among the countries whose labor markets are analyzed in this volume, Barbados and Argentina exhibited the highest income per capita and human development indexes, while Jamaica and Peru rank the lowest among the countries, both in per capita income and in human development (see table 1).

While GDP growth rates were not high, during the period 1980–1999 employment rates grew in the nine countries studied here. The highest growth rates were recorded in Colombia and Peru, countries that also experienced fast growth in female labor force participation. In contrast, average employment growth rates were low in Trinidad and Tobago and in Argentina. According to the International Labor Organization (ILO) and the Economic Commission for Latin America and the Caribbean (ECLAC) data, average urban unemployment rates during the 1980s and 1990s exceeded 8 percent in all countries analyzed in this book except for Brazil. Unemployment comparisons should be treated cautiously because they are not strictly comparable. For instance, in the Caribbean countries the unemployment rates include discouraged workers (those who drop out of the labor force), while such workers are excluded in the Latin American countries, which compute unemployment rates according to more traditional definitions.<sup>3</sup> Many have remarked that the high level of regulation of economic activity in the region accounts for problems in the labor markets in the region, and the essays assembled here shed light on this conjecture.

### **I.3 Labor Market Regulations and Institutions in Latin America and the Caribbean**

This section sketches the history of labor market regulation in the region and describes and quantifies the regulatory environment in Latin America and the Caribbean. It compares the level of regulation and pace of regulatory reform in LAC countries and OECD countries. When it is credible to do so, we also make an effort to quantify the monetary costs (as a percentage of wages) of full compliance with regulations without discussing whether costs are borne by workers or firms. We discuss this issue more extensively in sections I.4 and I.5.

#### **I.3.1 Regulations Governing Individual Contracts**

Throughout Latin America, labor codes determine the types of contracts, the lengths of trial periods, and the conditions of part-time work.

3. That is, they only include persons who are available for work and who are taking specific steps to search for a job.

Regulations favor full-time, indefinite contracts over part-time, fixed-term or temporary contracts. As a form of worker protection, labor codes mandate a minimum advance notice period prior to termination, specify which causes are considered justified causes for dismissal, and establish compensation to be awarded to workers depending on the reason for the termination. In contrast, temporary contracts can be terminated at no cost, provided that the duration of the contract has expired. To prevent firms from exclusively hiring workers under temporary contracts, in most countries the use of such arrangements is severely restricted. Labor codes also limit trial periods—that is, the period of time during which a firm can test and dismiss a worker at no cost if his or her performance is considered unsatisfactory.

Although most OECD countries began regulating their labor markets when they had attained relatively high income per capita, Latin America and other developing countries started regulating their markets much earlier in the development process (Lindauer 1999). The first regulations date from the beginning of the twentieth century. The motivation for these regulations was the perceived need to protect the welfare of workers against the excessive power of employers, and to insure workers against the risk of job loss and income insecurity (Lindauer 1999). The Mexican Constitution of 1917 articulated the principle that protecting workers was one of the duties of the state. By the 1930s and 1940s, most countries had a labor code. The belief that each new reform should only strengthen the set of warranties and benefits awarded from previous laws became widespread. For many years, successive reforms expanded the protection that the law afforded to workers. There was little examination of the question of whether such regulations would affect economic performance. However, until the 1980s most countries in the LAC region were isolated and their industries heavily protected. Labor regulations were one way of distributing the rents from protection among covered workers and employers. Regulations are a low-cost way (from the point of government fiscal authorities) of providing social insurance to protect workers. The weak fiscal systems in place in the region together with the low level of income, and a tradition of tax evasion, corruption, and noncompliance made the social insurance schemes used in more developed countries prohibitively costly.

Military rule often led to deregulation of labor markets. Unions were frequent targets, as much for political as for economic reasons. The political and economic environment in LAC changed substantially in the 1980s and 1990s. Most countries restored democracy after long periods of military rule. These political changes bred some labor reforms—first, to restore union activity, which had been made illegal in many military regimes and, second, to reach a new social pact. In Chile, Brazil, and the Dominican Republic, at the beginning of the 1990s and later in Nicaragua in 1996, these reforms produced more protective labor regulations.

A new constitution was enacted in 1988 in Brazil as part of the process of redemocratization during the second half of the 1980s (see Barros and Corseuil, chap. 5 in this volume). This new constitution revised labor regulations that had been in place since the 1940s. The new constitution reduced the maximum working hours per week from forty-eight to forty-four hours; reduced the maximum number of hours for a continuous work shift from eight to six hours; increased the minimum overtime premium from 20 percent to 50 percent; increased maternity leave from three to four months; and increased the value of paid vacations from 1/3 to at least 4/3 of the normal monthly wage. The new constitution also modified the mandatory individual saving accounts system created in 1966. Prior to the reforms, the law required employers to deposit 8 percent of employees' wages into a worker-owned account. In case of a firm-initiated separation, workers could withdraw the accumulated funds (plus the interest rate). In addition, if a firm initiated a separation, it had to pay a penalty equivalent to 10 percent of the amount accumulated in the account. As part of the 1988 reform, this penalty was increased to 40 percent, considerably increasing the cost of dismissing a worker.

In the case of Chile, the 1990 reform introduced with the return to democracy reestablished some of the protection to workers that had been eliminated during the military regime. Under the dictatorship, union activity had been severely restricted and some benefits, such as indemnities for dismissal, had been substantially reduced.<sup>4</sup> In 1990, the new law increased maximum indemnities from five to eleven months of pay. It also reintroduced the need for firms to prove just cause for dismissal, although unlike the case in other countries, the new law considered the economic needs of the firm a just cause.

While in some countries lawmakers were busy increasing legal protection for workers, the economic environment was changing substantially. The deep economic crisis that ensued with the debt crisis of the early 1980s called into question the protectionist model. The relatively good performance of the Chilean economy, which in the mid-1970s opened to trade and introduced many promarket reforms, spawned imitators all across Latin America. By the second half of the 1980s and the early 1990s, most countries had drastically reduced tariffs on imports. The new openness to international trade increased the demand for labor market flexibility. It was argued that without sweeping labor market reforms, Latin American economies would not be able to compete internationally. This was the main motivation behind the reforms that introduced temporary contracts in Argentina, Colombia, Ecuador, Nicaragua, and Peru and that reduced the cost of dismissing workers with indefinite contracts in Colombia (1990)

4. See Montenegro and Pagés, chap. 7 in this volume.

and Peru (1991). Temporary and fixed-term contracts were introduced in Argentina in 1991, and their role was expanded in 1995 (see Hopenhayn, chap. 9 in this volume). These changes were influenced by similar reforms in Spain during the 1980s. Special fixed-term duration employment promotion contracts could be awarded to unemployed workers and to workers younger than twenty-five and older than forty years old. For some types of contracts, severance pay was reduced by 100 percent. However, these contracts were eliminated in 1998, when the share of persons working under these arrangements had increased substantially. Ecuador, Peru, and Colombia also lifted restrictions on the use of these types of programs in the early 1990s. In Peru, the number of workers hired under these contracts increased enormously. In Brazil, the use of such contracts has been liberalized since 1998.

The 1991 reforms in Peru reduced the cost of dismissing workers hired under indefinite contracts. During 1971–1991, workers who had completed trial periods were granted permanent job security. If a firm dismissed a worker and could not prove just cause in labor courts, the worker could choose between being reinstated in his or her job or receiving a severance payment of three months' wages per year of work (with a maximum of twelve months pay). In practice, because workers could always ask to be reinstated and then settle for a higher severance pay, the mandatory amount was a lower bound of the firing cost. See Saavedra and Torero (chap. 2 in this volume).

Beginning in 1991, workers hired after that year could be dismissed at will upon payment of a severance benefit. In addition, just cause clauses were extended to allow the dismissal of workers who did not perform up to expectations. The severance pay schedule was reduced from three months' wages to one month's wage for every year of tenure for workers with more than one year in the firm, with a minimum of three months' wages and a maximum of twelve. The 1993 constitution replaced the right of workers to a permanent job with the right of firms to dismiss workers. In July 1995, a second wave of labor reforms simplified the severance payment to one month per year of work, up to a maximum of twelve months, and the two-tier severance system was eliminated. These modifications substantially reduced the cost of dismissing workers. However, in November 1996 the severance payments rule was increased again to one and one-half months' wages per year of work, with an unaltered maximum cap of twelve wages.

In Colombia, the 1990 labor reforms liberalized many aspects of labor regulation. Besides regulations introducing the use of temporary contracts, the most important changes were those in the *Cesantias*, or severance pay that firms owed to workers at the end of the work relationship, regardless of the cause or the party that initiated separation. Prior to the reforms, employers were mandated to pay severance of one month per year at the time of the separation based on the salary at the separation. Work-

ers could obtain advanced payments against their benefits. Such withdrawals were credited against the severance pay due to workers at the end of the labor relationship in nominal terms as of the date of the withdrawal. High rates of inflation increased the costs of such schemes to employers. After the reform, the withdrawals were credited in real terms, substantially reducing costs for firms. In addition, the reforms eliminated the right to reinstatement for workers with more than ten years of tenure. Offsetting these cost-reducing features, the reforms increased the cost of indemnities for dismissal.

Panama (1995) and Venezuela (1997) also undertook labor reforms with the goal of increasing labor market flexibility while preserving some form of protection to workers. In both countries, reforms increased mandatory pay in case of separation but considerably reduced the additional amount that firms had to pay in case of a firm-initiated dismissal.

In contrast to Latin American regulation, in the Caribbean a mixture of legislation, common law doctrines, custom, and policy characterizes the institutional context. At the beginning of the twentieth century, in all countries of that region, regulation of the labor market was based on common law rather than on the civil law tradition predominant in Latin America (see Downes, Mamingi, and Antoine, chap. 10 in this volume). While in some countries, like Barbados, most aspects of labor relation are still left to the courts to determine; in others, such as in Trinidad and Tobago, the enactment of different regulations has progressively increased the level of statutory protection to workers. In Barbados (1973), Trinidad and Tobago (1974), and Jamaica (1985), labor reforms instituted mandatory severance pay, although, as shown in the next section, at levels that are much lower than those prevalent in Latin America.

### 1.3.2 Payroll Contributions and Other Mandatory Benefits

As in most industrial countries, in LAC many social protection programs, such as old-age pensions, public health systems, unemployment subsidies, and family allowances are funded from payroll contributions. In addition, regulations mandate other employee-paid benefits such as occupational health and safety provisions, maternity and sick leave, overtime pay, and vacations.

Unlike changes in labor codes that tend to be infrequent events, changes in the level of contributions to these programs occur often. In addition, during the 1990s, many countries implemented reforms, which transformed pay-as-you-go systems into full or partial capitalization systems. One of the advantages of such schemes is that they tend to increase the link between contributions and benefits. However, at the same time, many countries, most noticeably Colombia, El Salvador, Mexico, Uruguay, and Brazil, increased the level of payroll taxes to reduce the actuarial imbalances present in their social security systems. Below, we quantify the levels

and changes in these contributions across Latin America and OECD countries.

### I.3.3 Collective Bargaining

Unions in Latin America tend to be firm- or sector-based and weak. In most cases, the state intervenes in union registration and accreditation as well as in the process of collective bargaining. The state authorizes only certain unions to have representation authority (Argentina, Mexico, Peru, and Brazil), and intervenes in the resolution of conflicts and the arbitration process (Argentina and Mexico). Only in Brazil and Argentina is collective bargaining highly centralized at the sector level, while in Nicaragua and Colombia, sector-level bargaining coexists with firm-based negotiation. In Mexico, collective bargaining takes place at the firm level, but a high level of centralization is achieved through a strong corporatist structure and through union discipline (O'Connell 1999). In contrast, unions are stronger, and collective bargaining tends to be national or sector-based in OECD countries, with the exception of Canada, New Zealand, the United Kingdom, and the United States.

According to data from ILO (1997–1998), union density as a percentage of nonagricultural employment is higher in Brazil, Mexico, Argentina, and Nicaragua and smaller in the rest of the Latin American countries. Union affiliation tends to be higher in countries where collective bargaining is more centralized. Overall, union density is lower in Latin America (14.7) than in industrial countries (36.6).<sup>5</sup> There are also large differences in coverage rates. Thus, while collective bargaining agreements in countries such as Spain, France, and Greece, which are negotiated by a minority, are extended to almost all employees, in Latin American countries this is generally not the case. As a result, coverage rates in Latin America tend to be much lower than those observed in OECD countries with similar affiliation rates.

The influence that collective bargaining exerts on wage and employment conditions, measured by affiliation rates, is declining over time. Thus, LAC countries share a trend that has been well documented for OECD countries. Affiliation rates have declined in all of the countries of the region.<sup>6</sup> This decline has been especially large in Mexico, Argentina, Venezuela, Costa Rica, and Uruguay. In this volume, we only present estimates for Uruguay on the impact of unionization on employment. Cassoni, Allen,

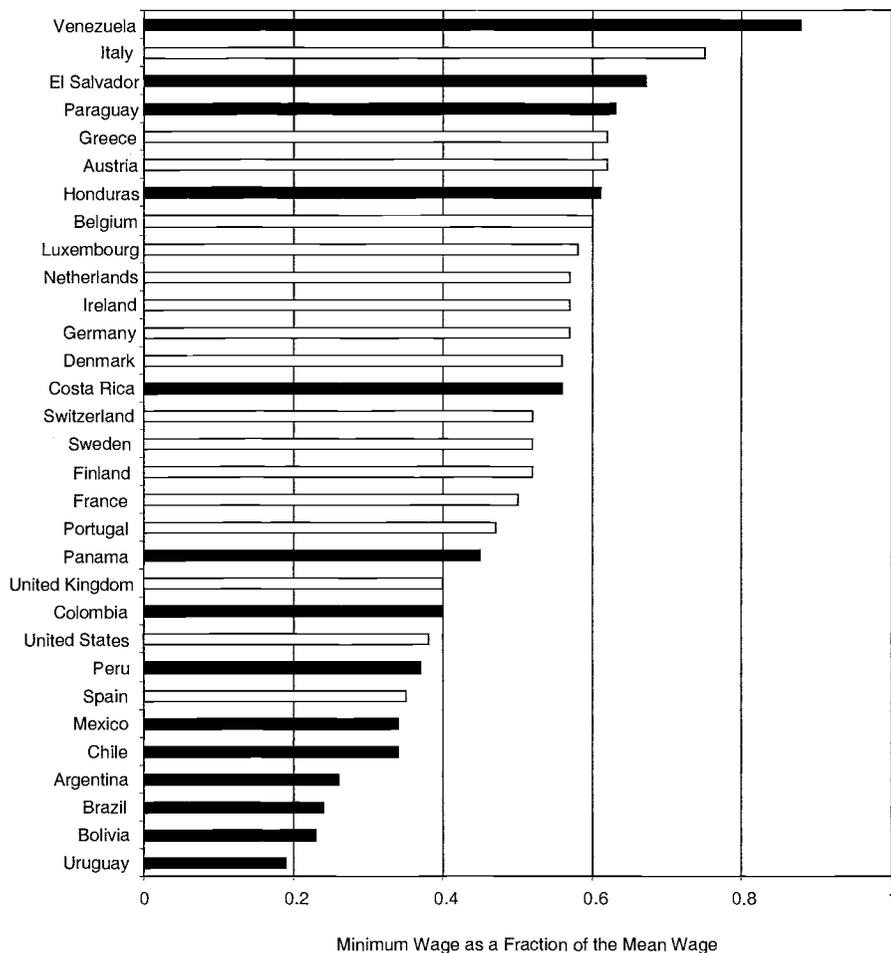
5. ILO data corresponds to the mid-1990s. The comparison between LAC and industrial countries reflects the difference between unweighted regional averages. The average for industrial countries includes the following countries: France, Spain, United States, Greece, Germany, Italy, United Kingdom, Denmark, Belgium, Finland, Iceland, Ireland, Sweden, and Canada.

6. The ILO data for 1985 and 1993 indicates that union affiliation increased in Chile during that period. Yet, data from a later period indicates that union affiliation has been declining since 1993.

and Labadie (chap. 8 in this volume) estimate a strong adverse impact of unionism on employment in Uruguay. The evidence for other Latin American countries is still too sparse.

### I.3.4 Minimum Wages

Minimum wages are widely used in Latin America to increase the wages of the poorest workers. Figure 2 (taken from Maloney and Nuñez Mendez,



**Fig. 2 Minimum wage/mean wage in OECD countries and in Latin America**

*Source:* Maloney and Nuñez Mendez (chap. 1 in this volume).

*Notes:* Minimum wages from Dolado et al. (1996), for one year within the range 1991 and 1995. Minimum wages for Latin America are from 1995 or 1996, except Argentina (1998), Bolivia (1997), Brazil (1998), Colombia (1998), Honduras (1999), Mexico (1999), and Uruguay (1998).

chap. 1 in this volume) ranks various Latin American and OECD countries by their minimum wage, standardized by the mean wage.<sup>7</sup> While some Latin American countries appear in the lower range of this distribution—most notably Uruguay, Bolivia, Brazil, Argentina, Chile and Mexico—others, such as Venezuela, El Salvador, Paraguay, and Honduras, have very high minimum to average minimum wages by OECD standards. These high levels suggest that minimum wages are likely to be binding, and, as a result, to reduce employment and to retard downward wage movements in the presence of adverse demand shocks.

Data on enforcement of the minimum wage is incomplete. However, some evidence available for workers between twenty-five and forty years old suggests that about 10 percent of wage employees in that age range earn salaries below the minimum wage (see table 2). In some countries, such as Mexico, Uruguay, Bolivia, and Argentina, the proportion below the minimum in this age range is very small. In other countries, such as Colombia, minimum to average wages are high but a large proportion of the labor force in the twenty-five to forty age range earns wages below the statutory minimum. Whether the adverse effect of a high level of minimum wages is offset by substantial noncompliance remains an open empirical question.

### I.3.5 What Motivates Reforms?

In studying the effect of reforms in the labor market it is important to examine what factors initiate these relatively infrequent episodes. It could be argued that labor market outcomes are driven by the same events that drive the reforms and not by the labor reforms themselves. Panels A–F of figure 3 (for Latin America) and panels G–I of figure 3 (for the Caribbean) plot GDP growth rates and unemployment rates for the countries covered in the individual country studies of this volume during the period 1980–2000. They also plot major episodes of labor reform (marked with a continuous line if a liberalization of the labor market occurred and a dotted line if the reforms increased protection to workers).<sup>8</sup> In addition, these figures mark episodes of major tariff reductions (double line) or the end of military regimes and the return to democracy (discontinuous line).

In Argentina, Colombia, Peru, and Uruguay, reforms that liberalized the labor market occurred within one or two years before or after major reductions in tariffs and were part of efforts to liberalize economies and increase the participation of the market in the production and allocation of goods and services. In Chile and Brazil, reforms that increased the legal

7. The observations are from the early 1990s for the OECD countries and from the mid- and late 1990s for LAC. Data from OECD were obtained from Dolado et al. (1996), data from LAC comes from IADB (1998–1999) and Maloney and Nuñez Mendez (chap. 1 in this volume).

8. Only major changes in labor codes or other major government interventions in the labor market are included. Changes in social security contributions or payroll taxes, as well as changes in the level of minimum wages—which occur quite frequently—are not included.

**Table 2** Compliance with Regulations

Country	% of Workers with Mandatory Social Security Programs		% of Workers 25–40 Years Old with Net Earnings Below Minimum Wage
	% of Total Employment (Mean 1990s)	% of Wage Employment (Mean 1990s)	Noncompliance with Minimum Wages (End 1990s)
Average Latin America <sup>a</sup>	42.76	60.05	10.06
Argentina	48.45	66.56	3.11
Bolivia (1999)	26.36	38.56	1.11
Brazil	48.18	64.04	5.80
Chile	64.47	77.45	7.3
Colombia (1999)	46.13	66.77	26.9
Costa Rica	65.92	74.61	15.7
Dominican Republic (1998)	29.08	49.40	n.a.
Ecuador (1995)	30.94	43.02	n.a.
El Salvador (1998)	33.49	50.04	3.6
Mexico	52.53	67.96	0.5
Panama (2001)	55.66	74.50	14.8
Paraguay (1995)	16.70	30.66	n.a.
Peru	17.99	51.90	23.5
Uruguay	74.12	93.12	0.5
Venezuela (1998)	31.37	52.22	17.9

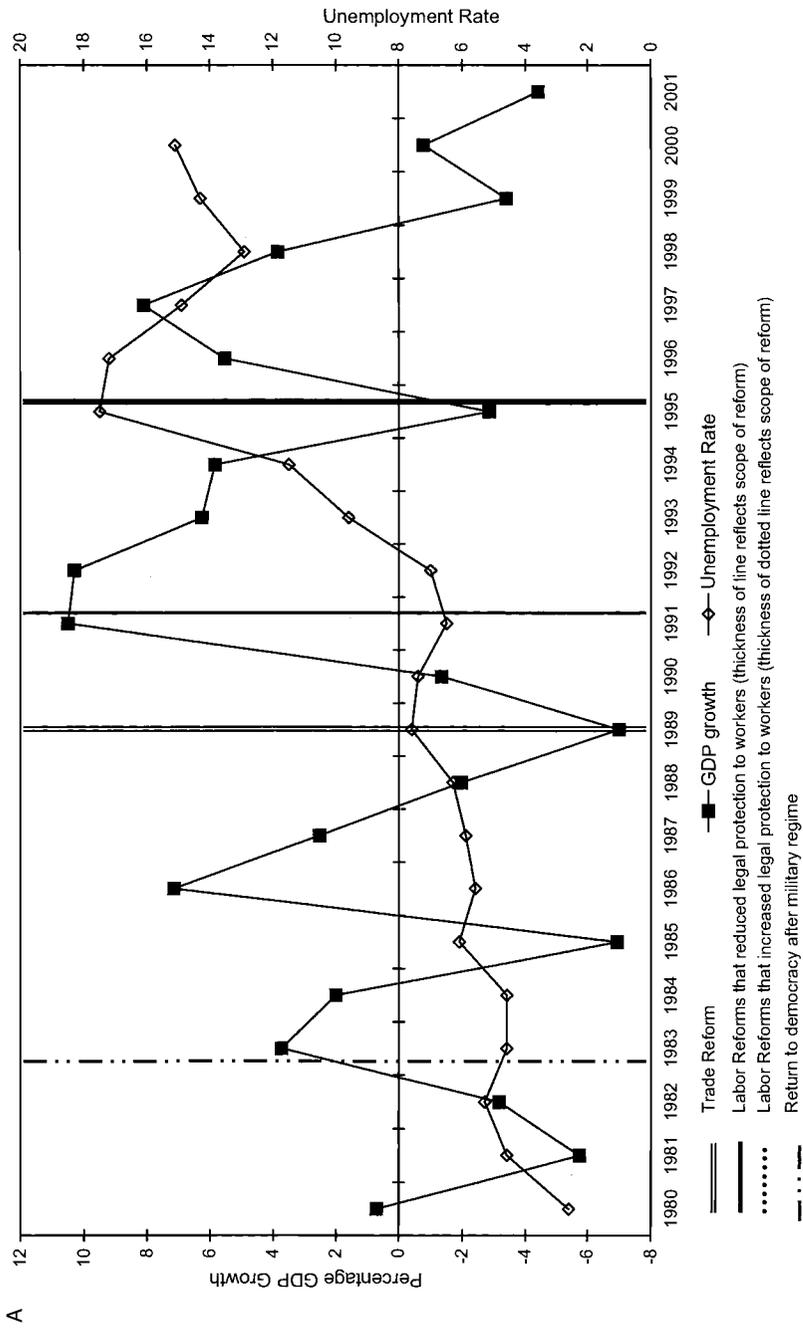
*Source:* IADB (2004), based on individual country household surveys.

*Notes:* Percentage of workers between fifteen and sixty-four that are affiliated to social security. Time series data for the 1990s is incomplete; the mean was computed when data included three or more years, spread over three periods: early (1990–1993), mid (1994–1997), and late (1998–2001). Noncompliance with minimum wage refers to employees between twenty-five and forty years old working more than thirty hours. Figures for this variable date from the late nineties. N.a. denotes not available.

<sup>a</sup>Unweighted average.

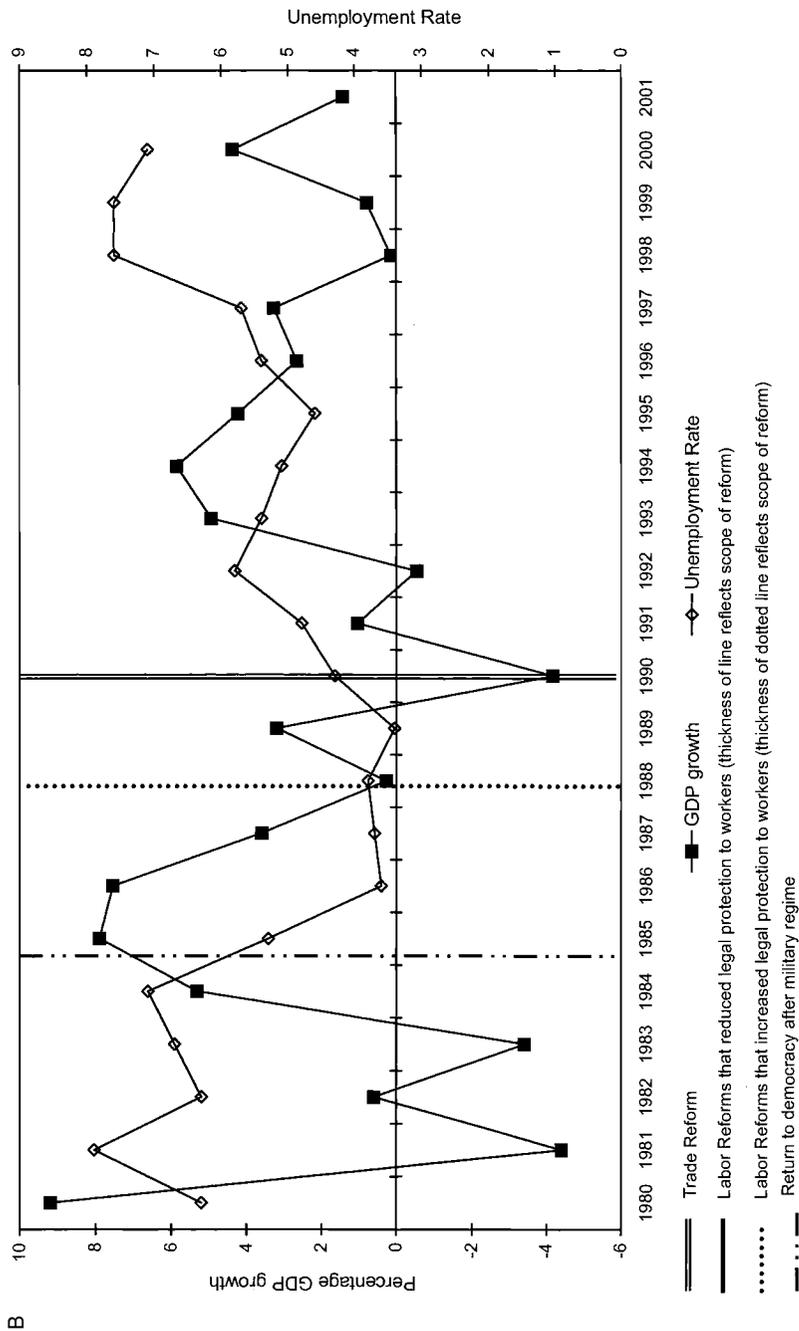
protection of workers occurred in the context of a transition to democracy. In all of these episodes it could be argued that labor reforms were exogenous to the economic system because they were driven either by a new economic philosophy or by profound transformations in political regimes, although one could counter that these political transitions were facilitated by economic developments. Some reforms and transformations are clearly driven by changes in economic activity. There is evidence that many reforms tend to occur around periods of negative economic growth. In the countries and periods analyzed in this volume, there have been at least fifteen episodes of reform. Out of these fifteen, six episodes of reform occurred in years in which GDP had declined the year before. However, four of those reforms increased the legal protection to workers, and two liberalized the labor market.

Overall, there is no empirical relationship between labor reforms and labor market outcomes driven by economic performance. Our cross-country



**Fig. 3 Economic and trade labor reforms: A, Argentina; B, Brazil; C, Chile; D, Colombia; E, Peru; F, Uruguay; G, Barbados; H, Jamaica; I, Trinidad and Tobago**

Sources: GDP growth rate from World Bank Development Indicators (2000), unemployment rates from ECLAC (2001) and ILO (2002), Period of trade reforms from IADB (1996), year of end of military regime from Nohlen (1993).



**Fig. 3 (cont.) Economic and trade labor reforms: A, Argentina; B, Brazil; C, Chile; D, Colombia; E, Peru; F, Uruguay; G, Barbados; H, Jamaica; I, Trinidad and Tobago**

Sources: GDP growth rate from World Bank Development Indicators (2000), unemployment rates from ECLAC (2001) and ILO (2002), Period of trade reforms from IADB (1996), year of end of military regime from Nohlen (1993).

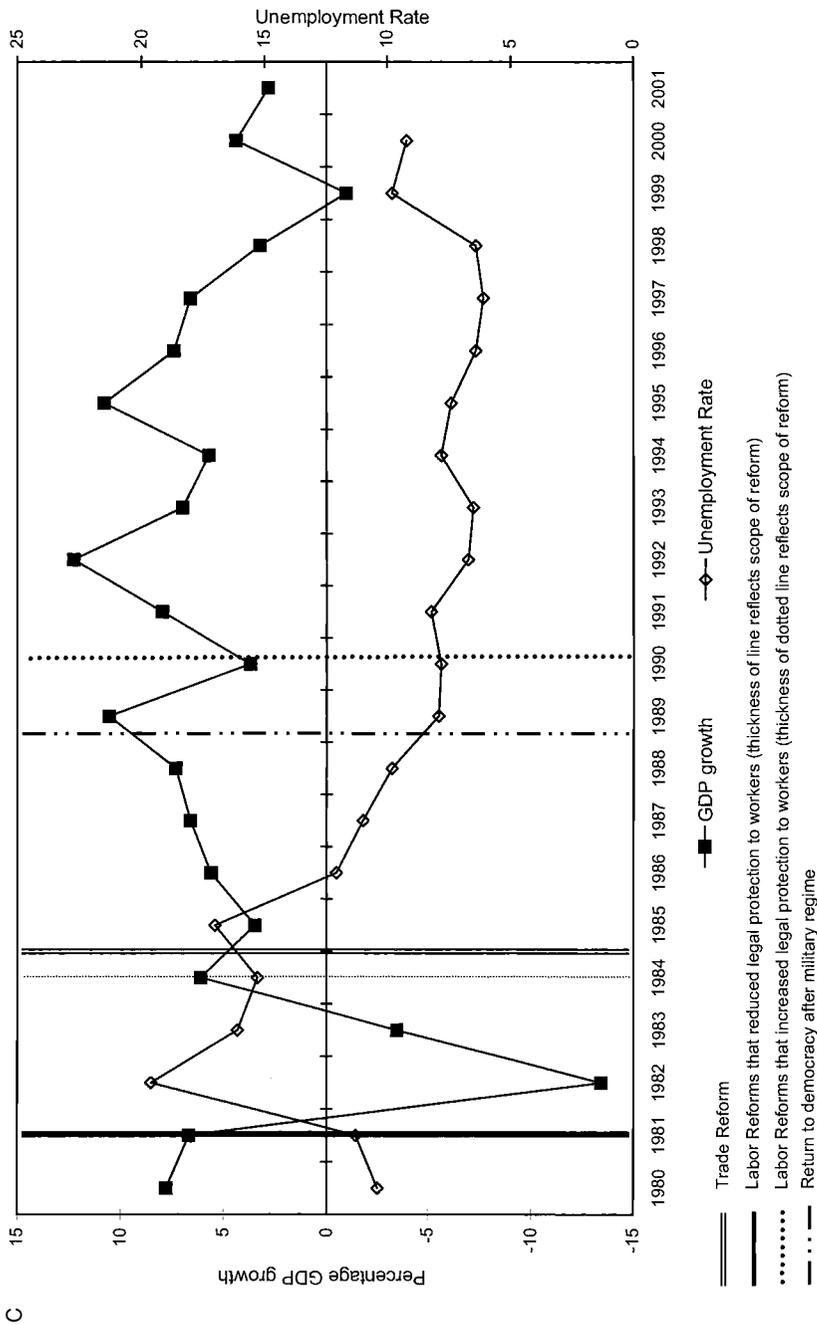
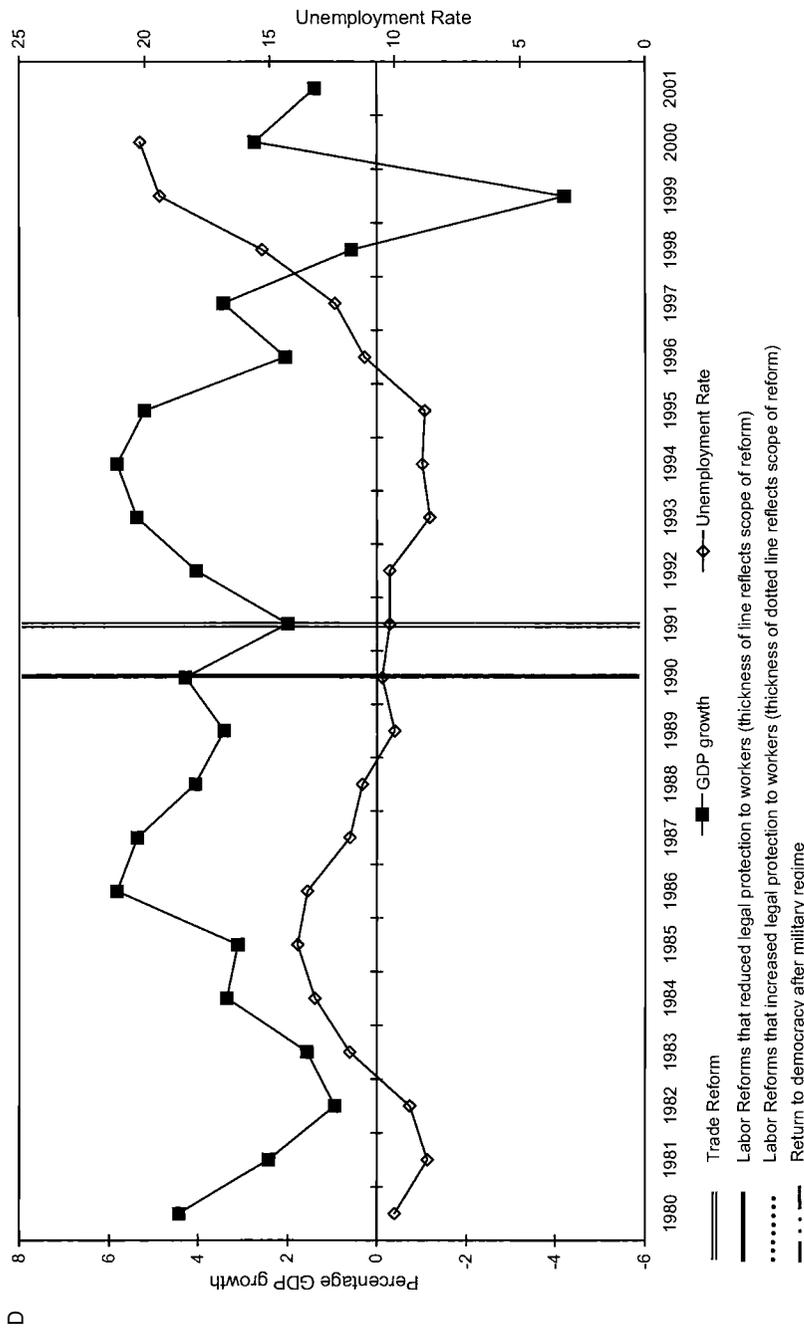


Fig. 3 (cont.)



**Fig. 3 (cont.) Economic and trade labor reforms: A, Argentina; B, Brazil; C, Chile; D, Colombia; E, Peru; F, Uruguay; G, Barbados; H, Jamaica; I, Trinidad and Tobago**

Sources: GDP growth rate from World Bank Development Indicators (2000), unemployment rates from ECLAC (2001) and ILO (2002), Period of trade reforms from IADB (1996), year of end of military regime from Nohlen (1993).

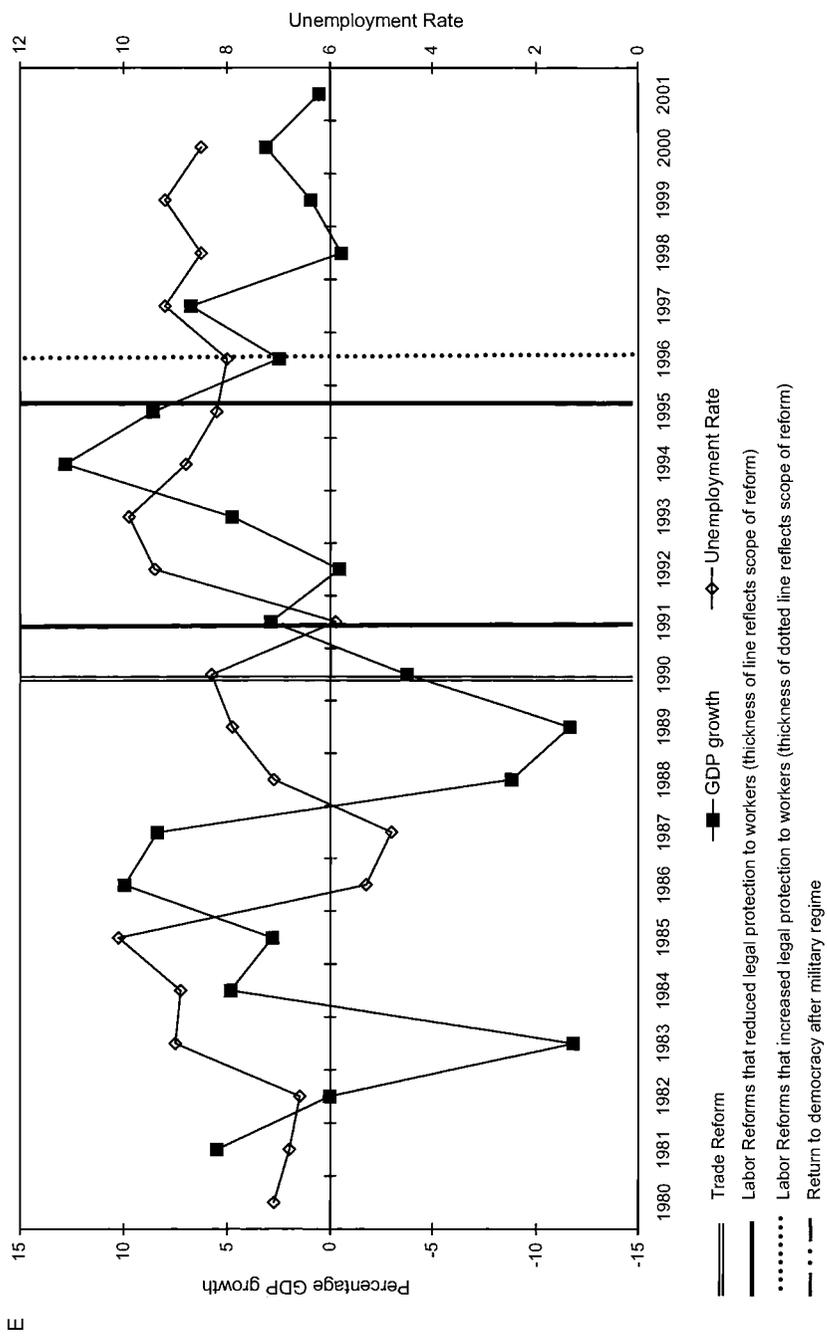
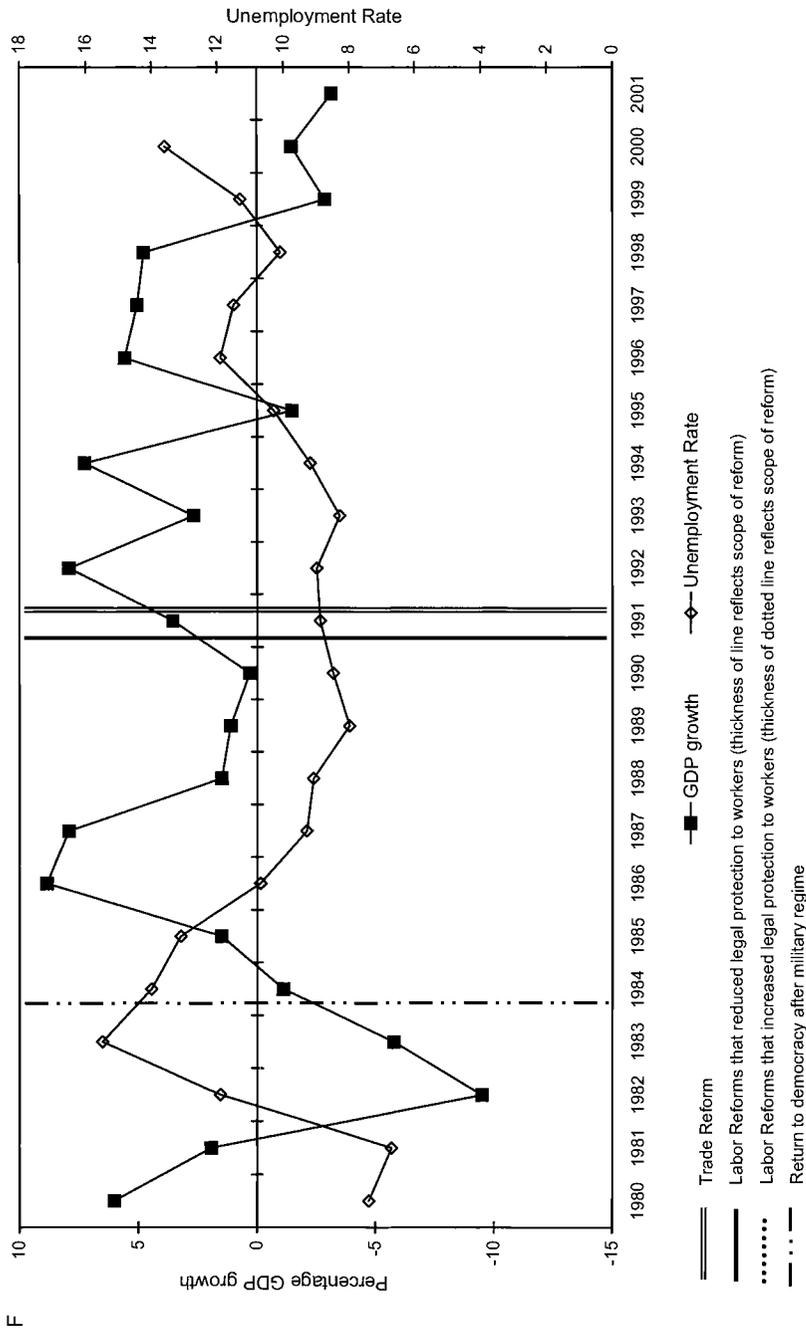


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**Fig. 3 (cont.) Economic and trade labor reforms: A, Argentina; B, Brazil; C, Chile; D, Colombia; E, Peru; F, Uruguay; G, Barbados; H, Jamaica; I, Trinidad and Tobago**  
 Sources: GDP growth rate from World Bank Development Indicators (2000), unemployment rates from ECLAC (2001) and ILO (2002), Period of trade reforms from IADB (1996), year of end of military regime from Nohlen (1993).

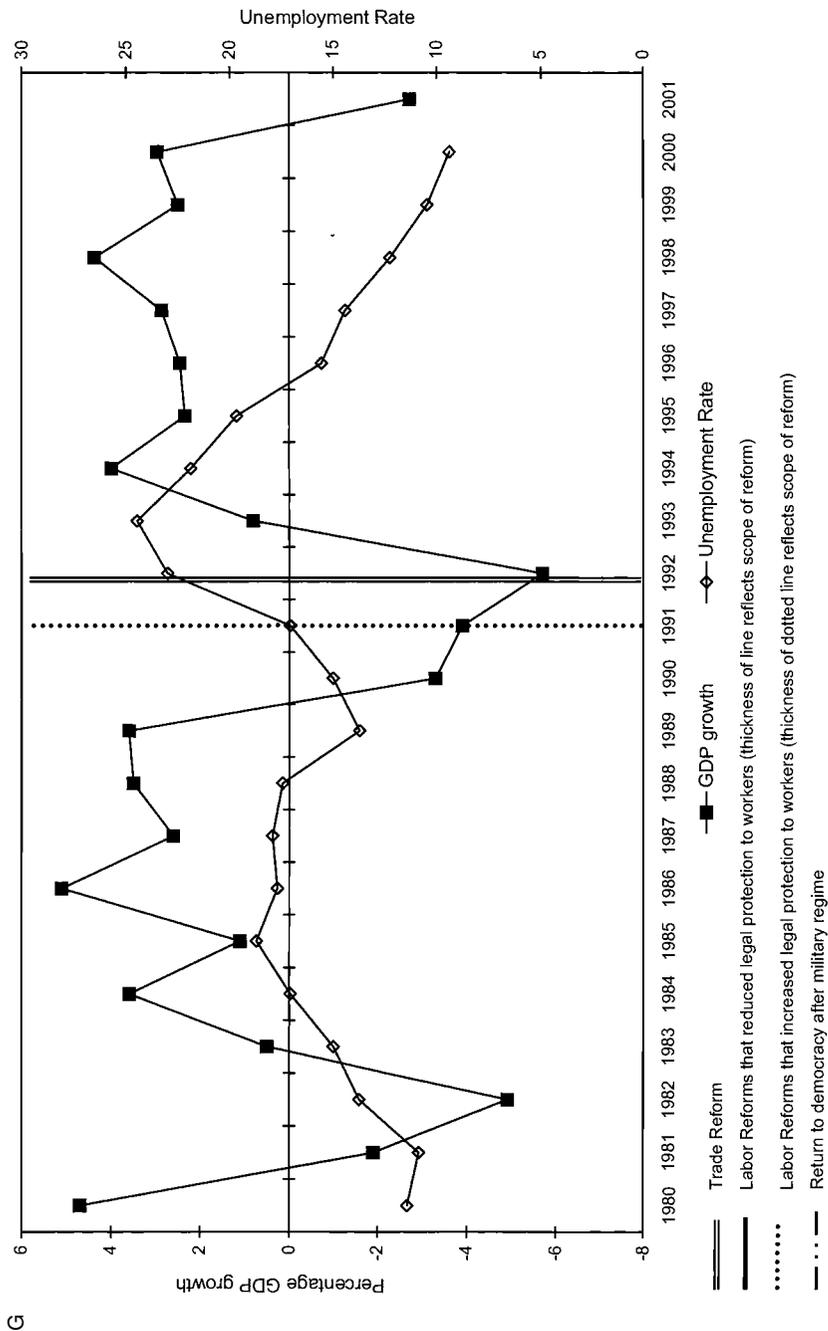
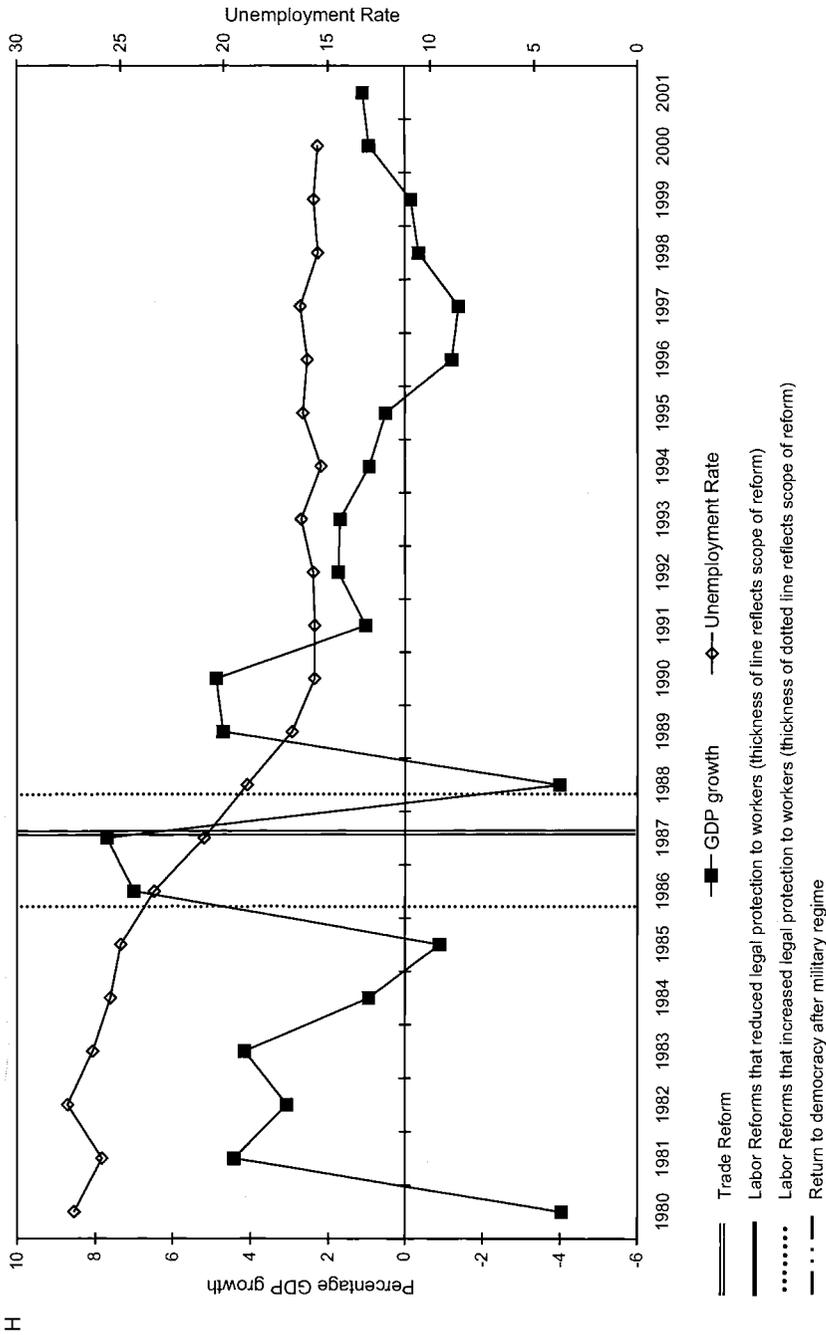


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**Fig. 3 (cont.) Economic and trade labor reforms: A, Argentina; B, Brazil; C, Chile; D, Colombia; E, Peru; F, Uruguay; G, Barbados; H, Jamaica; I, Trinidad and Tobago**

Sources: GDP growth rate from World Bank Development Indicators (2000), unemployment rates from ECLAC (2001) and ILO (2002), Period of trade reforms from IADB (1996), year of end of military regime from Nohlen (1993).

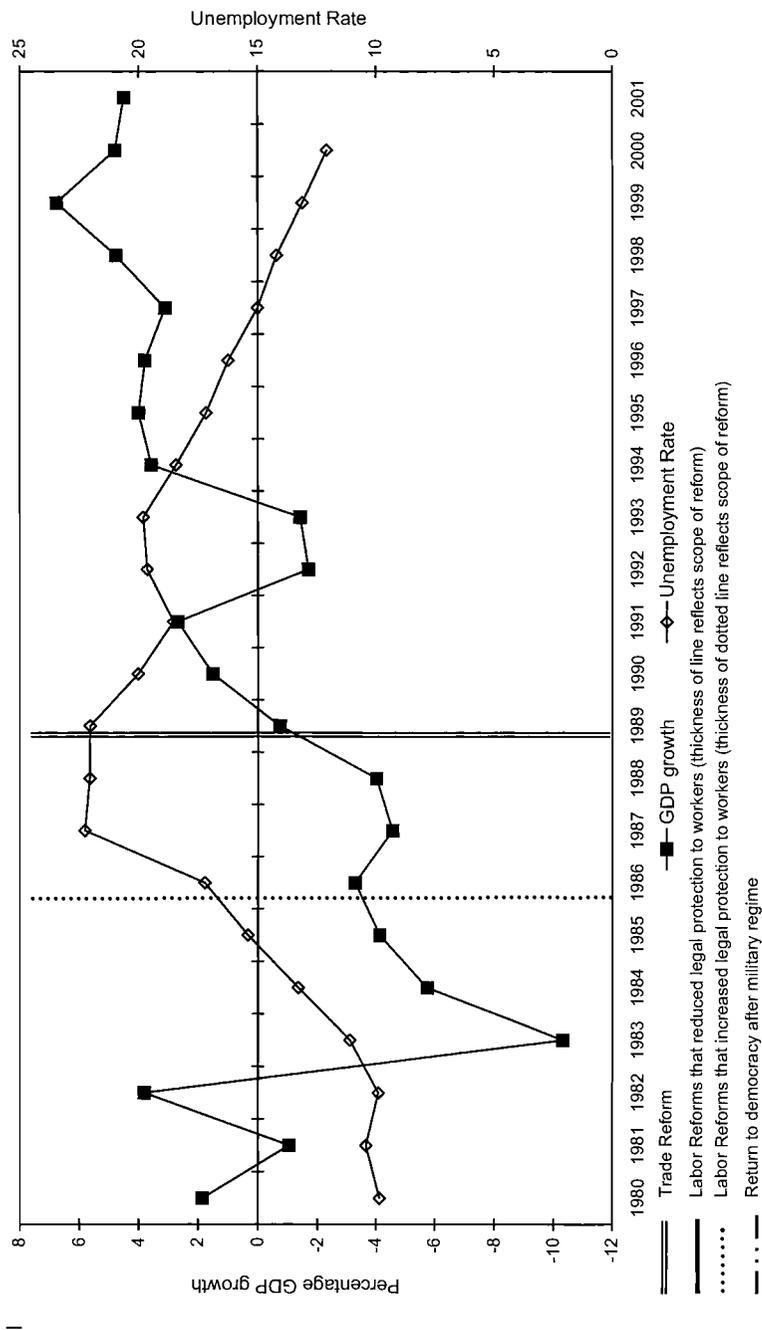


Fig. 3 (cont.)

time series analysis presented in this chapter controls for present and past levels of economic activity to account for the possibility of endogeneity. The disaggregated studies use year effects and other strategies to control for endogeneity.

### I.3.6 Quantifying the Cost of Regulation

This section constructs measures of labor laws that can be compared across countries and time (see also Heckman and Pagés 2000). Many studies that summarize institutional data across countries construct qualitative indices that rank variables across countries. For instance, Grubb and Wells (1993) construct a series of indicators of employment protection by ranking different aspects of job protection across countries and averaging these different rankings in one summary indicator. Although such measures summarize many complex institutional features, they are not comparable over time. A second group of studies constructs measures that aggregate institutional aspects of the labor market by assigning to each country and year a value in a certain range, for instance, between zero and one. These measures summarize a large number of interesting aspects and are comparable across time. However, they can also be quite arbitrary because it is difficult to justify any assigned numerical values for qualitative variables, and because it is difficult to compare one measure against another. Moreover, the measures are very sensitive to the weights assigned to the different components of these measures. From a policy standpoint, summarizing many features of a regulatory system in one indicator makes it impossible to distinguish which components, if any, have an adverse effect on employment.

We take a different route by constructing measures of the direct cost (measured as a fraction of average monthly wages) of complying with labor laws. These measures can be compared not only across countries and over time, but they can also be compared against each other. This allows us to quantify, for instance, the share of the total costs given by each type of regulation. Our measure of mandatory total costs (TC) of regulations is

$$TC = SSP + JS.$$

It is the sum of the cost of social security payments (SSP) plus the cost of abiding by job security provisions (JS). These costs are expressed as fractions of the average monthly wage.

This measure of the cost of regulation omits some important components of labor cost. For example, the costs of abiding by certain laws are hard to quantify and are omitted. One example of laws whose costs are difficult to quantify is the prohibition against dismissing workers in bad times. In addition, this measure does not include the cost of regulating the length of the standard workweek and overtime work. It does not include the cost of complying with minimum wage laws or other income floors. We do not include regulations on temporary labor contracts. Although these

regulations are likely to have effects on employment and unemployment, we choose to exclude them because comparable data on the share of the labor force affected by these regulations across time and countries are difficult to obtain. We leave the quantification of these features of regulations for future work.

There is one major conceptual problem with this index. It does not distinguish between static and dynamic aspects of the cost of labor. Job security affects both components of costs by raising the total cost of labor and by increasing the cost of adjusting labor. Social security costs affect the unit cost of labor without affecting dynamic costs of labor. Our index of total cost is not a measure of the price of labor facing firms at different stages of the business cycle. We develop this point below and in appendix B.

### *Quantifying Job Security Provisions*

Our index includes, in job security legislation, those provisions of the law that increase the cost of dismissing a worker for economic reasons.<sup>9</sup> Across countries, termination laws require firms to incur at least five types of costs: administrative procedures, advance notification, indemnities for dismissal, seniority pay, and the legal costs of a trial if workers contest dismissals. Administrative procedures require the firm to notify and seek approval by labor unions or the Ministry of Labor to extend the period between layoff decisions and the actual occurrence of layoffs. They may also involve long negotiations to place workers in alternative jobs. The period of advance notification should also be included in the computation of labor costs because in many countries, laws allow firms to choose between providing advance notice or paying a compensation equivalent to the wages for the corresponding period. Moreover, since productivity declines substantially after notice, advance notification should be considered as a part of dismissal costs even when firms choose to notify workers in advance. Therefore, we assume that employees do not work at full productivity levels after notification.<sup>10</sup> In most countries, mandatory advance notice periods increase with tenure, and in others they are higher for white-collar than for blue-collar workers.

Most Latin American and OECD countries mandate indemnities in cases of firm-initiated dismissal. In general, indemnities are based on multiples of the most recent wage and the years of service. Some countries calculate the amount of mandatory indemnities based on whether the dismissal is deemed just or unjust or whether the worker is blue collar or white

9. In most countries, the law does not mandate compensation for dismissal if the separation is due to employees' misdemeanors. However, if such behavior cannot be proved, the worker has to be compensated at the regular legal rate.

10. There is some evidence that advance notice stimulates on-the-job search during the notification period (Addison and Portugal 1992), which suggests a reduction in the effort devoted to work.

collar. In contrast, seniority pay is only mandated in a few Latin American countries in which the law requires employers to make a payment upon termination of the work relationship, regardless of the cause or party initiating the separation. In these countries, firms initiating dismissal are required to pay both indemnities *and* seniority pay. In some countries, this payment is deposited as a regular contribution to the worker's individual savings account. In these countries, workers can withdraw principal and interest from their account upon separation. In other countries, seniority pay is determined as a given amount that has to be paid to the worker upon termination of the work relationship.<sup>11</sup> Finally, firms can incur considerable additional costs if workers contest dismissal in courts. If judges rule in favor of workers, firms not only have to pay indemnities, but also the workers' foregone wages during trial.

To compute the monetary cost of labor laws, we improve on the job security measures developed in Heckman and Pagés (2000) in three ways. First, we expand our previous database to include the 1980s in all OECD countries. This expansion of the data set allows us to capture some additional labor reforms in OECD countries not previously captured. Second, we revise and correct some of our previous data on advance notice and indemnities for a number of countries to better capture the actual cost of the law (see appendix A for a complete description of the methodology and assumptions involved). Finally, we include the cost of seniority pay in our measure of job security, which we did not include in our previous work.

Our measure of the cost of job security,  $JS_{jt}$ , for country  $j$  at time  $t$  is constructed from the following formula:

$$\begin{aligned}
 (1) \quad JS_{jt} &= \sum_{i=1}^T \beta^i \delta^{i-1} (1 - \delta) (b_{j,t+i}) \\
 &\quad + \sum_{i=1}^T \beta^i \delta^{i-1} (1 - \delta) [a_j \cdot y_{j,t+i}^{jc} + (1 - a_j) \cdot y_{j,t+i}^{uc}] + \sum_{i=0}^T \beta^i c_{j,t+i} \\
 &= AN_{j,t} + ID_{j,t} + SenP_{j,t},
 \end{aligned}$$

where  $\delta$  is the probability of a worker remaining in a job in a period,  $\beta$  is the discount factor,  $i$  denotes tenure at the firm, and  $T$  is the maximum tenure that a worker can attain in a firm, which is assumed to be twenty years ( $T = 20$ ). The expression is broken down into three terms corresponding to advanced notice costs ( $AN_{j,t}$ ), indemnity costs ( $ID_{j,t}$ ), and seniority pay ( $SenP_{j,t}$ ). The first term in expression (1) is the discounted cost of future advance notice, weighted by the probability that a worker will be dismissed, after one, two, three, and so on periods at the firm, where  $b_{j,t+i}$  is the advance notice to a worker who has been  $i$  years at a firm measured in

11. For an extensive description of job security measures, see OECD (1993, 1999) for OECD countries and IADB (1996) for Latin America.

monthly wages. The second term in expression (1) is the discounted cost of future indemnities, weighted by the probability of dismissal after  $i$  periods at the firm. In this expression,  $a_j$  denotes the probability that the economic difficulties of the firm are considered a just cause of dismissal, while  $y_{j,t+i}^{jc}$  ( $y_{j,t+i}^{uc}$ ) is the mandated indemnity in case of just cause (unjust cause) dismissal, again measured in monthly wages. Finally, the third term in expression (1) captures the cost of seniority pay, and  $c_{j,t+i}$  denotes contributions to a worker's savings account measured in monthly wages.<sup>12</sup> We assume a common discount and dismissal rate of 8 and 12 percent, respectively, across countries. The choice of the discount rate is based on the historical returns of an internationally diversified portfolio. Our choice of the turnover rate is motivated by the concern that turnover rates are affected by the legislation in countries with job security provisions and by the lack of the turnover data for most countries of the sample. We use a benchmark turnover rate from the United States, a country with lower job security costs than any country in our LAC sample. Evidence on turnover rates for Latin America is scant. However, evidence for a few countries for which job reallocation rates can be computed suggest that turnover rates in Latin America are within the ranges observed in the United States and other developed countries (Inter-American Development Bank [IADB] 2004). The choice of this benchmark is clearly a rough way to avoid endogeneity problems. To assign values to the discounted future payments of advance notice, indemnities and seniority pay, we use the information contained in tables A.1 and A.2 in appendix A. When regulations mandate different provisions for white-collar and blue-collar workers, we take the unweighted average for the two types of workers.

By construction, our job security measures give a higher weight to dismissal costs that may arise soon after a worker is hired because they are discounted less at the time of hiring, while they discount more firing costs that arise further in the future. Our measure captures the expected average cost. Consequently, it does not measure the true marginal labor cost, which is state contingent, nor does it distinguish dynamic from static costs, as we have previously noted. We discuss these issues further in appendix B.

### *Quantifying the Cost of Social Security*

To quantify the cost of social security regulations and payroll taxation, we gather data on mandatory payroll contributions to old age, disability and death, sickness and maternity, work injury, unemployment insurance, and family allowances programs. Because the nominal incidence of the contributions (whether they fall on the employer or the employee) is irrel-

12. In two countries, the law mandates seniority pay, but this is not capitalized in individual savings accounts. See appendix A for a description of this case.

evant in measuring total social cost (although it is not irrelevant for the study of labor demand), we add both contributions as a percentage of wages. To quantify the cost of social security provisions in a way that is comparable to the cost of job security, we compute the expected cost of social security provisions (SSP) at the time of hiring as

$$SSP_{jt} = \sum_{i=0}^T \beta^i (ss_{j,t+i}^e + ss_{j,t+i}^w),$$

where  $ss_{j,t+i}^e$  and  $ss_{j,t+i}^w$  are, respectively, the costs of payroll taxes paid by the employer and the worker expressed as a percent of wages, and  $\beta$  is the discount rate.<sup>13</sup>

### 1.3.7 The Cost of Labor Laws across Countries

Table 3 summarizes our measures of the cost associated with different labor regulation regimes. In the first three columns, we summarize the cost of abiding by employment protection laws at the end of the 1990s. We generate these indices for all countries in all years for which we have data. Table 3 only reports those values for the last year of our sample. Column (1) summarizes the cost of giving advance notice to workers. In the Latin American countries, the typical required advance notice is a month or the equivalent to 0.63 monthly wages in expected value terms. Bolivia stands out as the country that requires one of the longer advance notice periods (1.77 months in expected terms), while Peru and Uruguay require no advance notice. Mandatory advance notice provisions tend to be more stringent in OECD countries. Many OECD countries mandate fairly long advance notice periods, particularly for skilled workers. In addition, in most countries, advance notice periods increase with seniority. In Belgium, for instance, the mandatory advance notice for skilled workers with ten years of seniority is nine months, while for workers with twenty years of seniority it is fifteen months. In Sweden, all workers with ten years of seniority are entitled to an advance notice period of five months, whereas for a worker with twenty years of seniority, the mandatory advance notice period is six months. The fact that Belgium and Sweden have very similar values in table 3 reflects the fact that in Belgium very high advance notice only applies to skilled workers, whereas in Sweden it applies to all workers. It also reflects the fact that our measure heavily discounts costs that are expected to occur far in the future. On average, mandated advance notice periods are significantly longer in OECD countries than in the LAC sample.

The second column displays the cost of indemnities for dismissal. Within the LAC sample, Colombia, Peru, Ecuador, Bolivia, El Salvador, and

13. We obtain the information on these contributions from the series *Social Security Programs Throughout the World*, edited by the United States Social Security Administration (1983–1999).

Table 3 Measures of Labor Market Regulations (end of 1990s)

Country	Year (1)	Advance Notice (EPV) (2)	Indemnities for Dismissal (EPV) (3)	Seniority Pay (EPV) (4)	Social Security Contributions (EPV) (1) + (2) + (3) + (4)	Total Cost (EPV)	Social Security Contributions as % of Total Costs	Social Security Contributions (% wage)
Australia	1999	0.73	0.99	0.00	1.95	3.67	53.04	0.02
Austria	1999	0.85	0.94	0.00	58.29	60.07	97.03	0.45
Belgium	1999	1.73	0.00	0.00	40.17	41.89	95.87	0.31
Canada	1999	0.60	0.19	0.00	18.56	19.35	95.93	0.14
Denmark	1999	1.73	0.04	0.00	n.a.	1.77	—	—
Finland	1999	1.61	0.00	0.00	35.62	37.23	95.67	0.27
France	1999	0.98	0.36	0.00	64.77	66.11	97.97	0.50
Germany	1999	1.14	0.00	0.00	53.48	54.63	97.91	0.41
Greece	1999	0.00	1.34	0.00	46.54	47.88	97.20	0.36
Hungary	1999	0.87	0.73	0.00	65.56	67.15	97.63	0.51
Ireland	1999	0.45	0.58	0.00	24.67	25.70	95.99	0.19
Italy	1999	0.60	2.63	0.00	91.53	94.76	96.60	0.71
Japan	1999	0.59	0.00	0.00	36.36	36.95	98.40	0.28
Korea	1999	0.59	2.99	0.00	18.08	21.66	83.49	0.14
The Netherlands	1999	0.88	0.00	0.00	84.99	85.87	98.97	0.65
New Zealand	1999	0.22	0.00	0.00	0.00	0.22	0.00	0.00
Norway	1999	0.88	0.00	0.00	28.43	29.31	97.00	0.22
Poland	1999	1.22	0.00	0.00	60.48	61.70	98.02	0.47
Portugal	1999	1.18	3.30	0.00	49.01	53.49	91.63	0.38
Spain	1999	0.59	2.58	0.00	49.43	52.60	93.98	0.38
Sweden	1999	1.79	0.00	0.00	28.86	30.65	94.16	0.22
Switzerland	1999	1.25	0.00	0.00	19.26	20.51	93.92	0.15
Turkey	1999	0.99	2.99	0.00	44.79	48.76	91.85	0.35
United Kingdom	1999	0.71	0.72	0.00	28.82	30.25	95.27	0.22
United States	1999	0.00	0.00	0.00	23.56	23.56	100.00	0.18
Average OECD	1999	0.89	0.82	0.00	40.55	42.25	95.97	0.31

(continued)

Table 3 (continued)

Country	Year (1)	Advance Notice (EPV) (2)	Indemnities for Dismissal (EPV) (3)	Seniority Pay (EPV) (4)	Social Security Contributions (EPV) (1) + (2) + (3) + (4)	Total Cost (EPV)	Social Security Contributions as % of Total Costs	Social Security Contributions (% wage)
Argentina	1999	0.80	2.20	0.00	44.49	47.48	93.69	0.34
Bolivia	1999	1.77	2.99	0.00	31.16	35.91	86.76	0.24
Brazil	1999	0.59	2.45	9.82	37.65	50.51	74.53	0.29
Chile	1999	0.59	2.79	0.00	27.20	30.58	88.95	0.21
Colombia	1999	0.30	3.49	9.82	38.75	52.35	74.01	0.30
Costa Rica	1999	1.05	2.60	0.00	35.05	38.69	90.58	0.27
Dominican Rep.	1999	0.59	2.16	0.00	16.23	18.97	85.52	0.13
Ecuador	1999	0.59	3.30	9.82	22.85	36.56	62.50	0.18
El Salvador	1999	0.06	2.99	0.00	27.26	30.31	89.94	0.21
Honduras	1999	0.59	2.94	0.00	13.63	17.16	79.43	0.11
Jamaica	1999	0.59	1.41	0.00	6.49	8.49	76.47	0.05
Mexico	1999	0.59	2.57	0.00	29.50	32.66	90.33	0.23
Nicaragua	1999	0.59	1.97	0.00	19.47	22.04	88.37	0.15
Panama	1999	0.59	2.09	0.75	15.19	18.62	81.58	0.12
Paraguay	1999	0.68	1.49	0.00	27.26	29.43	92.63	0.21
Peru	1999	0.00	3.80	9.82	27.26	40.88	66.69	0.21
Trinidad and Tobago	1999	1.18	1.33	0.00	10.90	13.41	81.31	0.08
Uruguay	1999	0.00	2.23	0.00	52.58	54.81	95.93	0.41
Venezuela	1999	0.93	2.03	5.97	18.43	27.36	67.37	0.14
Average Latin America		0.63	2.46	2.42	26.39	31.91	82.45	0.20

Source: Authors' calculations based on OECD (1999), Grubbs and Wells (1993), U.S. Social Security Administration (1983–1999), and Ministries of Labor in Latin America and the Caribbean.

Note: EPV denotes Expected Present Discounted Value. Dashes indicate missing value.

Honduras stand out as countries where the cost of abiding by these regulations is the highest. In the sample of OECD countries, Portugal, Turkey, Korea, Italy, and Spain are the ones where indemnities for dismissal laws are more costly (in terms of expected monthly wages), while a number of countries, including Belgium, Finland, Germany, Japan, Netherlands, New Zealand, Norway, Poland, Sweden, Switzerland, and the United States do not mandate indemnities for dismissal. Comparing the two regional samples, it is clear that, on average, compensation for dismissal is three times larger in LAC than in the OECD countries, despite the much lower level of income in the LAC region.

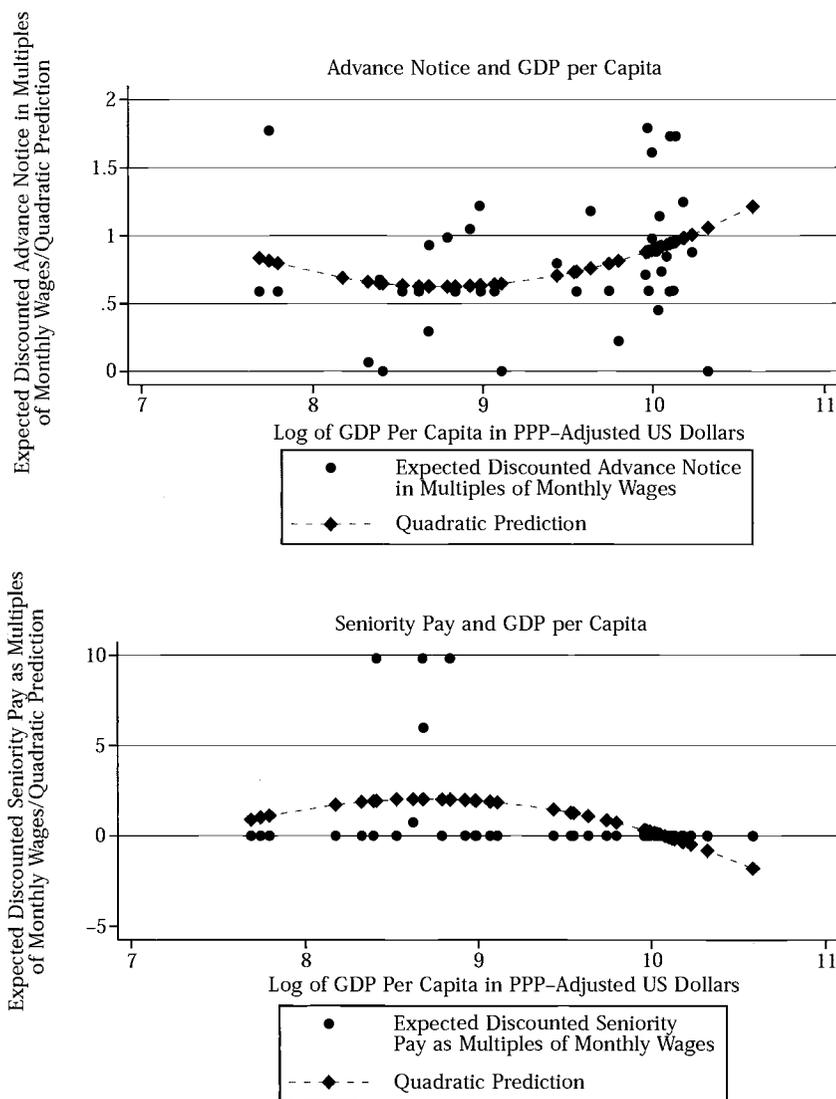
The third column refers to seniority pay. This additional payment is mandatory in only six Latin American countries, but the estimated expected discounted costs are large when this feature is present. In Colombia, Brazil, Ecuador, and Peru, employers are required to deposit about one month of pay every year to workers' individual savings accounts. Over the life of a worker, this provision is expected to cost about ten monthly wages in these four countries. Once advance notice, compensation for dismissal, and severance pay are added, we find that the cost of job security provisions is much higher in the poorer LAC region than in the richer OECD sample.

The fourth column reports the expected costs of complying with social security laws. Compared to the costs of employment security, social security costs are very large and therefore constitute the lion's share of the total costs of labor laws. In Argentina, for example, expected discounted costs of social security are 44.5 months of pay, while in many OECD countries these costs are even larger. In the average Latin American country, social security payments amount to 82 percent of the total costs of labor laws. This percentage is even larger in OECD countries where, on average, they reach 96 percent of the total regulatory costs.

Once all the costs are aggregated, labor laws impose a much larger cost in OECD countries. However, the composition of these costs is quite different. While the typical Latin American country mandates shorter advance notice periods and lower social security contributions than the average OECD country, job security provisions are substantially higher in LAC.

Latin American and Caribbean countries have a higher burden of regulations that affect adjustment processes in the labor market. European countries have a higher burden of payroll taxation that affects labor demand but not labor adjustment. Both regions have a much higher burden of labor costs than North America.

Exploring the relationship between income per capita and social protection across countries, it is clear that job security provisions are strategies of low-income regions. Figure 4 graphs regression relationships for each of our measures of labor cost on GDP per capita (PPP adjusted) and GDP squared. Across countries, advance notice costs tend to increase with income; seniority pay and indemnities for dismissal decline with country in-



**Fig. 4 Labor regulations and GDP per capita**

*Sources:* Authors' calculations based on labor force statistics, OECD; World Bank (2000); and Ministries of Labor in Latin America and the Caribbean.

come. Social security contributions follow an inverted U-shape pattern in income. They tend to increase with income in the Latin American sample and reach a maximum in medium-income countries, while they tend to decline with income within the sample of upper-income countries. Regulation is an inferior good. It is the response of poor countries to the demand for worker security. By imposing a mandate on firms, central governments

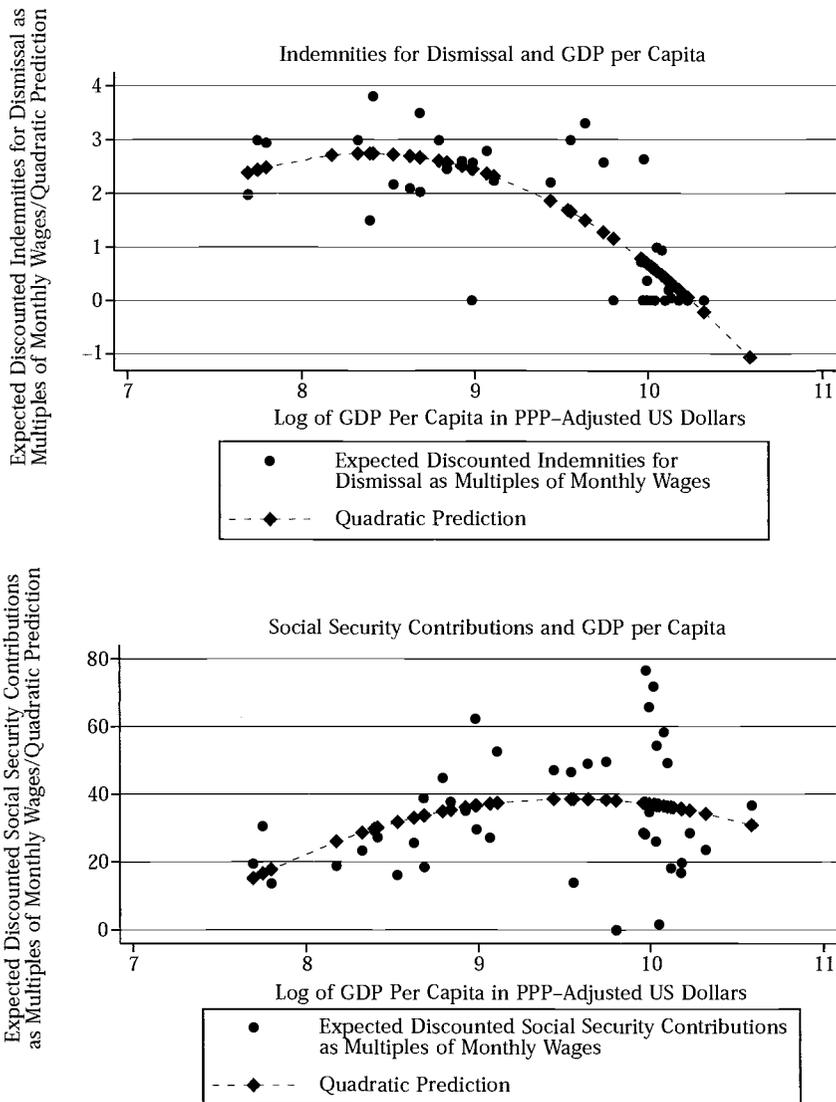


Fig. 4 (cont.)

avoid the direct fiscal cost of financing social safety nets, albeit at the cost of affecting their labor market performance.

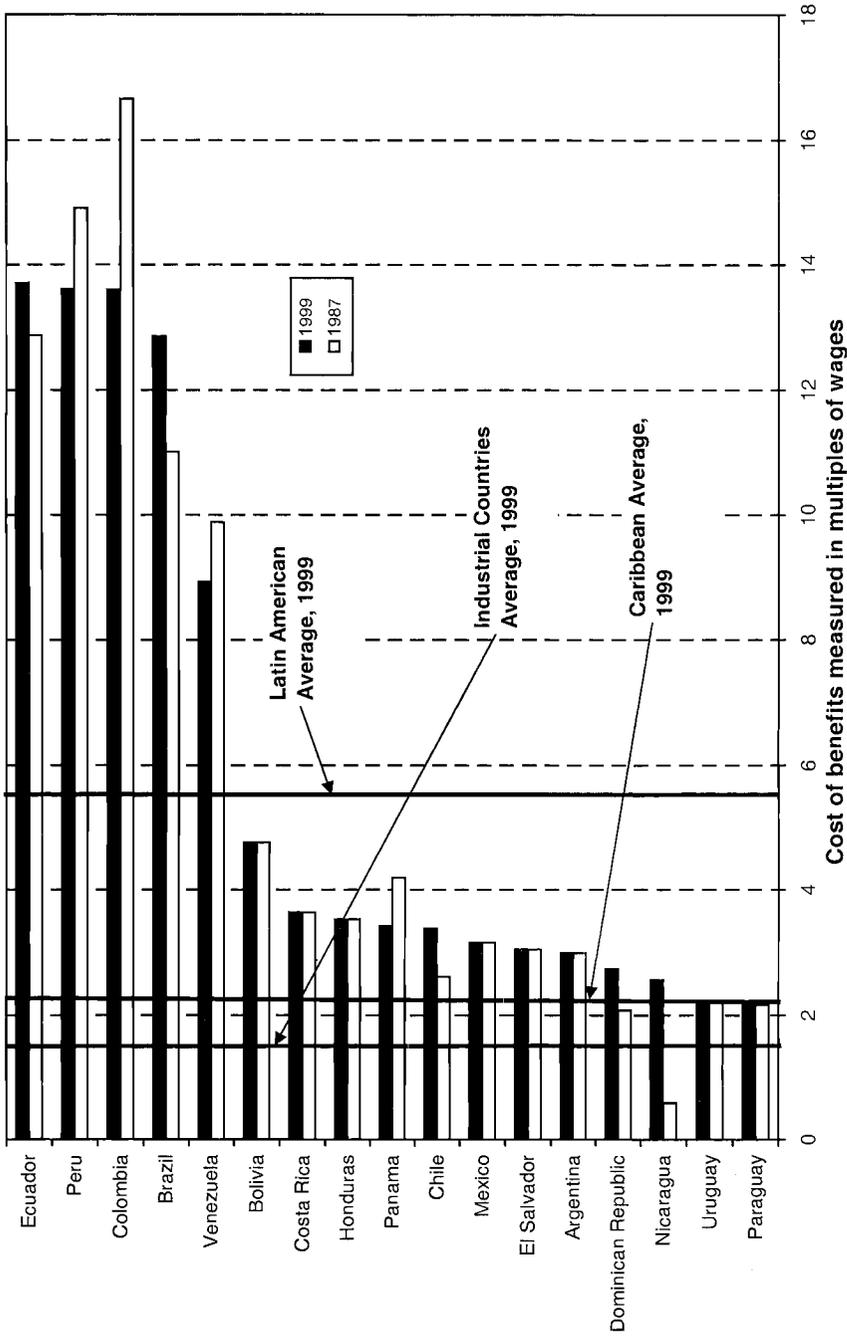
We next examine the evolution of these measures over time. Since the early 1980s there have been few reforms in job security provisions in Latin America and even fewer in OECD countries. Social security contributions have changed more, but even they seldom change drastically. This lack of variability, particularly in job security provisions, poses a challenge for em-

pirical studies of the impact of regulations. Figure 5 shows the level and the changes in job security since the late 1980s across Latin American countries. The general view that there have been important reductions in dismissal costs in Latin America is not accurate once we aggregate across all components of job security. Only Colombia, Panama, Peru, and Venezuela have experienced a reduction in the costs of terminating indefinite contracts. In Venezuela and Panama, the reduction in indemnities has been partly offset by increases in the costs of severance pay. Our measures reveal that Brazil, the Dominican Republic, Chile, and Nicaragua undertook reforms that increased the cost of dismissal. Assembling Latin American and OECD events, there are thirteen episodes in which job security provisions were changed. Nine of these episodes occurred in Latin America, and four occurred in the OECD sample. Figure 6 shows the percentage change in advance notice and indemnities for dismissal in the countries that have experienced reforms. It makes clear that changes in job security costs have been substantial in Latin America relative to the OECD sample. The enormous variation in the Latin American region and the exogeneity of some of the reforms is the reason why we think that the study of Latin American labor markets can inform further analyses of the impacts of regulation in economies around the world.

Figure 7 reports social security contributions (measured in expected discounted cost terms) at the beginning and at the end of the 1990s for Latin American countries. There have been important changes during the last decade. In many countries, social security contributions increased during the 1990s as a consequence of pension reforms and population aging. Yet, in some countries, most significantly in Argentina, social security contributions were reduced during the decade.

### 1.3.8 Enforcement and Informality

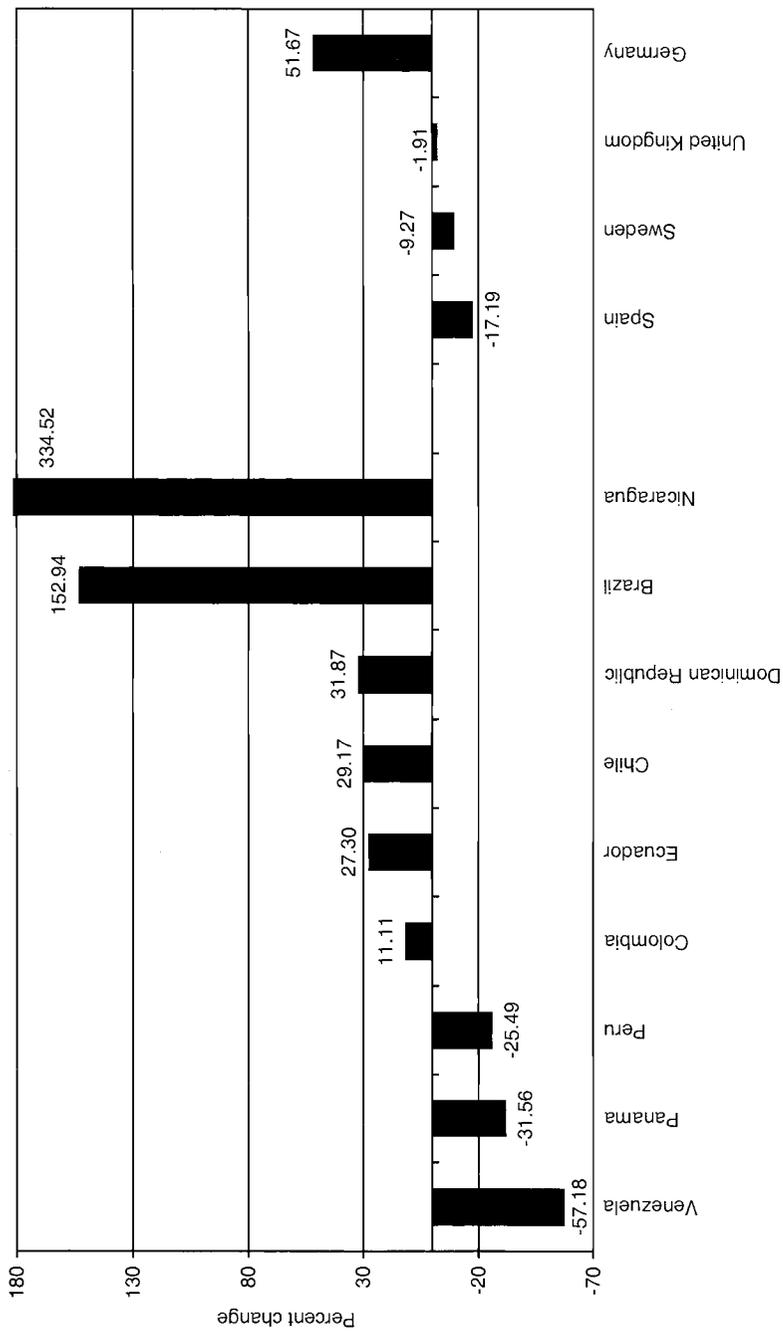
The measures summarized in table 3 calculate *de jure* cost of regulations, assuming that firms and workers abide by the text of the law. In practice, however, enforcement is at best weak, and many workers end up not being covered by mandatory regulations. Such workers are often referred to as informal workers. Given the difficulties in measuring the extent of informality, different approaches have been followed in the literature. Some authors follow the traditional ILO approach of classifying as informal those workers who are either self-employed, work for firms with five or less employees, work as unpaid family help, or are employed as domestic workers. Although some of these workers may be receiving the benefits prescribed by the law, there tends to be a high correlation between being in any of these categories of employment and not being covered by labor laws. Other authors use a more direct measure of informality, computing the percentage of workers who are affiliated with social security programs or have a formal labor contract. All authors in this volume use a “benefits” definition of



**Fig. 5 The cost of job security: End of the 1980s relative to end of the 1990s**

Source: Ministries of Labor of Latin America and the Caribbean.

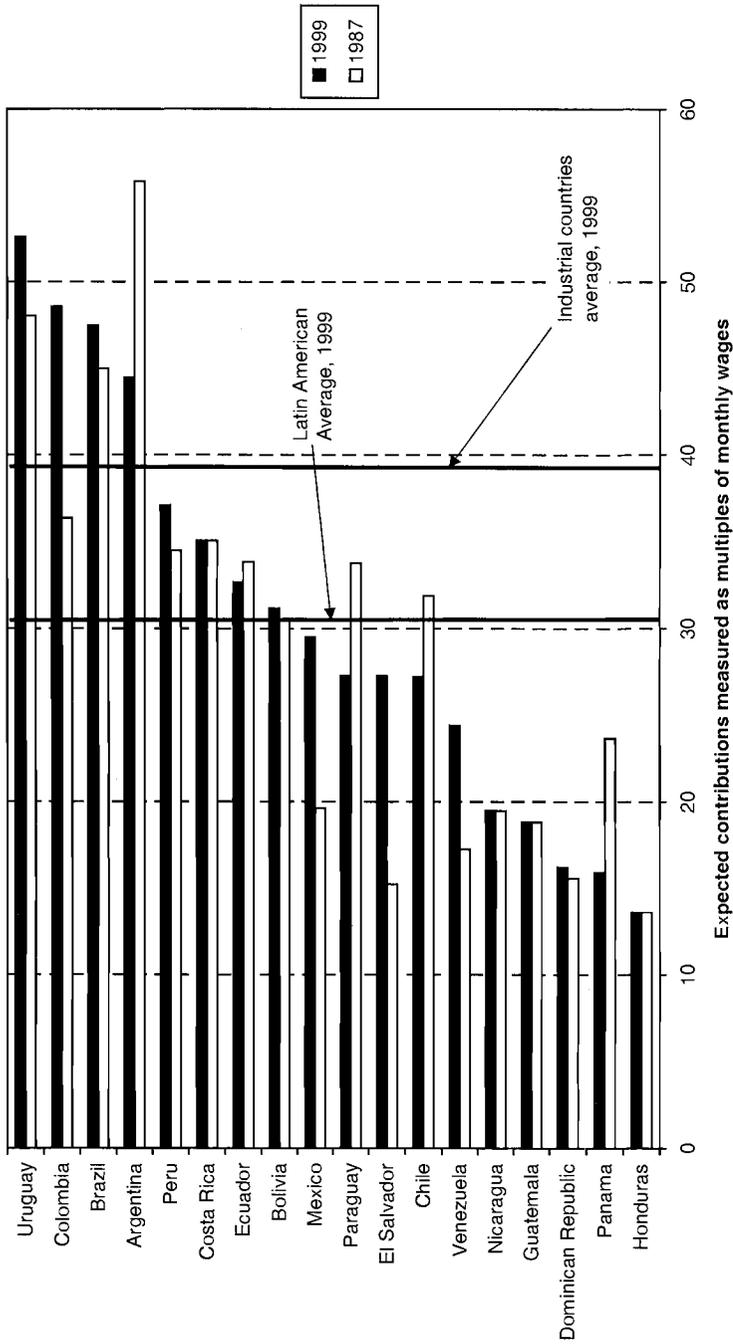
Note: Cost of job security includes advance notice + indemnities for dismissal + seniority pay.



**Fig. 6 Percent change in advance notice and indemnities for dismissal: 1990s relative to 1980s**

*Source:* Ministries of Labor in Latin America and the Caribbean.

*Note:* Percentage change of the cost of providing advance notice and indemnities for dismissal as a consequence of labor market reforms. Seniority pay not included.



**Fig. 7 Social security contributions, expected present value of payments after twenty years of employment**  
 Source: United States Department of Social Security (1983–1999), Ministry of Labor in Latin America and the Caribbean.  
 Note: Includes the cost of seniority pay as well.

**Table 4** Estimates of Long-Run Constant-Output Labor Demand Elasticity

Study	Data	Description	Wage Elasticity
<i>A. Latin America</i>			
Mondino and Montoya (chap. 6 in this volume)	Panel of establishments; manufacturing; 1990–1996; quarterly; Argentina	No capital; instruments for output and wages; from dynamic labor demand	[–.353, –.94]
Saavedra and Torero (chap. 2 in this volume)	Panel of establishments; firms with more than 10 workers; 1986–1996; bimonthly; Peru	No capital; instruments for output; Labor costs in- cludes legislative costs; sta- tic labor demand	–.19
Fajnzylber and Maloney (2000)	Panel of establishments; yearly; various countries Chile (1981–1986): White collar Blue collar Colombia (1990–1991): White collar Blue collar Mexico (1986–1990): White collar Blue collar		–0.214 –0.373 –0.26 –0.489 –0.128 –0.203
Roberts and Skoufias (1997)	Panel of manufacturing data; 1981–1987; Colombia Skilled Unskilled		–0.42 –0.65
Cassoni, Allen, and Labadie (chap. 8 in this volume)	2-digit manufacturing; 1975–1997; Uruguay 1975–1984 1985–1997	No capital; system of equations	–0.69 –0.22
Cárdenas and Bernal (chap. 4 in this volume)	Panel of 92 manufacturing sectors 4 digit CIIU; 1978–1995	No capital; dynamic labor demand	–1.43
<i>B. Rest of the World</i>			
Waud (1968)	2-digit manufacturing; 1954–1964; quarterly; U.S.	Capital	–1.03
De Pelsmacker (1984)	5 auto manufacturing firms; 1976–1982; Belgium	Capital, labor prices, pro- duction workers	–0.44
Field and Grebenstein (1980)	10 2-digit manufacturing industry; 1971; U.S.	Capital and energy prices included	–0.51
Denny, Fuss, and Waverman (1981)	2-digit manufacturing; annual Canada: 1962–1975 U.S.: 1948–1971	Capital and energy prices	–0.46 –0.56
Wylie (1990)	Four 2-digit manufacturing; annual; 1900–1929; U.S.		–0.52

informality, except for the study by Maloney and Nuñez Mendez (chap. 1 in this volume), which follows the ILO convention.

Measured by the extent of compliance with social security regulations in Latin America, noncompliance is substantial. According to IADB (2004), only 42.7 percent of all workers and 60 percent of all wage employees are contributing to such programs (see table 2). Among the countries covered in the individual studies of this volume, compliance as percentage of total employment is the highest in Chile and Uruguay and the lowest in Peru. Compliance tends to be higher among skilled workers, among workers employed in larger firms, and in the manufacturing and high-paying finance and business services sectors. In these latter sectors, the effect of regulations should be easier to detect. Compliance is higher when the burden of regulation is lower.

#### **I.4 The Impact of Labor Market Regulations**

This section summarizes the studies of the impact of labor market regulations that are presented in this volume and places them in the context of the literature on more economically developed countries. We distinguish between policies that alter employment levels (generating static costs) from policies that affect employment flows (generating dynamic transition costs). The essays contained in this book present evidence on both types of policies. We also report findings on the effects of temporary contracts and minimum wages.

##### **I.4.1 A Static Labor Demand-Labor Supply Analysis**

A convenient starting point from which to assess the impact of labor market regulations on employment levels is the standard neoclassical labor demand-labor supply framework. If mandatory legislation increases labor costs, economic theory predicts that a move up the labor demand function produces a fall in employment. The slope of the labor demand schedule provides a good measure of the policy-induced change in employment when governments or trade unions set labor costs administratively. The standard theory is silent about the effects of the regulation on unemployment because it depends on whether the displaced workers drop out of the labor force or attempt to seek new jobs.

Table 4 summarizes estimates of constant-output labor demand elasticities for Latin America. As noted by Hamermesh (chap. 11 in this volume), these estimates are comparable to those estimated for other countries.<sup>14</sup> Al-

14. A more comprehensive measure of the impact of regulations on employment is given by the total elasticity, which includes the possible scale effects of an increase in regulation including the entry and exit of firms due to changes in labor costs. Unfortunately, there is very little empirical evidence in this book regarding the magnitude of the total elasticity, although studies by Hopenhayn and Rogerson (1993) and Nicoletti and Scarpetta (2003) suggest that entry and exit decisions are an important component of the response to regulation.

though labor demand studies abound, we focus on those studies that use disaggregated industry or individual firm data to infer the labor demand parameters, because models fit on such data produces more reliable estimates of underlying production parameters than models fit on data at higher levels of aggregation (Hamermesh 1993). Comparisons across types of workers indicate that labor demand elasticities are larger for blue-collar than for white-collar workers, suggesting a lower impact of regulations on the employment rates of the latter. Estimates of labor demand for Latin America tend to be somewhat lower than those obtained for other countries of the world, especially those estimated for Peru and Mexico. (See the estimates from industrial countries in the lower panel of the table.) Nonetheless, all estimates are between 0 and  $-1.5$ , and most of them cluster between  $-0.2$  and  $-0.6$ , well within the range for worldwide estimates reported by Hamermesh (1993) for output-constant labor demand elasticities.<sup>15</sup> This range of estimates implies that a 10 percent increase in labor costs will result in a sizable decline in employment, between 2 percent and 6 percent.

The preceding analysis assumes that the cost of regulations is entirely paid by employers. However, when the supply of labor is not perfectly elastic, part of the increase in labor costs will be compensated by lower wages, reducing the disemployment effect of the regulations. Alternatively, workers may not perceive the cost of regulation as a tax, because higher contributions pay for improved job benefits, which are valued. In this case, workers will be willing to pay for this benefit, reducing their wage demands. This wage offset would also contribute to lessening the impact of regulations on employment.

How likely is it that the costs of labor market regulations are shifted to workers in Latin America? Before reviewing the existing evidence, it is important to note important features of Latin American labor markets. First, high evasion implies that the relevant labor supply to the formal sector in developing countries is likely to be more elastic than in developed ones. Thus, if workers have access to similar jobs in both the formal and informal sectors, the possibilities of shifting costs to workers are lessened, resulting in a high elasticity of labor supply to formal-sector firms that comply with regulations. Second, as previously noted, in some countries minimum wages are quite high, both absolutely and in relation to the average wage, and this reduces the scope for wage shifts (see figure 2). Moreover, Maloney and Nuñez Mendez (chap. 1 in this volume) show piling up of workers at minimum wage levels, suggesting that compliance with the minimum wage is substantial even in the so-called “informal” sectors so that wage shifting will be attenuated in countries with a binding minimum

15. Hamermesh (1993) reports a range between  $-0.15$  and  $-0.75$  and an average estimate of  $-0.45$ .

wage that also affects the informal sector. Third, although most social security programs in the region are restricted to covered workers, and this tightens the link between contributions and benefits, the dismal financial condition of some social security systems and the high degree of discretion exercised by governments over the determination of benefits weaken this link. In this respect, the recent social security reforms aimed at privatizing pensions should strengthen the relationship between benefits and costs in many countries of the region.

Several empirical studies have attempted to measure the impact of mandatory benefits on employment rates. Gruber (1994) analyzes the effects of insurance for workplace injuries and mandated maternity benefits in the United States and finds that a large share of the cost is shifted to wages, with only minor disemployment effects. In contrast, Kaestner (1996) examines the effect of unemployment insurance contributions on the employment of U.S. youth and finds large disemployment effects and little wage shifting.

For developing countries, there is some evidence on the magnitude of wage shifts predating the studies collected in this volume. MacIsaac and Rama (1997) assess the fungibility of the cost of mandated benefits in Ecuador. In 1994, the year they study, Ecuador had one of the most cumbersome labor legislation regimes in Latin America. Beyond mandated contributions to social security programs, the law also mandated payment of thirteen-, fourteen-, fifteen-, and sixteen-month payments for separation at various times of the same year. MacIsaac and Rama's analysis suggests that while labor market regulations increase labor costs, part of the increase is shifted to workers in the form of lower base wages. Thus, for an average Ecuadorian worker, social security contributions and other mandated benefits amount to a large share of the base wage. However, workers whose employers comply with regulations earn on average only 18 percent more than workers at noncompliant firms. This difference is explained by a 39 percent reduction in the base earnings of workers in compliant firms. Interestingly, these reductions are not uniform across firms; they are smaller in larger firms and essentially zero in the public sector and in unionized firms.

Mondino and Montoya (chap. 6 in this volume) and Edwards and Cox-Edwards (1999) explore this topic for Argentina and Chile, respectively, by comparing wages of workers who have access to social security programs with wages of uncovered workers. In Argentina, Mondino and Montoya (chap. 6 in this volume) find that during the period 1975–1996, wages of noncovered workers were 8 percent higher than the wages of covered workers. Considering that employee-paid payroll contributions average 40 percent of the payroll, the share of contributions paid by workers is around 20 percent of total labor costs. In Chile, Edwards and Cox-Edwards (1999) find evidence of a larger wage shift. In 1994, cash wages for workers cov-

ered by mandatory pension, health, and life insurance were 14 percent lower than wages for noncovered workers. Since, in that year, social security contributions amounted to 20 percent of wages and were nominally paid by workers, their estimates suggest that about 70 percent of the cost of social security contributions were absorbed by workers, while the other 30 percent fell on employers. Gruber (1997) reports evidence of an even larger wage shift in the aftermath of the 1981 pension reform in Chile. The 1981 reform reduced employer-paid labor taxes and increased taxes paid by employees. In addition, the funding of some programs was shifted to general revenue. Using this tax change as a “natural experiment” and data on individual firms’ payments in labor taxes and wages, he seeks to determine whether lower employer-paid labor taxes are associated with higher wages within a firm. His results suggest a full shift of payroll taxes to wages and no effect on employment.<sup>16</sup>

Marrufo (2001) examines the 1997 reform in Mexico, which, as in Chile, transformed the pay-as-you-go pension system into an individual retirement accounts (IRA) system. She finds evidence of substantial employment reallocation between noncovered and covered sectors, suggesting that the labor supply to covered sectors is fairly elastic. However, she also finds evidence of a wage shift in response to a reform that ties benefits to taxes collected. Decomposing the effect of the reforms into the effect of a tax reduction and the effect of tying benefits to contributions, she finds that increasing social security taxes reduces wages by 43 percent of the tax increase, while increasing benefits decreases wages by 57 percent of the value of benefits.

An important factor determining the extent of wage pass-through is whether minimum wages bind. Maloney and Nuñez Mendez (chap. 1 in this volume) document that the minimum wage binds in Colombia. This explains the weak pass-through effects reported by Cárdenas and Bernal (chap. 4 in this volume) for Colombia. At the same time, the minimum wage is less binding, and pass-through effects may be more substantial in Mexico and Chile, and this may explain the Marrufo (2001) and Gruber (1997) results.

All in all, the available evidence suggests that at least part of the cost of

16. Measuring the impact of such an “experiment” is complicated by many factors. (See the discussion in Edwards and Cox-Edwards 2000.) First, although payroll taxes declined, worker contributions increased. If measured wage payments by firms include employee contributions, then a decline in employer-paid taxes will be associated with higher measured wages due to higher employee-paid contributions. Second, measurement error in wages biases his estimates toward finding full shifting, as he reports. The quality of his instruments is questionable, and he is forced to make strong assumptions to circumvent a severe measurement error problem. Third, at a time when social security reform made work benefits more attractive, he estimates that wages were rising. The only way that wages can rise to match the decreased employer taxes in an environment with an improved link between employee contributions and benefits is if labor supply is perfectly inelastic to covered sector firms, which seems implausible.

nonwage benefits is passed on to workers in the form of lower wages, and, therefore, the employment cost of such programs will be lower than what is predicted by the elasticity of the labor demand. Combining wage-shift and labor demand estimates indicates that a 10 percent increase in nonwage labor costs can lead to a decline in employment rates ranging between 0.6 and 4.8 percent, with most of the evidence shaded toward the high end of this spectrum.

Given the significance of these estimates for policy decisions, it is important to estimate them as accurately as possible. In this regard, the room for improvement in the literature is still large. As they stand, they might overestimate or underestimate the true employment impact depending on which of the following two effects dominates. On the one hand, the reported estimates are based on constant-output labor demand elasticities, which do not consider the employment effects of regulations through a negative effect on the scale of production of existing firms and on entry and exit decisions of firms. From this perspective, the reported range of estimates provides a lower bound on the disemployment effects of regulation. Moreover, the estimates of the wage shift in MacIsaac and Rama (1997), Mondino and Montoya (chap. 6 in this volume), and Edwards and Cox-Edwards (1999) only include the cost of social security programs, but do not include the cost of other regulations such as job security or vacation time. Once the cost of these regulations is taken into account, the computed wage shift could be lower than what we report above, and, therefore, the estimated effects of those costs on employment would be larger.

On the other hand, studies comparing wages of covered and noncovered workers performed using a cross-section of workers, such as most of the ones discussed above, may underestimate wage shifts and overestimate employment costs. It is necessary to model selection into covered sectors. This is because unobserved personal characteristics correlated with social security affiliation might explain higher wages in covered sectors.<sup>17</sup> If this correlation is substantial, it will lead to an underestimation of wage differences between covered and uncovered workers, and hence reduce estimates of the fraction of wage costs shifted to workers. This concern highlights the importance of the Marrufo (2001) study because she controls for sectoral self-selection bias and still finds substantial evidence of wage shifting. If her selection adjustments to the Mexican data are typical of what would be found in other Latin American countries, the weight of the evidence in this book and the literature on firm entry in response to incentives suggest that the studies reported in this volume underestimate the disemployment effects of regulation.

17. For instance, if workers covered by social security programs also happen to be more productive, then they will also have higher wages. Yet, higher wages are explained by unobserved productivity and not by social security affiliation.

#### I.4.2 Job Security Provisions Alter Hiring and Firing Decisions

Regulations affecting transition costs are not adequately analyzed within a simple static labor demand–labor supply framework. Dismissal costs and other regulations not only increase labor costs, but also alter firms' firing and hiring decisions. The importance of dismissal costs in Latin America is clearly shown in figure 5. Where nonwage labor costs are low relative to those of OECD countries, dismissal costs tend to be very high. These costs make Latin American labor markets less flexible than OECD markets and likely impair productivity and adaptation to new technology and trade patterns as they do in Europe (see Heckman 2003). It is thus important to assess the impact, if any, that such policies have on the functioning of the labor market.

##### *Theoretical Discussion*

To analyze the full impact of job security provisions requires a more complex framework that encompasses dynamic decisions of firms. Bertola (1990) and Bentolila and Bertola (1990) develop dynamic partial-equilibrium models to assess how a firm's firing and hiring decisions are affected by dismissal costs. In the face of a given shock, the optimal employment policy of a firm involves one of three state-contingent responses: (1) dismissing workers, (2) hiring workers, or (3) doing nothing. Appendix B presents a simple two-period model of labor adjustment that summarizes the main ideas in this literature.

In the face of a negative shock and declining marginal value of labor, a firm might want to dismiss some workers. However, it faces a dismissal cost in most regulatory regimes in LAC. This cost has the effect of discouraging firms from adjusting their labor force, resulting in fewer dismissals than the number of dismissals that would occur in a scenario in the absence of such costs. Conversely, in the face of a positive shock, firms might want to hire additional workers but would take into account that it would be costly for some workers to be fired if future demand declined. This potential cost acts as a hiring cost, effectively reducing the creation of new jobs in a relatively healthy economy. The net result is lower employment rates in expansions, higher employment rates in recessions, and lower turnover rates as firms hire and fire fewer workers than they would in the absence of adjustment costs.

Adjustment costs produce a decline in employment variability associated with firing costs. The implication of these models for average employment is ambiguous. In particular, whether average employment rates increase or decline as a result of firing costs depends on whether over the cycle the decline in hiring rates more than compensates for the reduction in dismissals. Simulations reported in Bertola (1990) and Bentolila and Bertola (1990) suggest that average employment in a given firm is likely to increase when firing costs increase. However, these results are quite sensi-

tive to different assumptions about the persistence of shocks, the elasticity of the labor demand, the magnitude of the discount rate, and the functional form of the production function. Less persistent shocks and lower discount rates produce larger negative effects of job security on employment because both factors reduce hiring relative to firing (Bentolila and Saint-Paul 1994; Bertola, 1992). Furthermore, a higher elasticity of the demand for goods implies a larger negative effect of job security on employment rates. In addition, when investment decisions are also considered, firing costs lower profits and discourage investment, increasing the likelihood that they reduce the demand for labor (Risager and Sorensen 1997).

The Bertola (1990) and Bentolila and Bertola (1990) analyses focus on employment rates in a “representative” firm without considering the impact of firing costs on the extensive margin, that is, on how firing costs affect the creation and destruction of firms. Hopenhayn and Rogerson (1993) develop a general equilibrium model based on the U.S. economy. The partial equilibrium framework of Bertola (1990) is embedded in their model as part of a general equilibrium framework in which jobs and firms are created and destroyed in every period in response to firm-specific shocks. In the context of their model, Hopenhayn and Rogerson (1993) find that increasing firing costs in the United States would lead to an increase in the average employment of existing firms as a consequence of the reduction in firings. However, they also find that such a policy would result in lower firm entry and lower job creation in newly created firms. These final two effects could potentially offset the increase in employment in existing firms, and they would thus reduce overall employment rates.

The recent literature has also emphasized the possible impact of job security regulations on the composition of employment. Kugler (chap. 3 in this volume) proposes a model in which job security regulations provide incentives for high turnover firms to operate in the informal sector. This decision would entail producing at a small, less efficient scale in order to remain inconspicuous to tax and labor authorities. In this framework, high job security costs paid by formal sector firms would likely increase informality rates. Pagés and Montenegro (1999) develop a model in which job security provisions, which depend on tenure, bias employment against young workers in favor of older ones. As severance pay increases with tenure, and tenure tends to increase with age, older workers become more costly to dismiss than younger ones. If wages do not adjust appropriately, negative shocks result in a disproportionate share of layoffs among young workers. Therefore, job security based on tenure results in lower employment rates for the young, relative to older, workers because it reduces hiring and increases layoffs for young workers. This effect has also been found in studies of European employment (Heckman 2003).

Finally, it is important to understand that not all components of dismissal costs may have the same effect on employment and unemployment

rates. Thus, in principle, there is an important conceptual distinction between advance notice and indemnities, which are state contingent and affect the cost of adjustment to different states, and seniority pay provisions, which are paid in all states and do not affect transitions. The latter are more comparable to other nonwage costs such as vacation and other mandatory benefits.

The existing evidence regarding the impact of employment protection is abundant but inconclusive. Table 5 from Addison and Teixeira (2001) summarizes the current literature. While Addison and Grosso (1996), Grubb and Wells (1993), Lazear (1990), Heckman and Pagés (2000), Nickell (1997), and Nicoletti and Scarpetta (2001) find a negative relationship between job security provisions and employment, other studies, such as Addison, Teixeira, and Grosso (2000), (Organization for Economic Cooperation and Development [OECD] 1999), Garibaldi and Mauro (1999), and Freeman (2002) do not find evidence of such a relationship. The evidence on the effects of job security on unemployment is equally ambiguous. Some studies find a positive link between job security and unemployment (Addison and Grosso 1996; Elmeskov, Martin, and Scarpetta 1998; Lazear 1990), while others find no effect (Blanchard 1998; Heckman and Pagés 2000; Nickell 1997). Our own estimates at the end of this chapter give reasons for these mixed findings. All these studies are based on the analysis of aggregates of cross-country time series data with little variation in regulatory policies. The studies presented in this volume surmount some of these difficulties by studying episodes of major labor reform using large micro-data sets. Using disaggregated data for single countries, Mondino and Montoya (chap. 6 in this volume) and Saavedra and Torero (chap. 2 in this volume) find a large negative relationship between employment protection and employment. The studies presented in this volume contribute substantially to a literature that analyzes the consequences of reforms. Recent studies for OECD countries using disaggregated data suggest a negative effect of job security regulations on employment. Autor, Donohue, and Schwab (2003) estimate the effects of recent common law wrongful discharge doctrines adopted by courts across states in the United States that limit employment at will. They find that the wrongful discharge doctrine has a negative impact on employment to population rates in state labor markets. Similarly, Kugler, Jimeno, and Hernanz (2002) find that in Spain a combination of a reduction in payroll taxes and the reduction of dismissal costs increased the employment of workers on permanent contracts. Finally, Acemoglu and Angrist (2001), and the earlier work of Deleire (2000), examine the effects of the Americans with Disabilities Act (ADA), which outlaws discrimination against the disabled in hiring, firing, and pay on the employment rate of workers with disabilities. The Acemoglu and Angrist findings and prior work by Deleire (2000) suggest that the passage of the act reduced employment for disabled workers.

Table 5 Effects of Employment Protection on Employment and Unemployment: Selected Studies

Study	Sample	EP Measure	Outcome Indicator(s)	Other Variables	Methodology	Finding
Lazear (1990)	20 countries; 1956–1984	Severance pay due blue-collar workers with 10 years of service; time-varying measure	Employment population ratio, unemployment rate, average hours worked per week	Quadratic time trend and, in some specifications, controls for population of working age and growth in per capita GDP (interacted with EP measure)	Pooled time-series/cross-section estimates; selective corrections for fixed effects, random effects, and autocorrelation	In favored specifications, EP raises unemployment and reduces employment participation and hours.
Addison, Teixeira, and Grosso (2000)	As above	As above	As above	As above, but uses full Lazear specification	Fixed and random effects, with correction for autocorrelation, plus FGLS estimates	EP is statistically insignificant.
OECD (1993)	OECD 19 countries; 1979–1991	Severance pay and notice periods combined across blue-collar and white-collar workers; moment-in-time indicator	Long-term unemployment	UI benefit duration; ALMP expenditures divided by UI benefit expenditures	Pooled time-series/cross-section estimation	EP has positive effects on jobless duration, especially in southern Europe.
Grubb and Wells (1993)	11 EU countries; 1989	Authors' own indicators of ORDW, RDSM, RFTC, and RTWA	Employment; self-employment; part-time work; temporary work; agency work	None	Simple cross-section regressions	ORDW reduces employment, increases self-employment, and reduces part-time work. RDSM (RFTC) increases (decreases) temporary work. RTWA but not RDSM reduces temporary agency work.

*(continued)*

Table 5 (continued)

Study	Sample	EP Measure	Outcome Indicator(s)	Other Variables	Methodology	Finding
Scarpetta (1996)	17 OECD countries; 1983–1993	OECD strictness ranking for regulation of dismissal averaged over regular and fixed-term contracts (OECD 1994, Table 6.7, panel B, col. 2)	Structural unemployment, plus separate regressions for youth unemployment, long-term unemployment, and nonemployment rates	ALMP calculated as expenditure on active measures per person relative to output per capita; summary index of UI benefits (OECD 1994, chapter 8); union density; union coordination, employer coordination, and their sum; centralization of collective bargaining; tax wedge; proxy for product market competition; real interest rates; output gap	Random effects, feasible generalized least squares (FGLS)	EP raises structural unemployment, with stronger effects for youth and long-term unemployment. EP increases nonemployment rate.
Elmeskov, Martin, and Scarpetta (1998)	19 OECD countries; 1983–1995	OECD (1994, table 6.7, panel B, col. 2) ranking, but modified to take account of changes since late 1980s: two-observation, time-varying indicator	Structural unemployment	ALMP (as above); UI benefits (as above); union density; dummies for the degree of coordination on the employer and union sides; dummies for degree of centralization of collective bargaining; tax wedge; output gap, minimum wage relative to average wage	Random effects, FGLS	EP raises structural unemployment but interaction effects are important. EP not statistically significant in either highly centralized/coordinated or decentralized bargaining regimes.

Nickell (1997)	20 OECD countries; 1983–1988 and 1989– 1994	OECD (1996, table 6.7, panel B, col. 5) ranking; also use of labor standards mea- sure covering in ad- dition to EP working time, minimum wages, and employee representation rights (OECD, 1994, table 4.8, col. 6)	Employment- population ratio for whole working-age population and for prime-age males; Overall labor supply (defined as actual annual hours divided by normal annual hours multiplied by employment- population ratio); Log unemployment rate and component short- and long-term rates	UI benefit replace- ment rate; UI benefit duration in years; union density; union coverage index; sum of indices of union and employer coordi- nation; instrument for ALMP expendi- ture; tax wedge; change in inflation	GLS random effects using two cross sections	EP reduces overall employment rate but not that of prime-age males. EP also reduces overall labor supply. For unemployment, EP effect is negative but statistically insignificant. EP re- duces short-term unemployment and increases long-term unemployment. Coefficient estimate for worker labor standards variable is statistically in- significant in unemployment regres- sion.
Nickell and Layard (1999)	As above	As above	As above, plus mea- sures of labor and total factor produc- tivity growth, 1976– 1992	As above, plus owner-occupat- ion rate as a negative proxy for geographic mobility	As above; OLS for analysis of produc- tivity growth	As above; EP is positive and statisti- cally significant in labor and total factor productivity equations, but effect vanishes with correction for initial productivity gap.

*(continued)*

Table 5 (continued)

Study	Sample	EP Measure	Outcome Indicator(s)	Other Variables	Methodology	Finding
OECD (1999)	19 OECD countries; 1985–1990, 1992–1997	OECD (1999, table 2.5) measures for late 1980s and late 1990s; Single overall indicator and also separate indicators for regular employment, temporary employment and collective dismissal; In some specifications further disaggregations for regular and temporary employment	Log unemployment rate, log employment-population ratio, and changes in unemployment and employment; For unemployment: separate results for prime-age males, prime-age females, youth, and low-skilled; For employment: separate results for prime-age males, prime-age females, youth, share of self-employment, share of temporary employment, and temporary employment share in youth employment	UI benefit replacement rate; UI benefit maximum duration; ALMP expenditures as percentage of GDP; degree of centralization of collective bargaining; degree of coordination of collective bargaining; trade union density; trade union coverage; tax wedge; output gap	Two-period panel estimated by random effects, GLS (changes in levels model estimated by OLS)	Irrespective of the form of the indicator, EP coefficient estimate is statistically insignificant for overall employment. It is positive and statistically significant for prime-age male unemployment (overall indicator only). For all other demographic groups EP is statistically insignificant. Further, changes in EP do not affect changes in unemployment for other than prime-age females, where the effect is negative and statistically significant (strictness of EP with respect to regular employment). For employment, the coefficient estimates for EP are negative but statistically insignificant for overall, prime-age female, youth, and temporary employment. Otherwise they are positive and in the case of self-employment statistically significant (overall EP measure and its regular employment variant). Further, changes in EP have statistically insignificant effects for overall employment and for all demographic groups. For self-employment and the share of temporary employment, some statistically significant negative effects are observed.

Garibaldi and Mauro (1999)	21 OECD countries; 1980–1998	OECD (1994, table 6.5, panel B, col. 5) ranking: Moment- in-time measure	Average growth in total civilian em- ployment	Average change in in- flation; average total taxation as share of GDP; average pay- roll taxes as share of GDP; average UI benefit net replace- ment rate for an un- employed worker (OECD 1994, chap- ter 8); union density; index of the coordi- nation collective bargaining; time dummies	Random effects, GLS; six-year averages of data (1980–1985, 1986–1991, 1992–1997)	There is a strong negative associa- tion between EP measure and em- ployment growth in cross section (for 24 out of 27 cases), but in panel re- gressions the association is less pre- cisely estimated and is statistically significant in one of five specifica- tions only.
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Table 5 (continued)

Study	Sample	EP Measure	Outcome Indicator(s)	Other Variables	Methodology	Finding
Nicoletti and Scarpetta (2001)	20 OECD countries; 1982–1998	Two indicators of the stringency of the regulatory apparatus: the first is EP per se, and is based on the time-varying OECD (1999, table 2.5) measure; the second is a measure of the degree of product model regulation and is both static (based on Nicoletti, Scarpetta, and Boylaud 1999) and time varying (based on the authors' evaluation of regulation and market conditions in seven energy and service industries, 1970–1998)	Nonagricultural employment rate	Public employment rate; tax wedge union density; dummy variables for high and intermediate bargaining based on a summary indicator combining centralization and coordination; UI benefit replacement rate composite measure (OECD 1994, chapter 8); and the output gap	Fixed effects without product market regulation indicator; random effects with static product market regulation indicators and two stage regression approach, the second state involving regression of fixed country effects on the static product market regulation indicator. Also fixed effects panel estimates with time-varying EP and product market indicators	In initial fixed effects specification, EP is associated with a statistically significant reduction in employment. When EP enters in interaction with the coordination of collective bargaining dummies, its effects are negative and statistically significant for both intermediate and high coordination. The same results are obtained for the random effects and second state regressions. In each case, the negative effect on employment is stronger in countries with an intermediate degree of coordination. The effect of the static product market regulation variable is statistically significant and negative. Finally, for the fixed effect panel regressions, EP is negative and statistically significant in the basic specification. In interactive form, however, the negative coefficient estimate for EP is only statistically significant for the intermediate coordination measure. In interaction with the coordination measure, the product market regulation variable is negative throughout, but is statistically significant for low and intermediate coordination.

Di Tella and MacCulloch (1999)	21 OECD countries; 1984–1990	World Competitiveness Report data; indicator of flexibility (see text); Time-varying measure with five data points	Employment-population ratio; participation rate; unemployment rate; long-term unemployment rate; and average hours worked per week. For the first two variables, disaggregations by gender are provided.	UI benefit composite measure (OECD 1984, chapter 8), plus level of GDP. Selective results are also provided for a specification that includes union coverage, a dummy for decentralized collective bargaining, and degree of home ownership.	Random effects, least squares dummy variable (LSDV) with country fixed effects, and time fixed effects, and generalized method of moments (GMM) estimates for each outcome indicator.	Statistically significant positive association between flexibility indicator and overall employment-population ratio across all specifications. By demographic group this effect is much stronger for females than for males. Parallel results are obtained for the participation rate. Some evidence that flexibility increases average hours worked. The association between flexibility and the unemployment rate is negative throughout but not always statistically significant. The results for long-term unemployment are less precisely estimated.
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Table 5  
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Study	Sample	EP Measure	Outcome Indicator(s)	Other Variables	Methodology	Finding
Heckman and Pagés (2000)	41 countries from LAC and OECD; 1980–1997 (max)	Authors' own cardinal measure based on severance pay, notice interval, and compensation for unfair dismissal (see text); Two-period time-varying measure	Employment: total, prime-age male, prime-age female, youth, and self-employment. Unemployment: total, prime-age male, prime-age female, youth, and share unemployed for more than 6 months.	Level of GDP, GDP growth, and two demographic controls, namely, female participation rate and proportion of the population aged 15–24 years	Pooled cross-section/time series, random effects, and fixed effects; results for full sample and separate samples of OECD and Latin-American nations.	EP effect is negative and statistically significant for total employment for each estimating procedure. Similar results obtained for males and youth—but not females—the impact of EP on male employment being half the total employment effect and the youth effect is almost double the average effect. EP effects for females and self-employment vary widely across estimating procedure. The results for unemployment depend on methodology and there is no statistically significant effect of EP on longer-term unemployment. Disaggregation by broad national grouping reveals that employment effects of EP by demographic group are negative and mostly statistically significant. The exception is females in the Latin-American grouping. The effects on EP on unemployment are nearly always positive and stronger for the OECD grouping.

Freeman (2002)	23+ countries; 1970–1990	Fraser Institute index of economic freedom (see text); time-varying measure with 6 data points	Level of log GDP per capita, log employment-population ratio, log GDP per employee; and unemployment rate; also changes in levels for the first three variables	Squared freedom index term (in some specifications); country dummies; time dummies	Cross section and “panel” estimates	Countries with a high degree of economic freedom have higher GDP per capita, high employment-population rates, high GDP per employee, and low unemployment—at least in terms of levels. With the exception of unemployment these results do not survive the inclusion of country fixed effects. Estimating GDP per capita in levels and change form for a sample of less developed countries produces statistically significant positive coefficient estimates for the freedom indicator in cross-section and panel estimates.
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Table 5 (continued)

Study	Sample	EP Measure	Outcome Indicator(s)	Other Variables	Methodology	Finding
Blanchard and Wolfers (2000)	20 OECD countries; 1960–1999; 8 five-year averages of data	Static and time-varying measures; static measure taken from Nickell (1997); time-varying measure taken from Lazear (1990) and updated	National unemployment rates (i.e., non-standardized). Basic argument is that unemployment can be explained by shocks which interact with labor market institutions. Shocks are first modeled as common and unobservable and then as country specific.	Basic specification uses 7 (other) labor market institutions taken from Nickell (1997); alternative specification(s) uses two measures of UI benefits (authors' own calculations) that are deployed in fixed and time-varying form	Nonlinear least squares with time effects are interacted with fixed institutions/time-varying institutions; robustness checks offered; nonlinear least squares with country-specific observable shocks (total factor productivity growth, the real rate of interest, and a labor demand shift measure) that are interacted with all 8 labor market institutions; as before, estimates provided for fixed and time-varying institutions	Shock-EP interaction terms point to amplification of the effects of adverse shocks. Essentially the same is true for the remaining institutional variables with two exceptions. The exceptions are coordination of collective bargaining and active labor market policies, which ameliorate the effects of adverse shocks. In general, much weaker interaction effect and poorer fit when static EP (and UI) measures replaced by their time-varying counterparts.

Source: Addison and Teixeira (2001).

Notes: EP = employment protection; UI = unemployment insurance; ALMP = active labor market policy; ORDW = restrictions on overall employee work; RDSM = restriction on dismissal of regular workers; RFTC = restrictions on fixed-term contracts; RTWA = restrictions on temporary work agencies.

*Empirical Evidence for Latin America and the Caribbean*

The essays assembled in this volume assess the impact of job security regulation on employment and turnover rates in LAC and provide the first systematic evidence of its impact on the labor market. Several studies assess the impact of job security on turnover rates in the labor market. Changes in turnover are measured using changes in the duration of jobs (tenure), the duration of unemployment, and rates of exiting out of employment and unemployment.<sup>18</sup> Higher employment exit rates indicate more layoffs (or more quits), while higher exit rates out of unemployment and into formal jobs indicate higher job creation in the formal sector. Other studies examine the impact of job security on employment rates. The definition of employment used in the empirical studies varies, depending on the country being analyzed. In general, most studies focus on employment in large firms, although some also examine more aggregated measures of employment. In addition, a small group of studies also examine the impact of job security on the composition of employment. See table 6 for an overview of the empirical evidence for LAC presented in this volume.

*Turnover Rates*

As predicted by most theoretical models, the bulk of empirical evidence reported in this volume confirms that less-stringent job security tends to be associated with higher turnover and greater flexibility in the labor market. Kugler (chap. 3 in this volume) analyzes the impact of the 1990 labor market reforms in Colombia. She finds that a reduction in job security costs reduces average tenure and increases employment exit rates.<sup>19</sup> This decline is significantly larger in the formal sector, which is covered by the regulations, than in the uncovered or informal sector. In addition, the increase is greater in large firms than in the small ones. Her results show similar patterns within tradable and nontradable sectors, providing a clear indication that the decline in tenure cannot be attributed to contemporary trade reforms. The increasing use of temporary contracts explains only part of the increase in formal turnover rates because job stability also declined for workers employed at permanent jobs.<sup>20</sup>

Kugler also finds a decline in the average duration of unemployment

18. These studies estimate hazard rates. The hazard rate is defined as the rate at which a given spell of employment or unemployment ends in a given period conditional on having lasted a given period of time in the spell (e.g., one month, one year).

19. In this study tenure is measured by the duration of incomplete employment spells.

20. In her study, Kugler performs two types of analyses. First, she uses a difference-in-differences estimator to analyze whether changes in average duration of employment (unemployment) are significantly different in the formal and informal sectors. Second, she estimates an exponential duration model to control for changes in demographic covariates, pooling data from before and after the reform and using interaction terms to assess the differential impact on the formal and informal sectors.

Table 6 Summary of Existing Evidence on the Impact of Job Security (JS) Costs in Latin America

Study	Country	Data	Results
		<i>A. Studies that Analyze Exit Rates Into and Out of Employment</i>	
Kugler (chap. 3 in this volume)	Colombia	Household data	Decline in JS leads to reduction in employment and unemployment duration; some effect due to deregulation of temporary contracts but not all.
Saavedra and Torero (chap. 2 in this volume)	Peru	Household data	Lower JS leads to lower average tenure; higher decline in formal sector; hazard rates increase just at the end of probation period.
Barros and Corseuil (chap. 5 in this volume)	Brazil	Employment Surveys, administrative data, and household surveys	Hazard rates for short durations declined but hazard rates for longer durations increased after an increase in job security. No effects either on adjustment costs or wage elasticities.
Hopenhayn (chap. 9 in this volume)	Argentina	Household data Rotating Panel	Deregulation of temporary contracts leads to increase in hazard rates; hazard rates for short spells (1–3 months) increase by 40% and for 3–6 months spells by 10%.
		<i>B. Studies that Analyze Average Employment and Unemployment</i>	
Kugler (chap. 3 in this volume)	Colombia	Household data on employment	Decline in JS in 1990 brings a decline in unemployment rates. This is based on computing the net effect of changes in hazard rates, in and out of unemployment, induced by the reduction in JS.
Saavedra and Torero (chap. 2 in this volume)	Peru	Firm and sector level data; 1986–1997	They include a direct measure of JS regulations in labor demand function. They estimate a negative and statistically significant coefficient, which is larger (in absolute value) in the more regulated period.
Mondino and Montoya (chap. 6 in this volume)	Argentina	Panel of manufacturing firms; does not account for firm creation	As Saavedra and Torero (this volume), they include a direct measure of JS in labor demand. They also find a negative effect of JS on LD.

Table 6 (continued)

Study	Country	Data	Results
Barros and Corseuil (chap. 5 in this volume)	Brazil	Monthly establishment-level data; 1985–1998; manufacturing; firms employing 5 or more workers	Two step procedure: First, find parameters for labor demand (LD) function for every month; then see whether those parameters change with labor reforms and other development. They find no effect of JS on LD parameters.
Downes, Mamingi, and Antoine (chap. 10 in this volume)	Barbados Trinidad; Jamaica	Aggregated employment. Annual; covers large firms (> 10 emp)	The effects of JS on employment are statistically insignificant and the signs are positive in some cases.
Pagés and Montenegro (1999)	Chile	Household data on employment; annual; 1960–1998	Not a significant effect of JS on aggregated employment but important effect on its composition.
Marquéz (1998)	Cross-country	Cross-section data for LAC and OECD countries	Rank indicator of JS; not significantly associated with lower employment once GDP per capita is accounted for.
Marquéz (1998)	Cross-country	<i>C. Studies that Analyze the Composition of Employment</i> Cross-section data for LAC and OECD countries	Self-employment rates are positively associated with JS even after accounting for differences in GDP per capita.
Montenegro and Pagés (chap. 7 in this volume)	Chile	Household survey data; 1960–1998	Job security is associated with lower employment rates for young workers, female and unskilled workers, and higher employment for older and skilled workers.

after the reforms. In addition, exit rates out of unemployment increase more for workers who leave unemployment by going into the formal sector than they do for those who exit into informal jobs. As with average tenure, her results show quite similar patterns across sectors and a higher exit rate toward larger firms. Finally, only two-thirds of the increase in the rate of entry into unemployment can be attributed to higher use of temporary contracts. The rest is explained by increased exit rates into permanent jobs in the formal sector.

Saavedra and Torero (chap. 2 in this volume) conduct a similar study, evaluating the impact of the 1991 reform in Peru. Like the reform in Colombia, the 1991 Peruvian reform considerably reduced the cost of dismissing workers. Their analysis shows a consistent decline in average tenure from 1991 onward, suggesting higher exit rates from employment. As in the Kugler study, the decline is significantly more pronounced in the formal sector than it is in the informal sector. In addition, the tenure patterns were quite similar across economic sectors, suggesting that these findings cannot be explained by the trade reforms that took place in the early 1990s.

In contrast to these findings, Barros and Corseuil (chap. 5 in this volume) find little evidence that the substantial 1988 Brazilian Constitutional reform altered employment exit rates. In that year, the cost of dismissing workers was raised, and, therefore, a reduction in exit rates would be expected as a result. (Many other reforms were also put in place as well.) Their results indicate that aggregate employment exit rates decline in the formal sector relative to the informal sector for short employment spells (two years or less), but increase for longer spells. Their measured increase in exit rates for long spells could be driven by the special characteristics of the Brazilian system. In this system, employers contribute 8 percent of a worker's wage to the worker's individual account. In case of involuntary dismissal, the worker can claim the principal, the compounded interest rate, and a penalty paid by the firm, which in the 1988 reform was raised from 10 percent to 40 percent of principal plus interest. In the case of a voluntary quit, the worker receives nothing. This asymmetry in the treatment of termination induces workers to force dismissal or to collude with firms to obtain the funds accumulated in the account. It can be argued that the 1988 reform greatly increased the incentives to force dismissals, particularly for workers with longer tenures. This may explain the increase in exit rates for workers with longer employment spells.

These three studies use the informal sector as a control group unaffected by the reforms. Their credibility hinges on the validity of this assumption. Kugler shows that estimates based on formal-informal sector comparisons are likely to be biased. However, such comparisons are still valid under certain conditions—at least as tests of the null hypothesis of no effect of the

reform.<sup>21</sup> When viewed as a whole, these studies provide evidence that dismissal costs and other employment protection mechanisms reduce worker reallocation in the labor market. Unfortunately, these studies do not identify whether reduced worker reallocation is due to reduced layoffs, lower quits, or a mix of both.

Some studies in this book assess the impact of regulations on the speed of adjustment using the length of the lag (the speed of adjustment) as an alternative measure of the constraints faced by firms. The intuition supporting this is based on the original work of Holt et al. (1960).

Let  $n_t^*$  be the optimal level of employment at date  $t$  determined by some implicit (usually static) theory. Let the cost of being out of equilibrium,  $c_t^0$ , be quadratic in deviations of current employment from optimal employment:

$$(2) \quad c_t^0 = \gamma_0(n_t^* - n_t)^2 \quad \gamma_0 > 0$$

The greater the discrepancy between employment at  $t$  and optimal employment, the greater the cost. There is also a cost of adjustment,  $c_t^a$ , which is also assumed to be quadratic in the adjustment from  $n_{t-1}$  to  $n_t$ :

$$(3) \quad c_t^a = \gamma_a(n_t - n_{t-1})^2$$

Minimizing the sum of these costs produces an optimal labor demand  $n_t$ :

$$n_t = (1 - \lambda)n_t^* + \lambda n_{t-1},$$

where

$$\lambda = \frac{\gamma_a}{\gamma_a + \gamma_0}.$$

The greater the cost of adjustment, the bigger the value of  $\lambda$ . Abraham and Houseman (1993) and many others use this method to assess the effect of different regulatory regimes across countries on adjustment costs, while others interact  $\lambda$  with measures of regulations to assess whether the speed of adjustment increases or declines when the regulatory environment is changed. Cárdenas and Bernal (chap. 4 in this volume), Barros and Corseuil (chap. 5 in this volume) and Saavedra and Torero (chap. 2 in this volume) use this methodology to examine whether the speed of adjustment increased or declined after labor reforms. In the study of Saavedra and Torero, their estimated interaction term suggests that more stringent regu-

21. Kugler shows that lower severance pay may induce high-turnover informal firms to move to the formal sector. Assuming either no overlap in the distribution of turnover between covered and uncovered firms or that entry to the covered sector comes from the high-end—or at least from the end that is higher than the formal sector—this shift results in higher turnover in both the formal *and* the informal sector. Higher turnover in the informal sector biases the difference-in-differences estimator downward. Therefore, a positive estimate still provides substantial evidence of increased turnover in the formal sector.

lations reduce the speed of adjustment, particularly in the prereform period, when regulation was very stringent. In the other two studies, this methodology is unable to identify any changes in adjustment due to reforms. This is particularly relevant in the study of Cárdenas and Bernal on Colombia because other methodologies based on duration data (Kugler, chap. 3 in this volume) show clear effects of regulation on adjustment. Addison and Teixeira (2001) indicate that “none of the implementations of this (adjustment cost) model in core OECD countries were able to detect a discernible impact of job security regulations on the speed of employment adjustment.” In the concluding section of this paper, we discuss why the lag coefficient is not a reliable measure of the regulatory costs, especially when applied to cross-country data.

### *Average Employment*

The available evidence for LAC countries shows a consistent, although not always statistically significant, negative impact of job security provisions on average employment rates. Saavedra and Torero (chap. 2 in this volume) and Mondino and Montoya (chap. 6 in this volume) use firm-level panel data to estimate the impact of job security on employment in Peru and Argentina, respectively. Both studies estimate labor demand equations in which an explicit measure of job security appears on the right-hand side of the equation, and both find evidence that higher job security levels are associated with lower employment rates.<sup>22</sup> In the case of Peru, Saavedra and Torero find that the size of the impact of regulations is correlated with the magnitude of the regulations themselves. Thus, the impact is very high at the beginning of their sample (1987–1990), coinciding with a period of very high dismissal costs (see their table 4). Afterward, and coinciding with a period of deregulation, the magnitude of the estimated coefficient declines after a new increase in dismissal costs, only to increase again from 1995 onward. Their estimates for the long-run elasticities of severance pay are very large (in absolute value). Between 1987 and 1990, a 10 percent increase in dismissal costs is estimated to reduce long-run employment rates by 11 percent, keeping wages constant. In subsequent periods, the size of the effect becomes smaller but is still quite large in magnitude (between 3 and 6 percent). In Argentina, the estimated long-run elasticity of a 10 percent increase in dismissal costs is also between 3 and 6 percent.<sup>23</sup>

22. The data for the Peruvian study covers firms with more than ten employees in all sectors of the economy. The Argentinean study only covers manufacturing firms. Given the nature of these surveys, these studies analyze formal employment rather than employment as a whole. The data used in these two studies does not capture job creation by new firms, because both panels are based on a given balanced panel census of firms, which does not adjust for attrition.

23. The methodology used by these studies might lead to upward biased estimates of the elasticity of employment to job security. Thus, for example, Mondino and Montoya construct explicit measures of job security based on

Kugler (chap. 3 in this volume) computes the net impact of the Colombian 1991 labor reform on unemployment rates. Using unemployment and employment exit rate estimates before and after the reform, she finds that the reforms cause a decline in unemployment between 1.3 and 1.7 percentage points. Thus, as in Mondino and Montoya (chap. 6 in this volume) and Saavedra and Torero (chap. 2 in this volume), Kugler's estimates of the impact of deregulation indicate that the positive impact of reduced labor costs on hiring outweighs the negative impact of reduced severance costs on firing, resulting in a decline in unemployment rates.

Heckman and Pagés's (2000) analysis of cross-section time series aggregates also finds evidence of a negative impact of employment protection on employment. However, the evidence presented at the end of this chapter suggests that their results for Latin America are not robust, although their results for OECD Europe are robust. The fragility of their estimates for Latin America, based on aggregate data, suggests the value of using more disaggregated data in reaching sharp conclusions.

Other studies find negative, but statistically less precisely estimated, effects of job security on average employment rates. Pagés and Montenegro (1999) find that job security has a negative but statistically insignificant effect on overall wage-employment rates in Chile. Similarly, Marquéz (1998), using a cross-section sample of Latin American and OECD countries, finds a negative but insignificant coefficient of job security on aggregate employment rates. Table 6 summarizes the various estimates of job security on employment.

Downes, Mamingi, and Antoine (chap. 10 in this volume) also use aggregate time series data to examine changes in the labor demand associated with changes in the regulatory framework in three Caribbean countries. Their inconclusive results are typical of an entire literature. They use an indicator variable that measures periods with more or less stringent regulations. Their estimates do not capture changes in labor demand before and after the reform. However, as in the case in most of the OECD-based literature, their sample variation in regulations and institutions may be too limited and the level of aggregation too great to capture any effects of regulation on employment.

$$JS_j = \delta_j T_j P_j SP_j,$$

where  $\delta_j$  is the average layoff rate in sector  $j$ ,  $T_j$  is average tenure in sector  $j$  for a time period  $t$ ,  $P_j$  is the share of firms in sector  $j$  for time period  $t$  that are covered by regulations, and  $SP_j$  is the mandatory severance pay in sector  $j$ , given average tenure  $T_j$ . This measure provides variability across sectors and periods, and, therefore, it yields a more precise estimation of the impact of job security than before-after types of comparisons. Yet, such a measure may also be correlated with the error term in a labor demand equation because both layoffs and the tenure structure of a firm might be correlated with its employment level. However, robustness analyses reported in Mondino and Montoya suggest that not considering some of this variability still produces positive and statistically significant estimates for the coefficient of the job security measure.

*The Composition of Employment*

Economists have paid relatively more attention to studying the effects of job security on the level of employment and unemployment than to studying the effects of such policies on the distribution of jobs. However, a few studies shed some light on the impact of job security on the composition of employment in LAC. Marquéz (1998) constructs a ranking of the relative severity of labor market regulations (including workweek, contract, and other regulations besides job security provisions) for LAC and OECD countries and uses it to estimate the effects of job security on the formal and informal distribution of employment. He finds that across countries, more stringent regulations coincide with a larger percentage of self-employed workers. In a study of Chile, Montenegro and Pagés (chap. 7 in this volume) use repeated cross-section microdata spanning forty years of data and substantial variation in labor market policies. They control for year effects that are common across workers, as well as for the differential effects of the business cycle and other labor market policies on each demographic group. They find that more stringent job security measures reduce the employment rates of youth and the unskilled, while increasing the employment rates of older and skilled workers. Their results also suggest that job security regulations increase the self-employment of women and unskilled workers, relative to other demographic groups. This evidence is consistent with evidence in Bertola (2001) and Heckman (2003) that job security provisions protect the relatively privileged workers at the expense of the less advantaged ones. In a review of the recent OECD literature, relying on cross-country time series analysis, Addison and Teixeira (2001) reach similar conclusions, stating that while prime-age male employment rates have not been affected by job security provisions, the employment rates of other groups, most notably younger workers, have been affected.

#### I.4.3 Temporary Contracts

Hopenhayn (chap. 9 in this volume) discusses the impact of temporary contracts on the Argentine labor market. Such contracts were introduced following the Spanish model. He finds that these contracts induce an increase in hiring and a substitution away from long-term employment toward short-term employment. So, in the short run, these contracts remove one barrier from the labor market and make it more fluid. At the same time, they tend to promote turnover. Hopenhayn finds that the average hazard rate for the first three months out of employment increased by 30 percent and for tenure above three months by 10 percent. While temporary contracts promote fluidity, they reduce firm attachment and the incentive of firms to invest in workers. Alonso-Borrego and Aguirregabiria (1999) document that in Spanish labor markets, the effect of temporary contracts is to reduce investment in workers and hence to produce lower quality (less-skilled) workers in the long run.

#### I.4.4 Minimum Wages

Maloney and Nuñez Mendez (chap. 1 in this volume) present novel estimates of the impact of minimum wages on wage distributions and employment. Their evidence demonstrates convincingly that minimum wages are binding in many Latin American countries and have substantial effects on employment and wage distributions. An important finding in their analysis is that both covered and uncovered sectors (“formal” and “informal” sectors) respond in similar fashion to wage minimums. The informal sector does not show the downward wage flexibility that traditional models of labor market dualism predict. Another important finding is that minimum wages percolate much more widely across wage distributions in Latin America than they do in the United States. There are substantial effects of minimum wages on wages far up in the distribution of wages. Their study puts to rest the claim that minimum wages are innocuous, even in countries with large “informal” sectors.

Montenegro and Pagés (chap. 7 in this volume) study the effects of minimum wages on the distribution of employment in Chile. They find that, like job security provisions, minimum wages reduce the employment probabilities of the young and the unskilled, relative to older and more skilled workers. Not surprisingly, as suggested in other studies for developed countries, their results indicate that minimum wages are particularly binding for young unskilled workers. However, their results also indicate an adverse effect of the minimum wage on prime-age unskilled workers. Minimum wages adversely affect disadvantaged workers of all ages.

We next turn to a pooled time series cross-country study of the impact of regulation on employment. The fragility and sensitivity of the estimates for the Latin American region that we find highlight the benefits of the micro-data analysis reported in this volume.

### **I.5 Evidence from a Cross-Section Time Series Sample of LAC and OECD Countries**

In this section, we summarize and expand on some of the main results of our recent work, updating our earlier paper (Heckman and Pagés 2000). We use time series of cross sections of countries, and we exploit the substantial variability in labor laws in Latin America to estimate their effects on employment and unemployment. These studies serve to place the chapters in this volume within the broader context of a literature that almost exclusively focuses on time series of cross-section averages of countries. Unfortunately, few empirical regularities emerge when an honest sensitivity analysis is conducted. Nonetheless, a few robust regularities do appear. Payroll taxes reduce employment and (less robustly) in OECD countries, job security regulation reduces employment.

### I.5.1 The Data

Labor market studies focusing on developing countries are hampered by serious data problems. Thus, labor market variables contained in most cross-country databases suffer from a lack of comparability and reliability. To overcome these problems, we construct a new data set that includes OECD and LAC countries. For OECD countries, we collect employment and unemployment data from the OECD statistics. For the Latin American sample, we directly construct the same indicators out of a large set of Latin American household surveys. See appendix A for a more detailed description of the employment and unemployment variables as well as the countries and years used to obtain the LAC data. Population variables are obtained from the United Nations (UN) population database while GDP measures are from the World Bank development indicators. To characterize labor market regulations, we use the set of measures summarized in table 4, defined for each year and country.

Our joint sample collects more than 400 data points from thirty-eight countries; twenty-three in the OECD and fifteen in the LAC. (Mexico is included in the Latin America sample although it belongs to the OECD.) We analyze country means and do not disaggregate further. The sample is an unbalanced panel covering the period 1983–1999. Table 7 reports summary statistics of our data for both our whole sample and for the sub-regional ones.<sup>24</sup> There are large differences between the OECD and the LAC samples. The GDP per capita measures tend to be substantially lower in the LAC than in the OECD region. Conversely, GDP growth is lower in the latter. Indemnities for dismissal and seniority pay are higher in Latin America than in OECD countries, while advance notice provisions and social security contributions are lower. There are important differences in labor market aggregates as well. On average, employment rates are higher in the LAC region than in OECD countries. The reverse is true for unemployment rates. The LAC region also displays a lower percentage of the working-age population in the twenty-five to fifty-four-year-old and the fifty-five to sixty-five-year-old brackets than OECD countries and a higher share of the population in the fifteen- to twenty-four-year-old age group. By constructing our own data set from individual household-level surveys, we are guaranteed that all of the labor market variables are comparable and reliable. One drawback of our data is that for the LAC sample, we only have a few time series observations per country (usually six or seven), and not necessarily from consecutive years.

Our objective is to relate our measures of regulations to employment

24. Table 7 reports the data used in the baseline specification (see also table 8, column [1]). In the specifications where regulations are entered one to one, the number of observations used is larger because we have more data on some regulations than on others. Restricting the sample size to be equal to the one used in the baseline specification does not alter any of the results.

**Table 7** Summary Statistics of Sample used in Baseline Regression

Variable	Mean	Standard Deviation	Min.	Max.
<i>A. Total Sample (N = 417)</i>				
Employment/Population	54.92	7.16	36.90	76.89
Unemployment rate (N = 416)	7.82	4.33	0.50	23.80
Log GDP per capita PPP adjusted	9.43	0.63	7.35	10.37
GDP growth	2.92	2.77	-8.59	12.82
Share of working age pop. 25-54	0.62	0.03	0.51	0.68
Share of working age pop. 55-64	0.14	0.03	0.06	0.19
Social Security (% wage)	0.27	0.15	0.00	0.71
Advance notice <sup>a</sup>	0.82	0.48	0.00	1.97
Indemnities for dismissal <sup>a</sup>	1.27	1.40	0.00	5.97
Seniority pay <sup>a</sup>	0.65	2.35	0.00	9.82
Social Security <sup>a</sup>	35.65	19.13	0.00	91.53
<i>B. Latin America (N = 88)</i>				
Employment/Population	59.09	5.35	47.10	76.89
Unemployment rate	6.52	3.23	0.63	17.10
Log GDP per capita PPP adjusted	8.49	0.45	7.35	9.44
GDP growth	3.31	3.60	-8.59	12.82
Share of working age pop. 25-54	0.58	0.03	0.51	0.64
Share of working age pop. 55-64	0.09	0.02	0.06	0.16
Social Security (% wage)	0.23	0.08	0.10	0.42
Advance notice <sup>a</sup>	0.65	0.45	0.00	1.77
Indemnities for dismissal <sup>a</sup>	2.82	1.05	0.00	5.97
Seniority pay <sup>a</sup>	3.09	4.33	0.00	9.82
Social Security <sup>a</sup>	30.14	10.17	12.98	53.87
<i>C. Industrial Countries Sample (N = 329)</i>				
Employment/Population	53.81	7.17	36.90	68.60
Unemployment rate (N = 328)	8.17	4.52	0.50	23.80
Log GDP per capita PPP adjusted	9.68	0.38	8.50	10.37
GDP growth	2.81	2.50	-7.00	10.74
Share of working age pop. 25-54	0.62	0.03	0.57	0.68
Share of working age pop. 55-64	0.15	0.02	0.09	0.19
Social Security (% wage)	0.29	0.16	0.00	0.71
Advance notice <sup>a</sup>	0.87	0.48	0.00	1.97
Indemnities for dismissal	0.86	1.17	0.00	3.30
Seniority pay	0.00	0.00	0.00	0.00
Social Security <sup>a</sup>	37.12	20.65	0.00	91.53

<sup>a</sup>Regulatory variables measured in multiples of monthly wages.

and unemployment outcomes. Although we perform multivariate analyses, it is interesting to examine the bivariate relationship between regulations and employment. This is particularly easy for regulations such as job security provisions that, within our sample, change at most once or twice per country. In figures 8 and 9, we graph employment before and after reforms for countries that experienced job security reforms. The graphs for LAC should be interpreted with caution because they have been interpolated from incomplete time series data.

There is little evidence that reforms that reduced job security increased employment rates in Colombia. There is also not much evidence that reforms that increased job security had a deleterious effect on employment in Brazil, Chile, or Nicaragua. However, there is some evidence indicating that reforms that liberalized labor markets in Peru increased employment rates, while reforms that increased labor market rigidities reduced employment. For Germany, our data suggest that employment declined at a slower rate after a reform that increased job security, while in Spain and the United Kingdom the opposite seems to be true after liberalization. These figures suggest that periods of less stringent job security regulations coincide with higher employment rates in some countries, while the reverse is also true in other countries. The data presented in these figures, however, fail to control for contemporaneous changes in economic activity or other factors that could be correlated with employment and labor reforms. In the next section, we perform an empirical analysis in an attempt to control for contemporaneous effects that may be correlated with reforms, employment, and unemployment outcomes.

### 1.5.2 Methodology and Results

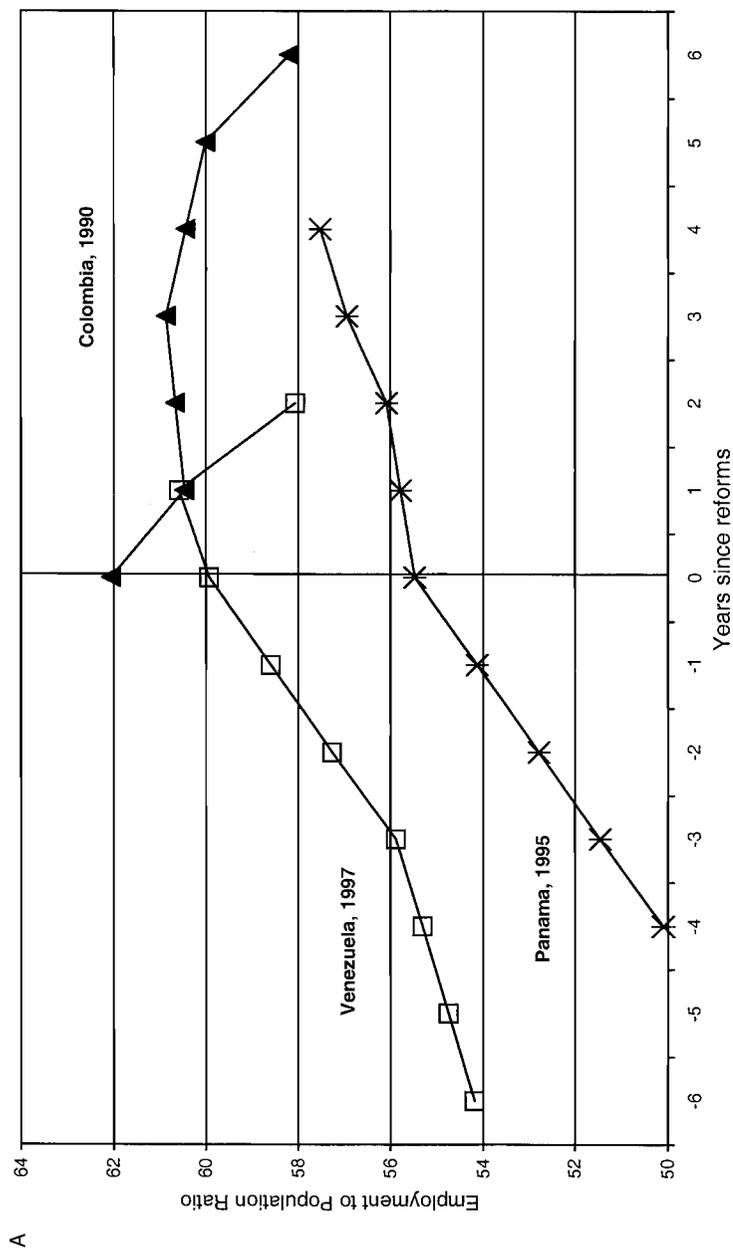
To relate labor market regulations to employment and unemployment outcomes, we estimate the following model:

$$Y_{it} = \alpha_i + \beta_1 \mathbf{X}_{it} + \beta_2 g_{it} + \beta_3 \text{GDPPC}_{it} + \beta_4 \mathbf{Z}_{it} + \varepsilon_{it},$$

where  $Y_{it}$  is a labor market variable (employment or unemployment) of country  $i$  at period  $t$ ,  $\alpha_i$  denotes a country fixed effect,  $\mathbf{X}_{it}$  denotes a vector of employment regulation variables,  $g_{it}$ , and  $\text{GDPPC}_{it}$  denote GDP growth and (log of) GDP per capita, respectively,  $\mathbf{Z}_{it}$  is a vector of demographic controls, and  $\varepsilon_{it}$  is a mean zero error.

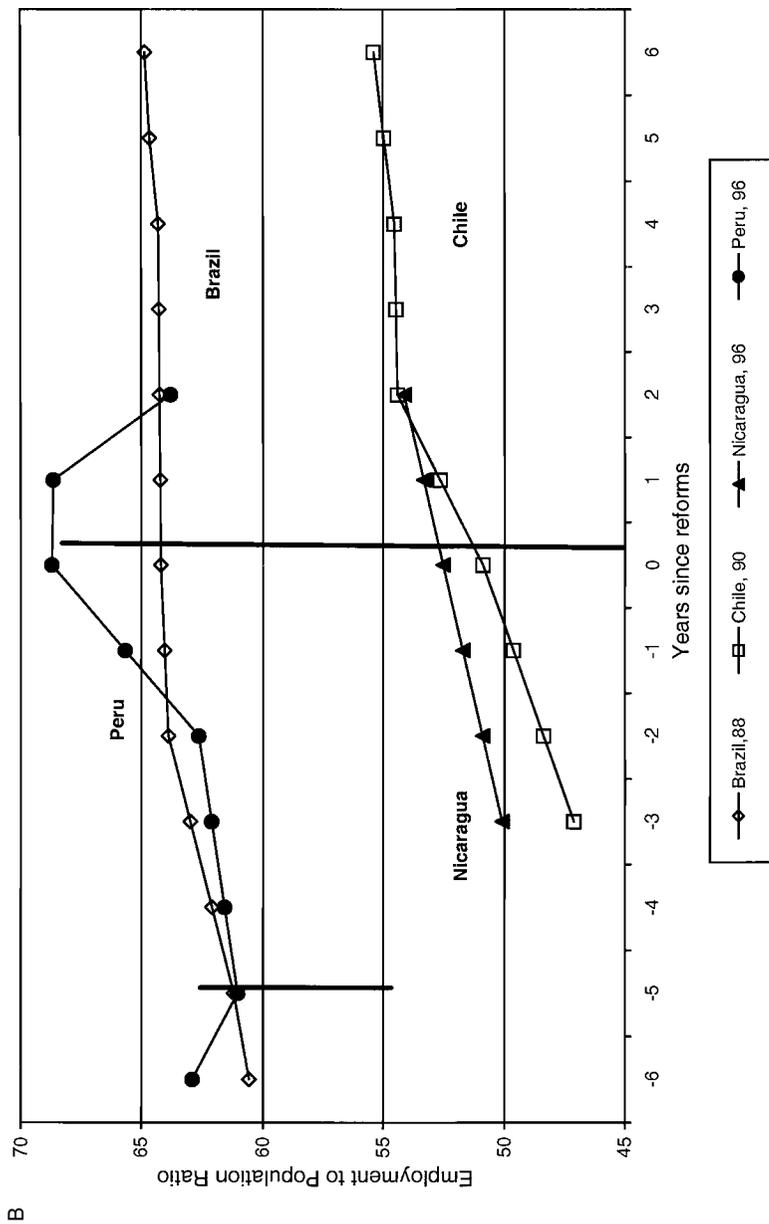
Given the nature of the data with incomplete gaps, we decided not to average observations from a given period to control for business cycle effects, as is often done in OECD studies. Instead, we control for the state of the business cycle in a given year using GDP growth.<sup>25</sup> Although a large part

25. The GDP growth is obtained from the World Bank development indicators. It turns out that deleting or including this variable has no important effect on our empirical conclusions. Deleting or including GDP per capita (PPP adjusted) does not alter our results, either.

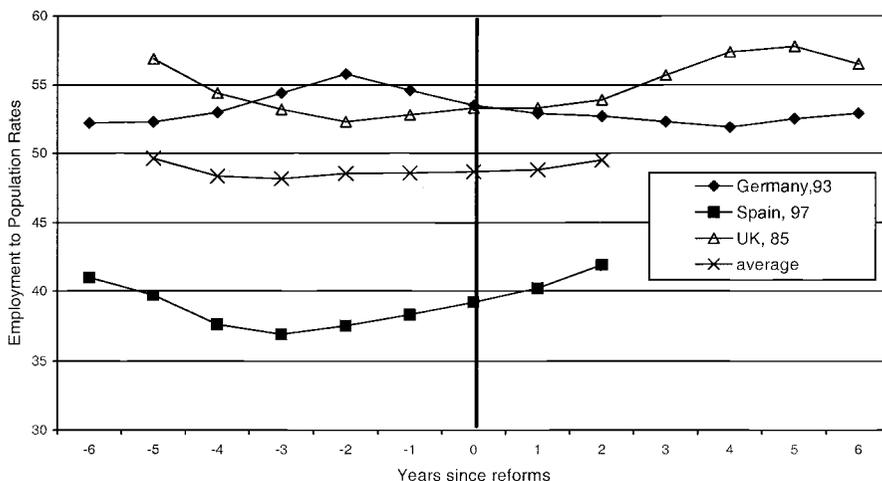


**Fig. 8** *A*, Effect of job security reforms on employment: reforms that reduced job security; *B*, effect of job security reforms on employment: reforms that increased job security

*Sources:* *A*, Series constructed by authors from Household Survey data. See table A.4 for sources in each country; interpolated data.



**Fig. 8 (cont.) 4, Effect of job security reforms on employment: reforms that reduced job security; B, effect of job security reforms on employment: reforms that increased job security**  
*Sources:* A, Series constructed by authors from Household Survey data. See table A.4 for sources in each country; interpolated data.



**Fig. 9 The effect of job security reform on employment: Industrial countries**

*Source:* Labor force statistics, OECD.

of our variation is cross sectional, we use fixed-effects estimates to control for unobserved variables that may be correlated with measures of regulation across countries. In addition, we control for demographic changes that may be correlated with employment and unemployment rates as well as regulatory variables that change over time. Finally, we use GDP per capita (adjusted by PPP) to control for differences in levels of country economic activity across years.<sup>26</sup> We estimate a reduced form model to investigate whether periods of high nonwage labor costs stemming from advance notice, indemnities for dismissal, severance pay, or social security contributions are associated with lower employment or higher unemployment rates. We thus estimate an average net effect of labor laws as they operate through intermediate variables, which we do not include in the regression. We do not estimate a theoretically more appropriate state-contingent labor demand specification because we lack the information on the firm-specific state of the product market confronting individual firms. Therefore, we only attempt to identify the effect of labor laws through their effect on expected (across labor market states) labor cost. This is a severe limitation. However, what we offer is an improvement over the existing literature on cross-country time series that does not quantify labor costs. Appendix B discusses conceptually more appropriate specifications of labor demand functions.

26. We control for GDP growth *and* GDP per capita (PPP adjusted) because we have few data points per country and they are not necessarily contiguous, so we cannot use the simple averaging method employed in OECD studies to control for business-cycle effects.

**Table 8** Results for Employment to Population Rates

	Whole Sample					OECD	Latin American
	(1)	(2)	(3)	(4)	(5)	Sample	Sample
						(6)	(7)
AN	13.938 (15.959)	12.400 (16.841)				13.755 (14.564)	16.637 (15.420)
ID	1.161 (0.897)		-0.469 (0.730)			-2.577 (1.196)**	0.330 (1.637)
SenP	3.292 (1.195)***			1.837 (0.213)***		n.a.	1.887 (2.197)
SSC	-0.230 (0.081)***				-0.191 (0.079)**	-0.301 (0.102)***	-0.187 (0.084)**
GDP growth	0.094 (0.046)**	0.125 (0.050)**	0.123 (0.049)**	0.110 (0.042)***	0.108 (0.046)**	0.034 (0.050)	0.106 (0.072)
Log GDP per capita	2.318 (1.277)	-0.320 (1.044)	-0.451 (1.079)	0.834 (2.253)	3.122 (2.260)	1.828 (1.334)	11.639 (8.152)
Share WAP							
25–54	17.584 (16.750)	29.171 (16.608)	33.259 (18.135)	22.143 (21.704)	16.534 (23.535)	12.112 (19.197)	9.126 (70.273)
55–64	48.456 (35.685)	20.450 (27.018)	27.060 (27.465)	20.614 (26.721)	59.725 (33.501)	50.009 (35.553)	-197.99 (317.709)
Constant	13.588 (17.743)	28.759 (18.736)	37.614 (13.754)***	32.086 (13.318)**	17.013 (13.165)	8.519 (31.305)	-40.525 (55.759)
<i>N</i>	417	476	480	564	484	329	88
<i>R</i> <sup>2</sup>	0.91	0.90	0.89	0.88	0.90	0.93	0.82
<i>P</i> -value <i>F</i> test <sup>a</sup>	0.00					0.04	0.00

*Notes:* Robust standard errors in parentheses. All specification includes country fixed effects. AN = advance notice; ID = indemnities dismissal; SenP = seniority pay; SSC = Social Security contribution; WAP = working age population; *N* = number of observations; n.a. = not applicable.

<sup>a</sup>*P*-value of test that all regulations are jointly equal to zero.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

Table 8 displays our estimates for employment in the overall and regional samples. In these and subsequent results, we compute standard errors that are robust to heteroscedasticity. Throughout this analysis, we extend social security data to yearly frequencies because this information is only available biannually. We do so either by interpolating or by inputting each missing data value with the value from the former year. The results of our empirical analysis are robust across methods. Also, the results do not vary when we consider only the original biennial data. However, in this case, the number of available observations drops substantially.

The coefficients on GDP growth have the expected positive signs and are statistically significant for the overall sample. The coefficients on the demographic variables are positive, suggesting that countries with larger percentages of their working age population above age twenty-five tend to have higher employment rates. However, none of the coefficients on the de-

mographic variables are statistically significant at conventional levels. A higher GDP per capita tends to coincide with higher employment to population rates. However, this estimated effect is not precisely determined.

Our main interest is on measuring the effect of the labor market regulations. We find that once we expand our sample to include a larger number of OECD and LAC countries, the strong negative effect on employment of indemnities for dismissal reported for the pooled sample in Heckman and Pagés (2000) disappears. This is somewhat surprising because not only do we expand the set of countries and periods for which we can construct the measure, but we also revise some of the variables used in our previous analysis to more accurately model the laws. We still estimate a negative, statistically significant coefficient for indemnities in the OECD specification, and this is an important contribution to the European debate on the impact of regulations. This evidence suggests a significant lack of robustness of the estimated effect of regulations that we explore in detail.

With regard to the rest of the regulations, we find a positive, although not statistically significant, coefficient on advance notice cost both in the joint and in the subregional samples. Because seniority pay regulations only exist in Latin America, we cannot identify the impact of these regulations in the OECD sample. However, we find positive coefficients for this variable both in the LAC and in the pooled sample. Moreover, the coefficient in the joint sample is statistically significant at the 5 percent level. The estimated coefficient suggests that an increase in payments equivalent to one month's pay (in expected present value) *increases* employment rates by 1.12 percentage points. One might argue that the strong association between contributions and benefits associated with these types of schemes contributes to an expansion of labor supply increasing overall employment rates. However, the coefficients on advance notice and on indemnities are also positive. In contrast to these results, our estimates suggest a negative effect of social security contributions on employment both in the joint and the subregional samples. (Recall that this is the total contribution of employers and workers.) This effect is statistically significant. According to our estimates, a reduction in the social security contributions from the OECD to the LAC average (see table 4) would increase employment by 3.25 percentage points for the coefficients from the joint sample or by 4.26 percentage points if the OECD coefficient is used (table 8, columns [1] and [6], respectively).

Because there is substantial correlation among our measures of labor market regulation, we also estimate specifications that include these measures one at a time.<sup>27</sup> The number of observations used in each regression

27. The correlation coefficient between advance notice, indemnities for dismissal, and seniority pay is between 0.15 and 0.21 (in absolute value) and statistically significant. Social security contributions are positively and significantly correlated with advance notice, but the correlation with the other measures is close to zero and not statistically significant.

varies because there are countries for which we do not have information for all the regulation measures. The results are unchanged if we restrict all regressions to have the same observations than the ones used in column (1). Adding the regulation measures separately tends to produce smaller coefficients for each of them, suggesting that there are important complementarities that are not captured by the one-at-a-time specifications. We strongly reject the hypothesis that the four measures are not jointly significant (last row, table 8) and therefore include them together in the remaining analysis.

Table 9 presents the estimates for unemployment. As for employment, indemnities for dismissal have a strong positive effect on unemployment in the OECD sample but no effect in the Latin America or the joint sample. The coefficient on advance notice is negative in the overall and OECD samples, but not in the LAC sample. However, the coefficient is not statistically significant in any sample. The coefficient on seniority pay is also

**Table 9** Results for Unemployment

	Whole Sample					OECD	Latin American
	(1)	(2)	(3)	(4)	(5)	Sample	Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
AN	-9.13 (11.08)	-7.29 (11.03)				-9.19 (10.62)	4.06 (9.96)
ID	0.50 (1.00)		-0.01 (0.40)			3.00 (1.01)***	0.43 (1.12)
SenP	0.79 (1.33)			0.21 (0.13)		n.a.	0.84 (1.43)
SSC	0.18 (0.07)**				0.13 (0.05)**	0.22 (0.09)**	0.15 (0.09)
GDP growth	-0.16 (0.04)***	-0.19 (0.05)***	-0.18 (0.04)***	-0.18 (0.05)***	-0.14 (0.04)***	-0.13 (0.05)**	-0.23 (0.09)**
GDP per capita	-2.28 (1.26)	1.78 (1.27)	1.55 (1.05)	1.87 (1.28)	-1.47 (1.30)	-2.70 (1.36)	4.37 (3.13)
Share WAP							
25-54	18.85 (14.26)	-2.72 (16.00)	-5.72 (16.72)	-4.27 (14.98)	17.19 (16.96)	25.20 (16.44)	-66.30 (29.54)**
55-64	-7.35 (28.58)	6.69 (24.90)	2.17 (25.19)	-15.41 (22.29)	-14.69 (25.26)	-7.97 (31.36)	134.98 (214.64)
Constant	23.01 (13.02)	1.13 (12.88)	-3.20 (9.99)	1.05 (7.40)	13.19 (7.63)	28.44 (23.31)	-16.54 (34.32)
<i>N</i>	416	475	479	563	483	328	88
<i>R</i> <sup>2</sup>	0.84	0.79	0.78	0.79	0.84	0.86	0.72
<i>P</i> -value <i>F</i> test	0.02					0.03	0.00

Note: See table 8. All specifications contain country fixed effects.

\**P*-value of test that all regulations are jointly equal to zero.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

positive, suggesting that these schemes increase labor supply. However, the coefficient is not statistically significant. Finally, and consistent with our results on employment, we find that higher social security contributions are associated with higher levels of unemployment in the three samples considered. Our point estimates suggest that reducing social security contributions from the OECD to the LAC average reduces unemployment by 2.54 percentage points if we use the estimate for the joint sample or 3.11 percentage points if we use the OECD one. As with the case of employment, adding the regulatory measures one at a time produces smaller coefficients for each of the measures. As before, we reject the hypothesis that the coefficients of the four variables are jointly equal to zero, and, therefore, we will include them in the rest of the unemployment analysis.

Our results in tables 8 and 9 suggest that not all regulations have the same effect on employment and unemployment rates. Because all regulations are measured in multiples of monthly wages, we can compare the coefficients of the four regulations studied and assess whether they have similar effects. In table 10 we report the results of testing the hypothesis of equality of coefficients. We reject the null hypothesis of identical coefficients for the four measures in the employment, but not in the unemployment, specifications. Interestingly, we are also able to reject the hypothesis that social security payments exert the same effect on employment as seniority pay, despite the fact that both variables imply mandatory contributions defined as a fraction of wages. Perhaps because contributions to finance seniority pay are capitalized in individual accounts, the link between contributions and payments is strengthened, and this reduces or eliminates the “tax” effect. Instead, our results suggest that social security contributions tend to be perceived as taxes on labor and, therefore, reduce the demand of labor above and beyond a possible reduction in the supply of labor. Moreover, we reject the hypothesis that indemnities for dismissal and seniority pay have the same coefficient or that all components of job security (advance notice, indemnities for dismissal, and seniority pay) have the same coefficient. When we impose this (incorrect) constraint on the data, we obtain a positive but not statistically significant coefficient on job security regulations, while the coefficient on social security regulations remains negative and statistically significant.

Finally, although we reject the hypothesis that all four regulations have the same effect on employment, imposing this constraint yields a negative, statistically significant coefficient on employment and a positive, statistically significant coefficient on unemployment. Moreover, the size of the coefficients is very similar to the ones reported in tables 8 and 9 for social security. This is not surprising, because social security regulations constitute the lion’s share of the total cost of regulations.

In summary, our results suggest that not all regulations have the same effect on employment rates. Thus, while social security contributions are

**Table 10** Do all regulations have an equal effect?: Whole Sample

	Employment			Unemployment		
	(1)	(2)	(3)	(4)	(5)	(6)
AN + ID	-0.644 (0.651)			0.121 (0.342)		
SenP + SSC	-0.229 (0.081)**			0.169 (0.066)**		
AN + ID + SenP		0.492 (1.102)			0.226 (0.925)	
SSC		-0.230 (0.078)***			0.169 (0.066)**	
AN + ID + SenP + SSC			-0.231 (0.079)***			0.169 (0.066)**
GDP growth	0.089 (0.045)	0.090 (0.045)**	0.089 (0.045)	-0.157 (0.040)***	-0.157 (0.040)***	-0.157 (0.040)***
Log(GDP) per capita PPP adjusted	2.283 (1.314)	2.222 (1.319)	2.246 (1.324)	-2.276 (1.272)	-2.283 (1.271)	-2.281 (1.269)
% of WAP						
25-54	19.660 (17.441)	20.788 (18.116)	20.662 (18.018)	20.431 (15.120)	20.557 (14.953)	20.548 (14.926)
55-64	56.924 (35.411)	57.644 (36.408)	58.367 (35.863)	-5.119 (29.241)	-5.007 (29.024)	-4.949 (29.031)
Constant	27.194 (13.367)	23.669 (13.226)	25.604 (13.741)	15.621 (10.285)	15.285 (10.434)	15.438 (9.910)
<i>N</i>	417	417	417	416	416	416
<i>R</i> <sup>2</sup>	0.91	0.91	0.91	0.84	0.84	0.84
Test						
AN = ID <sup>a</sup>	0.42			0.39		
SenP = SSC	0.005			0.64		
AN = ID = SenP		0.00			0.49	
ID = SenP	0.00			0.39		
AN = ID = SenP = SSC			0.01			0.63

Notes: See table 8. All specifications contain country fixed effects. PPP = purchasing power parity US\$ adjusted.

<sup>a</sup>*P*-values of the tests in this row and below.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

negatively associated with employment (and positively associated with unemployment), the effect of job security measures on employment is ambiguous. While in the joint and LAC samples, advance notice and indemnities for dismissal have positive, although not statistically significant coefficients, the coefficient on indemnities in the OECD sample is negative and statistically significant at conventional levels. Seniority pay is positively associated with employment, and the coefficients on this variable are statistically significant in most specifications. We also reject the hypothe-

sis that the coefficients on seniority pay and the coefficients on the rest of the components of job security are the same. These differences in results across regions, specifications, and samples, relative to our previous work, suggest a lack of robustness that we further explore. Before turning to a robustness analysis, we first consider the evidence on the shifting of the payroll tax.

### *Wage Shifts*

What is the estimated wage pass-through implied by our coefficients on social security contributions? The social security effect is a robust finding of our aggregate country analysis and so is worth exploring further. Define  $\alpha$  as the elasticity of employment with respect to the cost of labor. Assume that social security taxes are expressed as a percentage of wages. Writing labor demand as a function of wages inclusive of taxes in log linear form, we obtain

$$\ln \text{EMP}(\text{SS}) = \alpha \ln[W(\text{SS})(\text{SS})] + C,$$

where  $\text{SS}$  is the fraction of wages marked up by social security and  $W(\text{SS})$  is the wage which depends on  $\text{SS}$  through equilibrium shifting effects, and  $C$  is a constant standing in for all other factors. Taking derivatives with respect to the  $\text{SS}$  markup, we obtain

$$\frac{\partial \ln \text{EMP}(\text{SS})}{\partial \ln \text{SS}} = \alpha \left( \frac{\partial \ln W(\text{SS})}{\partial \ln (\text{SS})} + 1 \right)$$

Solving for  $\frac{\partial \ln W(\text{SS})}{\partial \ln \text{SS}}$ , we obtain

$$\frac{\partial \ln W(\text{SS})}{\partial \ln \text{SS}} = \frac{1}{\alpha} \left( \frac{\partial \ln \text{EMP}(\text{SS})}{\partial \ln \text{SS}} - \alpha \right).$$

To estimate the wage shift, we estimate  $(\partial \ln \text{EMP}(\text{SS})) / (\partial \ln \text{SS})$  from a specification with the same control variables as the specification reported in table 8, column (1), but where the dependent variable is in logs, advance notice, indemnities for dismissal, and seniority pay are defined in logs, and social security contributions are defined as fractions of gross wages, and we use  $\ln(\text{SS})$  as a regressor. Finally, the elasticity of labor demand to labor costs,  $\alpha$ , is assumed to be within the ranges of estimates reported in table 4 and consistent with the estimates reported in these studies. With all of these elements, we obtain the estimates presented in table 11.<sup>28</sup>

We find that the elasticity of employment with respect to social security contributions is  $-0.7$  for the whole sample, around  $-1$  for the OECD sample and  $-0.447$  for Latin America. This implies that increasing social

28. Hamermesh (1993) reports a range of elasticities between  $-0.15$  and  $-0.7$ . We constrain wage effects of  $\text{SS}$  in table 11 to be nonpositive.

**Table 11** Estimates of Wage Pass-Through for Different Labor Demand Elasticities

	Labor Demand Elasticity	Whole Sample	OECD Sample	Latin American Sample
$\frac{\partial \ln \text{Emp}}{\partial \ln \text{SS}}$		-.702 (0.293)**	-1.048 (0.381)**	-.447 (0.270)
$\frac{\partial \ln W}{\partial \ln \text{SS}}$	-0.15	0	0	0
$\frac{\partial \ln W}{\partial \ln \text{SS}}$	-0.7	0	0	-.36
$\frac{\partial \ln W}{\partial \ln \text{SS}}$	-1.2	-.415	-.12	-.62

*Notes:*  $\partial \ln \text{Emp}/\partial \ln \text{SS}$  is obtained from a regression in which the dependent variable is computed in logarithms and all regulatory variables are also computed in logs. The other control variables used in table 8 are used here. Social security contributions are defined as logarithms of the fraction of the contribution rate, that is we use  $\ln(\text{SS})$ . Standard errors are in parentheses. The other three rows are obtained from the formula in the text, using alternative values of  $\alpha$ , as shown in the first column of the table. When estimated effects on wages are positive, they are constrained to be zero.

\*\*Significant at the 5 percent level.

security contributions by 10 percentage points will lower employment by 7 percent in the overall sample, 10 percent in the OECD and 4.5 percent in Latin America. These are large numbers. They also imply that for a large range of labor demand elasticities, the estimated pass-through is zero, particularly for the OECD sample. Thus, for a labor demand elasticity of  $-0.7$ , the pass-through is zero in OECD and 36 percent in Latin America. Although this larger pass-through in Latin America is at odds with the presumption of a very elastic labor supply to the formal sector, it is consistent with a much higher wage flexibility in Latin America than in industrial countries, due to greater inflation in the region (see IADB 2004). All in all, this evidence suggests that part of the cost of regulations is borne by workers but that social security contributions tend to be perceived as taxes on labor. Increasing social security taxes leads to substantial costs in terms of reductions in employment and increases in unemployment.

### 1.5.3 The Effect of Recent Social Security Reforms

Our negative coefficients on social security contributions suggest that the benefits associated with these contributions are valued at less than 100 percent of their cost. An interesting question is whether the recent wave of pension reforms in Latin America have contributed to strengthen the link between contributions and benefits as well as to increase the size of the wage pass-through. This is especially relevant because most reforms transformed pay-as-you-go systems into full or partial capitalization systems.

**Table 12** The Effect of Pension Reforms on Employment and Unemployment

	Employment			Unemployment		
	Whole Sample (1)	OECD Sample (2)	Latin American Sample (3)	Whole Sample (4)	OECD Sample (5)	Latin American Sample (6)
AN	14.080 (15.629)	13.755 (14.564)	1.184 (14.721)	-9.090 (11.011)	-9.195 (10.617)	17.297 (11.379)
ID	1.286 (0.979)	-2.577 (1.196)**	0.087 (1.702)	0.470 (1.001)	3.005 (1.008)***	0.742 (1.089)
SenP	3.480 (1.305)**	0.000 (0.000)	1.624 (2.299)	0.739 (1.332)	n.a.	1.247 (1.406)
SSC	-0.243 (0.088)***	-0.301 (0.102)**	-0.168 (0.086)	0.173 (0.071)**	0.215 (0.098)**	0.118 (0.087)
SSC · Reform	-0.138 (0.072)	0.000 (0.000)	-0.327 (0.134)**	0.124 (0.044)***	0.000 (0.000)	0.248 (0.109)**
Reform	7.290 (3.174)**	0.000 (0.000)	10.665 (4.765)**	-4.349 (1.926)**	0.000 (0.000)	-7.234 (3.758)
GDP growth	0.096 (0.048)	0.034 (0.050)	0.123 (0.084)	-0.164 (0.041)***	-0.130 (0.053)**	-0.239 (0.086)**
Log GDP per capita	2.348 (1.227)	1.828 (1.334)	10.742 (7.643)	-2.336 (1.236)	-2.700 (1.355)	4.983 (3.292)
% of WAP						
25–54	15.011 (16.884)	12.112 (19.197)	34.692 (69.954)	20.505 (14.199)	25.196 (16.442)	-93.257 (34.205)**
55–64	45.690 (35.828)	50.009 (35.553)	-449.346 (298.027)	-2.593 (28.761)	-7.975 (31.360)	365.975 (223.294)
Constant	15.044 (17.348)	8.519 (31.305)	1.087 (52.262)	20.739 (12.965)	28.443 (23.305)	-49.617 (36.657)
<i>N</i>	417	329	88	416	328	88
<i>R</i> <sup>2</sup>	0.92	0.93	0.84	0.84	0.86	0.76

Notes: See table 8. See table A.1 for a definition of Reform variable.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

To examine this possibility we create a dummy variable, Reform, which, for each country, takes the value of zero in the period prereform and 1 from the period of reform onward (see appendix A for a full description of the periods of reform). We add this variable and an interaction of reform with the cost of social security payments to our baseline specifications (tables 8 and 9 column [1]). Our results suggest contemporaneous positive effects of pension reforms on employment. (See table 12.) However, it is unclear whether this positive effect is associated with the reforms themselves or with other factors. Thus, we find a positive and statistically significant coefficient on the Reform variable, suggesting an increase in employment rates in the postreform period. However, the interaction term with social security re-

form is negative and statistically significant, indicating that social security taxes have larger disemployment effects after the reforms. This higher disincentive could be due to the mixed effects resulting from the transition to the new system. As workers move from the pay-as-you-go to the capitalization system, contributions to social security finance individual accounts and, in many instances, the pensions of those left in the old system. The contribution to fund the old system is likely to be viewed as a pure tax on employment.

#### I.5.4 Robustness

The results reported in this section are based on larger samples and depart substantially from those reported in Heckman and Pagés (2000).<sup>29</sup> Unfortunately, a lack of robustness to changes in specification or sample size is all too common in the cross-section time-series literature that uses aggregate data. Given this potential weakness, we investigate whether our new results are robust to changes in estimation method, measures of regulations, specification and sample size, as well as to the exclusion of outliers.

Given the limited variance of the job security variables, it is interesting to compare our fixed effects coefficients with the results obtained from estimating our main equation using random effects (RE; see table 13). We reject the hypothesis of consistency of the RE estimator for employment in the joint sample at 10 percent. The most substantial difference is the considerably smaller magnitude of the coefficient on indemnities for the OECD sample in the RE model. While in the OECD sample we still find a negative effect of indemnities on employment and a positive effect on unemployment, these effects are no longer statistically significant at conventional levels. The coefficient on advance notice is now positive and statistically significant in the employment regressions and negative and statistically significant in the unemployment regressions. The size and significance of the social security contribution coefficients are robust to the change in method of estimation.

In unreported results available upon request, we also examine whether our results are robust to alternative measurements of the cost of regulations that do not require assumptions about discount or layoff rates. Following Lazear (1990), we measure job security regulations as the mandatory amount (in multiples of monthly wages) that should be paid to a worker who is dismissed after ten years of tenure. A major disadvantage of this measure is that it only reflects job security in one point of the job security tenure schedule. In our samples, both his measure and our measure yield similar results.

29. We are greatly indebted to David Bravo and Sergio Urzua, who made us aware that adding Chile to the original sample used in Heckman and Pagés (2000) substantially changes our earlier conclusions.

**Table 13** Random Effect Estimates

	Employment			Unemployment		
	Total Sample (1)	OECD Sample (2)	LAC Sample (3)	Total Sample (4)	OECD Sample (5)	LAC Sample (6)
AN	4.142 (1.871)**	5.292 (1.986)***	1.417 (4.461)	-2.762 (1.278)**	-3.560 (1.733)**	-0.200 (1.997)
ID	-0.250 (0.347)	-1.010 (0.809)	-0.358 (0.464)	0.027 (0.266)	0.326 (0.706)	-0.048 (0.298)
SenP	0.899 (0.331)***	0.000 (0.000)	0.562 (0.438)	-0.074 (0.225)	0.000 (0.000)	0.009 (0.202)
SSC	-0.221 (0.031)***	-0.259 (0.032)***	-0.164 (0.073)**	0.135 (0.023)***	0.153 (0.029)***	0.090 (0.050)
GDP growth	0.089 (0.046)	0.030 (0.051)	0.123 (0.097)	-0.157 (0.038)***	-0.133 (0.047)***	-0.205 (0.068)***
Log GDP per capita (PPP)	2.292 (0.826)***	1.837 (0.784)**	8.931 (3.251)***	-2.117 (0.668)***	-2.606 (0.705)***	1.607 (1.869)
Share of WAP						
25-54	17.462 (10.657)	8.760 (10.682)	21.529 (37.575)	21.471 (8.598)**	26.494 (9.616)***	-11.405 (22.081)
55-64	48.130 (20.842)**	34.748 (21.002)	-76.504 (75.751)	1.544 (16.411)	2.022 (18.910)	21.309 (40.005)
Constant	18.202 (6.616)***	31.222 (6.896)***	-19.363 (15.833)	12.749 (5.169)**	13.938 (6.160)**	-3.868 (9.823)
<i>N</i>	417	329	88	416	328	88
Hausman Test ( <i>P</i> -value)	0.09	0.03	0.00	0.25	0.01	0.51
<i>R</i> <sup>2</sup>	0.46	0.48	0.004	0.15	0.14	0.26

*Notes:* See table 8 for explanations of abbreviations. Robust standard errors in parentheses. Columns (1) and (4) include a dummy variable that identifies the region, and which takes the value equal to 1 if the country is in Latin America and zero otherwise. PPP = purchasing power parity US\$ adjusted; LAC = Latin American and Caribbean.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

We also assess the sensitivity of our results to the inclusion or exclusion of additional control variables such as year effects, region-specific year effects, time trends, and region-specific time trends. The results on the effect of social security contributions on employment and unemployment are very robust to changes in specification. Other results are less robust. For instance, in a specification with region-specific year-fixed effects, the coefficient on seniority pay is still positive, but it is no longer statistically significant at conventional levels. Adding or deleting either growth rates or GDP levels does not change our conclusions.

Important differences also arise when we assess the sensitivity of our baseline results to changes in sample size. In particular, we find that both

the coefficients on advance notice provisions and indemnities for dismissal are sensitive to the inclusion/exclusion of some countries in the sample, while the coefficients on social security payments and seniority pay do not change. For instance, excluding Germany from the sample greatly increases the coefficient on advance notice in the baseline employment specification. Similarly, excluding Brazil or Peru changes the coefficient on indemnities for dismissal in the employment regressions.

Finally, we check whether our results are robust to the exclusion of outliers, which are defined as those observations for which the difference in the regression coefficient when the  $i$ th observation is included and when it is not, scaling the difference by the estimated standard error of the coefficient, is larger than  $2/\sqrt{n}$  (Belsley, Kuh, and Welsch 1980). Our results confirm that there are no outliers that alter the coefficients for social security contributions. There are a few outliers that modify the coefficients on job security provisions (advance notice, indemnities, and seniority pay). However, they do not qualitatively alter our baseline results.

Taken as a whole, our results suggest that the negative (and statistically significant) association between social security contributions and employment, as well as a positive association between social security contributions and unemployment, is very robust to changes in estimation method, specification, regional sample, sample size, and outliers. The coefficients on our job security measures are much less robust. Thus, while the fixed effect (FE) estimates provide some evidence that in some OECD countries reducing indemnities results in higher employment rates, the evidence across countries provided by our RE estimates is less conclusive. One component of job security, seniority pay, is positively correlated with employment.

### 1.5.5 Endogeneity

It is often argued that labor reforms are put in place when labor market performance is poor. As demonstrated in the figure 3 plots, this is sometimes true for reforms in the LAC region. If a decline in employment rates (and an increase in unemployment rates) prompts a reduction in labor market regulations, then least squares estimates will be upward biased, potentially underestimating a negative relationship between job security or social security taxes and employment. Our baseline specification partly controls for the possibility of such reverse causality because the propensity for reform is partly captured by changes in the GDP or demographic conditions. Another source of concern is the timing of reforms. If labor reforms that liberalize the labor market are undertaken at particularly bad times, an estimated negative relationship between employment and regulations could just be the consequence of mean reversion.

In the results available on request, we address these issues in various ways. First, we attempt to control for differences in the propensity to reform at different points in time by including current and past GDP rates up

**Table 14** Correlation between Dependency Ratio and Social Security Contributions

	Social Security Payments (EPV)		
	Total	OECD	Latin America
Dependency ratio	112.10 (14.65)***	102.38 (14.97)***	283.6 (133.30)***
Country fixed effects?	Yes	Yes	Yes
<i>N</i>	514	411	86
<i>R</i> <sup>2</sup>	0.09	0.09	0.46

*Notes:* Dependency ratio computed as the ratio of the population 65 and older to the working age population (15–64). Robust standard errors in parentheses.

\*\*\*Significant at the 1 percent level.

to five lags. Because, presumably, bad employment outcomes are strongly associated with poor GDP outcomes, the inclusion of this set of variables will control for the propensity to reform. Second, we control for the timing of reforms by interacting changes in regulatory variables with a variable that measures the distance (in years) between the current year and the last business-cycle trough. Finally, we directly address the problem of reverse causality by using the dependency ratio, defined as the ratio of the population aged sixty-five and older to the population in the working age (fifteen to sixty-four), as an instrument for social security contributions.<sup>30</sup> Our results suggest that controlling for either the propensity or the timing of reforms does not alter the conclusions of our analysis.<sup>31</sup>

Regarding our instrumental variable estimates, table 14 indicates that in the three samples considered, social security contributions increase with the dependency ratio. The average dependency ratio in our sample is 0.17, while OECD and LAC are 0.19 and 0.08, respectively. The coefficients in table 14 suggest that if the dependency ratio increases in 1 percentage point, expected discounted social security contributions increase in 1.12 months for the total sample, 1.02 for the OECD, and 2.83 for Latin America. Moreover, our instrumental variable estimates (table 15) suggest that there is a causal relation between changes in social security contributions and changes in employment and unemployment rates, at least in the overall and OECD sample. In these two samples, IV estimates produce larger coefficients than the FE regressions. Instead, the Latin America IV esti-

30. The source of this data is the United Nations Population Statistics (United Nations Population Fund 1988).

31. Another way to control for endogeneity is to use the information in the figure 3 sequence to break out episodes of reform that were not preceded by major downturns (or upturns) of the economy from other episodes and analyze the latter. The problem with this approach in our sample is that it uses up too many scarce degrees of freedom.

**Table 15** Instrumental Variable Estimates

	Employment			Unemployment		
	Total	OECD	Latin America	Total	OECD	Latin America
AN	26.66 (16.26)	23.77 (13.51)	30.77 (24.61)	-15.72 (11.29)	-15.10 (10.01)	-12.73 (19.86)
ID	-1.08 (2.31)	-7.15 (2.38)***	2.33 (3.71)	1.73 (1.68)	5.80 (1.94)***	-1.64 (2.29)
SenP	-0.41 (3.56)	0.00 (0.00)	5.10 (5.42)	2.81 (2.50)	0.00 (0.00)	-2.55 (3.22)
SSC	-1.37 (0.78)*	-1.28 (0.66)*	0.36 (0.58)	0.77 (0.48)	0.80 (0.45)*	-0.47 (0.38)
<i>N</i>	404	321	83	404	321	83
<i>R</i> <sup>2</sup>	0.70	0.79	0.70	0.67	0.74	0.33

*Notes:* All regressions include country fixed effects as well as GDP per capita (PPP adjusted), GDP growth, and the share of workers in working age population between twenty-five and fifty-four and fifty-five and sixty-four. We instrument Social Security contributions (measures in EPV) with the dependency ratio, computed as the ratio of the population sixty-five and older to the working age population (fifteen–sixty-four). Robust standard errors in parentheses. See table 8 for explanations of abbreviations.

\*\*\*Significant at the 1 percent level.

\*Significant at the 10 percent level.

mates yield coefficients with opposite signs to the ones obtained with the FE regressions. However, such coefficients are not statistically significant. The small number of observations available for Latin America is not sufficient to obtain precise IV estimates in this region.

### 1.5.6 Summary

Our analysis of pooled time series cross sections of countries underscores why the studies examining the impact of regulations in OECD countries based on such data have produced such ambiguous results. Lack of variation in the relevant policy measures and poor measures of regulation have hampered empirical analyses of the effect of regulations on labor market outcomes. To surmount these problems, we have expanded the number of countries comprising the LAC region, included more within-country variation, and improved the measures of regulation. Contrary to previously reported estimates, we have found little evidence of a systematic relationship between advance notice and indemnities for dismissal on employment or unemployment in our improved and expanded sample for Latin America. Estimates vary across countries, with some countries showing gains in employment after reducing job security and others showing little benefit to the employment rate or even employment reductions after such reforms, but no clear pattern emerges from the aggregates.

However, we find robust evidence that social security contributions are not fully shifted to workers. Payroll taxation tends to reduce employment and increase unemployment rates across samples and specifications. At the aggregate level, our analyses of reforms intended to increase the link between contributions and payments show mixed results.

## **1.6 Conclusions and Directions for Future Research**

Summarizing an entire school of thought, Freeman (2000, 3) writes that “the institutional organization of the labor market has identifiable large effects on distribution, but modest hard-to-uncover effects on efficiency.” This view is shared by many economists. However, the microevidence summarized in this volume suggests that mandated benefits and job security regulations have a substantial allocative impact both in Latin America and in OECD countries.

What policy lessons can be drawn from the essays in this volume? The evidence assembled in this volume suggests that labor market regulations are an inequality-increasing mechanism, because some workers benefit while many others are hurt. The benefits of programs funded with mandatory payroll contributions should be weighed against their costs in terms of employment. Funding such programs with general revenues does not necessarily reduce employment costs (see Nickell 1997), but strengthening the link between payments and benefits contributes to shifting the cost of such programs to workers, at least in the long run. Regulation acts unevenly across different groups in society. Young, uneducated, and rural workers are much less likely to enjoy coverage than older, skilled, and urban workers.

While the aggregate evidence on the effects of job security on the level of employment is inconclusive, the microstudies assembled here find a large and negative effect of job security on employment. Individual country studies based on microdata reduce the fragility and lack of robustness problems that pervade the cross section of countries’ time series literature.

### **1.6.1 Lessons For Future Research**

While these essays demonstrate that firms and workers respond to incentives in predictable ways and that regulation reduces employment and labor market turnover, more precise quantitative estimates would be desirable. We conclude with a discussion of the main areas in which future research could improve upon the current estimates.

#### *Incidence of Payroll Taxes and General Equilibrium*

Several essays in this volume take significant steps toward addressing whether workers accept lower wages if they receive mandated benefits. These estimates of incidence can be improved. Comparing the wages of covered and uncovered sectors to see if covered workers get lower wages, as

in Cárdenas and Bernal (chap. 4 in this volume) and several other essays in this volume, fails to control for self-selection into these sectors, which several studies in this volume have documented to be important. The method fails to adjust for general equilibrium effects arising from induced entry and exit and the willingness of workers to purchase benefits by accepting reduced wages.

The most comprehensive approach to the incidence question is the analysis of Marrufo (2001), which finds that controlling for self-selection and accounting for general equilibrium effects substantially affects estimates of tax incidence, and difference-in-differences estimates understate the true extent of wage adjustment. As argued by Kugler, the simple difference-in-differences method is downward biased so that the estimates reported in this volume are conservative.

#### *Dynamic Labor Demand*

The empirical models of labor demand estimated by the authors in this volume are traditional static models and dynamic labor demand models based on the assumption of symmetric adjustment costs. They abstract from the asymmetries in labor demand that are produced by severance and indemnity systems. Appendix B sketches out the main ideas in the asymmetric demand literature using a two-period model. Alonso-Borrego and Aguirregabiria (1999) develop the econometrics needed to estimate such models, but the methods remain to be implemented on LAC data. Given that all of the labor demand models estimated in this book assume symmetric adjustment costs, it would be productive to rework these studies using more advanced methods. As previously noted, the inconclusive evidence on the effect of job security on firm adjustment dynamics may be an artifact of the symmetry assumption.

In this class of models, it would also be useful to account for general equilibrium effects of entry and exit of firms. Hopenhayn and Rogerson (1993) demonstrate that, in principle, accounting for general equilibrium effects can reverse the predictions of partial equilibrium models.

#### *Accounting for Nonstationarity*

All of the duration models used to determine the impacts of regulation on labor market turnover assume stationary environments. Any student of Latin America knows how poor that assumption is. The high volatility of economic outcomes in Latin America suggests that this assumption does not adequately characterize the region. Accounting for nonstationarity more systematically would improve econometric estimates of behavioral parameters for the region.

#### *Accounting for the Effects of Regulation on Output*

All of the labor demand studies estimate output-constant wage elasticities. Abstracting from the potentially important econometric problem of

endogeneity of output, output-constant demand functions are more robust because they allow the analyst to abstract from product market adjustments to relative price changes. At the firm level, the output-constant effects of regulation understate the total effect of regulation if regulation raises the marginal cost of labor to the firm and costs cannot be shifted onto wages or other factor costs. The estimates reported here underestimate the full disemployment effects of deregulation in sectors adversely impacted. At the level of the national economy, the effects are more ambiguous because the burden of regulation may impact industries differently although it will still have efficiency losses by distorting sectoral allocations. In a closed economy, relative output prices adjust and will lead to an expansion of output in those sectors least impacted. So in those sectors, greater regulation may lead to greater employment. In an open economy facing world prices, when regulations are not accommodated by a downward adjustment of factor prices, regulation reduces output and accentuates reductions in employment.

A complete analysis of the impact of regulation would require accounting for both product market and factor market adjustments. The presumption is that a full account would produce disemployment effect of regulation on the overall economy, but not necessarily in each sector.

Notice, however, that even if wages adjust fully and there are no adverse effects of regulation on labor demand, regulation may still have substantial effects on the welfare of workers. If a job security mandate is offset by lower wages, worker welfare is not necessarily improved, at least not for all workers. It may be higher or lower depending on how much the mandate differs from what workers and firms would mutually agree upon in an unregulated environment.

#### *Accounting for Serial Correlation*

While most of the studies summarized in this volume measure the cost of regulations by elaborating direct monetary measures of their cost to employers, several authors use the length of the lag (the speed of adjustment) as an alternative measure of the cost of regulation facing the firm. The intuition supporting this is based on the original work of Holt et al. (1960), as previously described in section I.4.2.

In the simple model of equations (2) and (3), if we introduce an error term and an implicit theory of optimal employment as a function of the real wage,  $W_t$ , we obtain

$$(4) \quad n_t^* = a + bW_t + \varepsilon_t, \quad b \leq 0.$$

If  $\varepsilon_t$  is serially correlated, we obtain

$$(5) \quad \varepsilon_t = \rho\varepsilon_{t-1} + u_t,$$

where  $u_t$  has zero mean and is independently and identically distributed, and  $\rho$  is the first-order serial correlation. Analysts obtain a high estimated

value of  $\lambda$  (the coefficient on lagged labor) from a least squares estimation that does not correct for serial correlation because

$$(6) \quad n_t = (1 - \lambda)(a + bW_t) + \lambda n_{t-1} + (1 - \lambda)\varepsilon_t.$$

If  $1 < \lambda < 1$  and  $\rho > 0$ , ordinary least squares (OLS) estimates of  $\lambda$  are upward biased. An asymptotically unbiased estimator that accounts for this serial correlation is based on

$$(7) \quad n_t = (1 - \lambda)(1 - \rho)a + (1 - \lambda)b(W_t - \rho W_{t-1}) + (\lambda + \rho)n_{t-1} - \lambda \rho n_{t-2} \\ + (1 - \lambda)u_t,$$

which is derived from equation (6) by lagging it one period, solving for  $(1 - \lambda)\varepsilon_{t-1}$ , writing  $\varepsilon_t = \rho\varepsilon_{t-1} + u_t$  in equation (6) and substituting for  $\varepsilon_{t-1}$ . This bias is especially important in making cross-country comparisons where serial correlation coefficients may differ greatly across economies. For studies of regulations in a single country, this bias will not affect estimates of the relative cost of different reforms if the serial correlation pattern is invariant across reforms. However, no meaning can be attached to the absolute value of the lag coefficient.

This conventional model assumes symmetric hiring and firing costs. Yet even in the original Holt et al. (1960) study, this assumption was only introduced as a mathematically simplifying one that was contrary to their evidence. A more accurate description of the data from Latin America and other regions is that there are substantial asymmetric adjustment costs.

A measurement model accounting for asymmetric adjustment costs requires a new econometric approach. In work available on request, we consider a model of asymmetric hiring and firing costs based on Hopenhayn and Rogerson (1993). The coefficient on lagged labor is not necessarily monotonic in the cost of labor regulations. This may account for the ambiguous evidence on the impact of regulation on the cost of adjustment obtained from the conventional estimates.<sup>32</sup>

## 1.6.2 Taking Stock

Although there is clearly room for improvement, the body of evidence summarized in this chapter and reported in this book demonstrates that regulation matters, that the choice of labor market institutions matters, and that further labor reforms offer the promise of promoting both efficiency and equity across demographic groups in Latin America. They demonstrate the power of microdata to answer important questions when the evidence from cross-country macro time series is ambiguous.

32. The intuition behind this result is simple. Different serial correlation-fixed cost pairs produce the same lagged employment coefficient. This is also possible in the simple model (6). So it is possible that a regime with higher labor transition costs is also one with lower serial correlation in shocks and so would display a lower estimated lag and a faster adjustment rate. See Barbarino and Heckman (2003).

## Appendix A

### *Definitions and Sources of Variables Used in Section I.5*

For the empirical analysis described in section I.5, we build an unbalanced panel data covering the period 1983–1999. Table A.3 describes the variables and their sources. Table A.4 describes the countries and the years covered in our sample.

#### **Computation of Labor Market Regulation Measures**

##### Advance Notice and Indemnities for Dismissal

###### *OECD Countries*

We gather information on advance notice and indemnities for dismissal for OECD countries from the OECD *Employment Outlook* table 2.A.2, “Required Notice and Severance Pay for Individual Dismissal” (1999, 94–96), which summarizes the “case of a regular employee with tenure beyond any trial period, dismissed on personal grounds or economic redundancy but without fault.” For countries in which it is likely for individual dismissals to be considered “unjust” (measured as those countries to which the OECD gives a score of 2 or more in a 1–3 scale in table 2.A.4, 100)—that is, countries where a “transfer and or retraining to adapt to different work must be attempted prior to dismissal” and where “worker capability cannot be ground for dismissal”—we consider the information summarized in the table entitled “Compensation and Related Remedies Following Unjustified Dismissal.” From this table we see that, for this subset of countries, in at least one country unjust dismissals carry a much higher penalty. This is the case of Spain. We make this contingency explicit by computing the expected severance pay by assigning a 1/2 probability that a dismissal will be considered unfair and will carry the higher severance pay that the law mandates in this event. We obtain information on labor reforms from table 2.1 (OECD 1999, 53), which describes the main changes in legislation since the mid-1980s. We also compare the information described in OECD (1999) with that presented in Grubb and Wells (1993). If they diverge, we take the information in the latter to be valid up to 1993, while we take the information presented in OECD (1999) to be valid from 1997 onward. For the years in between, the index has a missing value. There are only four countries where there are some divergences between the former and the latter source. This is the case of Denmark, Greece, Netherlands, and Sweden. Finally, in countries where the law prescribes different severance pay and advance notice for blue- and white-collar workers, we compute the cost of dismissal as the unweighted average for the two groups. For Hungary, Ko-

rea, New Zealand, and Turkey, the job security measures only take non-missing values from 1990 onward because we could not find legal information for former years. To construct our index, we do not consider upper monetary limits. In addition, we do not consider benefits that firms pay or unions can obtain for their workers that exceed the legal mandatory. Finally, we do not consider what workers can get in courts if they sue their employers.

The following are individual country notes. In Australia, we consider the severance pay awarded to workers dismissed for redundancy. For Canada, we take the maximum of the severance pay and advance notice mandated by the federal and the local jurisdiction. In Greece, for white-collar workers, advance notice can be waived if full severance pay is given. We thereby assume that firms pay in full to avoid paying additional advance notice. In Ireland, the awarded severance pay depends on the age of the worker. We assume that workers receive 0.18 monthly wages per year worked, which corresponds to the (unweighted) average of half of one week per year worked (workers under the age of forty-one) and one week per year worked (workers over the age of forty-one). In Norway, after ten years of tenure, notice period increases with age. To capture this effect, we have increased notice period from three months to four and five in the case of individuals of more than fifteen years of tenure. For Spain, we adjust the severance pay obtained in case of just dismissal by the fact that many dismissals are considered unjust. We therefore weigh mandatory dismissals in case of just and unjust causes by a probability of 1/2 for each event.

### *Latin America*

We consider the legal information, summarized in tables A.1 and A.2, obtained from the Ministries of Labor of individual countries.

In Brazil, employers are required to deposit 8 percent of a workers' wage in individual workers' accounts, which accrue interest rates. In case of a firm initiated dismissal, firms are required to pay a worker severance pay that is a given fraction,  $\varphi$ , of what a worker owns in his individual account. The 1988 constitutional reform increased this share from 0.1 to 0.4 of the total amount in the fund. To compute the fraction of what is accrued in the individual fund, we assume that the interest rate equals the discount rate. Therefore, the indemnity is computed as

$$\text{Indemnities} = \sum_{i=1}^T \delta^{i-1} (1 - \delta)(i) \cdot \varphi,$$

where  $i$  denotes tenure at the firm,  $\delta$  is the per period probability of survival (equal to 0.88), and  $T$  denotes the maximum tenure of a worker in a firm, which is assumed to be equal to twenty. In Honduras, Jamaica, Nicaragua, and Dominican Republic, a constant advance notice equal to one month is assumed. In Peru, there were reforms in job security in 1991, 1995, and

Table A.1 Legislation Concerning Termination of Indefinite Contracts in 1987 and 1999

Country	Date of Reform	Advance Notice		Seniority Premium		Compensation if worker quits?	
		1987	1999	1987	1999	1987	1999
Argentina	None	1-2 months	No changes	0	0	0	0
Bahamas	None	1/2-1 month	No changes	0	0	0	0
Barbados	None	Negotiable, in practice 1 month	No changes	0	0	0	0
Belize	None	1/2-1 month	No changes	0	0	$1/6x \cdot N$ if $N > 10$	No changes
Bolivia	None	3 months	No changes	0	0	$1x \cdot N$ if $N \geq 5$	No changes
Brazil	1988	1 month	No changes	FUND (8% wage goes to FUND, plus interest rate)	No changes	0	0
Chile	1991	1 month	No changes	0	0	No	$1/2x \cdot N^3$ if $N \geq 7$
Colombia	1990	15 days	No changes	$x \cdot N$	FUND (8% wage + $r$ )	$x \cdot N$	FUND (8% wage + $r$ )
Costa Rica	None	1 month	No changes	0	0	0	0
Dominican Republic	1992	1/4-1 month	No changes	0	0	0	0
Ecuador	1991	1 month	No changes	FUND (8% wage + $r$ )	No changes	FUND (8% wage + $r$ )	No changes
El Salvador	1994	0-7 days	No changes	0	0	0	0
Guatemala	None	0	No changes	0	0	0	0
Guyana	1997	1/2 month	1 month if $N \geq 1$	0	0	0	0

(continued)

Table A.1 (continued)

Country	Date of Reform	Advance Notice		Seniority Premium		Compensation if worker quits?	
		1987	1999	1987	1999	1987	1999
Honduras	None	1 day–2 months	No changes	0	0	0	0
Jamaica	None	2–12 weeks	No changes	0	0	0	0
Mexico	None	0–1 month	No changes	0	0	0	0
Nicaragua	1996	1–2 months	0	0	0	0	$x \cdot N$ if $N = 1-3$ $3x \cdot N + 2/3x \cdot N$ if $N > 3$
Panama	1995	1 month	No changes	$1/4x \cdot N$ if $N \geq 10$	$1/4x \cdot N$	$1/4x \cdot N$ if $N \geq 10$	$1/4 \cdot x \cdot N$
Paraguay	None	1–2 months	No changes	0	0	0	0
Peru	1996, 1995, 1991	0	No changes	FUND	No changes	FUND	No changes
Suriname	None	1/4–6 months		$(8\% \text{ wage} + r)$		$(8\% \text{ wage} + r)$	
Trinidad and Tobago	None	2 months		0	0	0	0
Uruguay	None	0	No changes	$x \cdot N$	No changes	0	0
Venezuela	1997	1/4–3 months	No changes	$x \cdot N$	$2x \cdot N$	$x \cdot N$	$2x \cdot N$

Source: Ministries of Labor in Latin America and the Caribbean.

Notes: FUND: A certain fraction of a worker's wage is deposit in an individual account every month. The principal plus the interest can be withdrawn by the worker upon dismissal and in some cases, upon voluntary separation.  $x$  = monthly wages;  $N$  = years of tenure;  $r$  = interest rate of fund.

<sup>a</sup>Workers can choose between getting an unconditional payment after seven years in the firm, or getting a higher indemnity in case of dismissal. Most workers opt for the latter.

Table A.2 Legislation Concerning Indemnities for Dismissal in 1987 and 1999

Country	Date of Reform	Compensation for Dismissal Due to Economic Reasons		To whom do the reforms apply?	Upper limit to compensation for dismissal?	
		1987	1999		1987	1999
Argentina	None	$2/3x \cdot N$ , min 2 months	No changes		Max. lim. in $x$	No changes
Bahamas	None	Negotiable	No changes		No	No changes
Barbados	None	$0.41x \cdot N$ if $N \geq 2$	No changes		3.75 monthly salaries	
Belize	None	$1/4x \cdot N$ if $N > 5$	No changes		Max. 42 weeks	No changes
Bolivia	None	$1x \cdot N$	No changes		No	No changes
Brazil	1988	0.1 · FUND	0.4 · FUND	All workers	No	No changes
Chile	1991	$1x \cdot N$	No changes	All workers	5 monthly salaries	11 monthly salaries
Colombia	1990	$45 \text{ days} + x \cdot N \cdot 0.5$ if $N < 5$ $x \cdot N \cdot 0.66$ if $N \geq 5$ and $N < 10$ $x \cdot N$ if $N \geq 10$	$45 \text{ days} + x \cdot N \cdot 0.5$ if $N < 5$ $x \cdot N \cdot 0.66$ if $N \geq 5$ and $N < 10$ $x \cdot N \cdot 1.33$ if $N \geq 10$	All workers	No	No changes
Costa Rica	None	$x \cdot N$	No changes		8 monthly salaries	No changes
Dominican Republic	1992	$1/2 \cdot x \cdot N$	$.67x \cdot N$ if $N = 1 - 4$ $.74x \cdot N$ if $N \geq 5$	New employees	No	No changes
Ecuador	1991	2 if $N \leq 2$ 4 if $N = 2 - 5$ 6 if $N = 5 - 20$ 12 if $N > 20$	3 if $N \leq 3$ $x \cdot N$ if $N > 3$	All workers	12 monthly salaries	25 monthly salaries
El Salvador	1994	$x \cdot N$ ; 0 if bankruptcy	$x \cdot N$ ; changes in max. $x$	All workers	Max. base wage = 4 min. wages	No changes
Guatemala	None	2 days-4 months if bankruptcy; $x \cdot N$ otherwise	No changes		No	No changes

(continued)

Table A.2 (continued)

Country	Date of Reform	Compensation for Dismissal Due to Economic Reasons		To whom do the reforms apply?	Upper limit to compensation for dismissal?	
		1987	1999		1987	1999
Guyana	1997	Negotiable in practice, 2 1/2 weeks per $N$	$1/4x \cdot N$ if $N = 1-5$ $1/2x \cdot N$ if $N = 5-10$	All workers	No	12 monthly salaries
Honduras	None	$x \cdot N$	No changes		15 monthly wages	No changes
Jamaica	None	$1/3x \cdot N$ if $x = 2-5$ $1/2x \cdot N$ if $x > 5$	No changes		No	No changes
Mexico	None	$2/3x \cdot N$ (min. $3 \cdot x$ )	No changes		No	No changes
Nicaragua	1996	Negotiated in practice, $2x \cdot N$	$x \cdot N$ if $N = 1-3$ $3x \cdot N + 2/3x \cdot N$ if $N > 3$		No	5 monthly salaries
Panama	1995	$x \cdot N$ if $N \leq 1$ $3x$ if $N = 2$ $3x + 3/4x \cdot N$ if $N > 2 < 10$ $9x + 1/4x \cdot N$ if $N \geq 10$	$3/4x \cdot N$ if $N < 10$ $7.5x + 1/4x \cdot N$ if $N \geq 10$	New employees	No	No changes
Paraguay	None	$1/2x \cdot N$	$1/2x \cdot N$		No	No changes
Peru	1996, 1995, 1991	$3x \cdot N$	$1.5 \cdot x \cdot N$	All workers	12 monthly salaries	No changes
Suriname	None	Negotiated	Negotiated		No	No changes
Trinidad	None	$1/3x \cdot N$ if $N = 1-4$ $1/2x \cdot N$ if $N > 5$	No changes		No	No changes
Uruguay	None	$x \cdot N$	No changes		6 monthly salaries	No changes
Venezuela	1997	$2/3-2x \cdot N$	$x \cdot N$	All workers	No	5 monthly salaries

Source: Ministries of Labor in Latin America and the Caribbean.

Notes: FUND: A certain fraction of a workers' wage is deposit in an individual account every month. The principal plus the interest can be withdrawn by the worker upon dismissal and in some cases, upon voluntary separation.

1996. Tables A.1 and A.2 only report the schedule as in 1990 and in 1999. See Saavedra and Torero (chap. 2 in this volume) for a more detailed description of the changes in the Peruvian labor code throughout the 1990s.

### Seniority Pay

Seniority payments only exist in Latin America. There are two kinds. In Brazil, Colombia, Ecuador, and Peru, workers deposit 1/12 of their monthly wages in individual accounts. In this case, seniority pay is computed as

$$\text{SenP} = \sum_{i=0}^T \beta^i,$$

where  $T = 20$ . This reflects the discounted value of a stream of payments equivalent to one month of pay per year. For Colombia, Kugler (chap. 3 in this volume) reports that before the 1990 labor reform, workers were entitled to one month of salary per year of work as a seniority fund upon separation independent of the cause of separation. However, partial withdrawals were allowed and deducted in nominal terms from the final payment, implying a “double retroactivity” with an estimated cost of 35 percent of the total payments of seniority pay in the manufacturing sector. We therefore apply a surcharge of 35 percent to the legislated schedule for seniority pay during the period before 1990.

Instead, in Venezuela and Panama, labor codes mandate a mandatory seniority payment that is computed as multiples of the last wage per year of work. In those cases, seniority pay is computed as

$$\text{SenP} = \sum_{i=1}^T \delta^{i-1} (1 - \delta) (\alpha_j \cdot i),$$

where  $\alpha_j$  denotes multiples of the last wage, and  $i$  denotes tenure at the firm. In Venezuela, the legal codes specified a seniority pay of one monthly wage per year of work ( $\alpha_j = 1$ ). After the 1997, seniority pay was increased to two monthly wages per year of work ( $\alpha_j = 2$ ). Notice that this formula assumes that the probability of worker turnover is identical to the probability of job turnover. Because, in general, worker turnover rates tend to be higher than job turnover rates, we also experimented with a probability of worker turnover equal to two times and three times the probability of job turnover. The cost of seniority pay declines with the rate of turnover (because the probability of surviving in the firm and obtaining larger amounts declines). Our estimated results are robust to different assumptions in the worker turnover rate.

### Social Security Regulations

Information provided by *Social Security Programs Throughout the World* (United States Social Security Administration 1983–1999). Social

Table A.3 Definitions and Sources of Variables Used in Section 5

Variable	Source	Description
Employment/Population	OECD Statistics and Household Surveys Data from Latin America	OECD: Employment to population. Data refers to people 15 and over, but in some countries, data refers to people who are between 15 and 66 (Denmark), 15 and 74 (Finland, Hungary), 16 and 17 (Iceland, Norway), 16 and 64 (Sweden), or 16 and older (Spain, United Kingdom, United States). See the methodological notes of labor force statistics at <a href="http://www.oecd.org">www.oecd.org</a> . National and/or European Labour Force Surveys are the main source for the Labor Force Statistics database. Latin America: Computed directly from Household Survey Data for the countries, years and sources listed in table A.4. Employment to population rate for workers 15–65. Are considered employed all workers that declared having a job in the week of reference. It also includes unpaid workers. National data except in Argentina, Bolivia, and Uruguay.
Unemployment	OECD Statistics and Household Surveys Data from Latin America	OECD: Unemployment rate of people 15–64. National and/or European Labour Force Surveys are the main source for the Labor Market Statistics indicator (LMSI) database, OECD. Latin America: Percent of the labor force 15–65 that did not work in the period of reference but are actively looking for a job. National data except in Argentina, Bolivia, and Uruguay.
GDP growth	World Bank Development Indicators (2001)	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 1995 U.S. dollars. GDP measures the total output of goods and services for final use occurring within the domestic territory of a given country, regardless of the allocation to domestic and foreign claims.

GDP per capita, PPP (current international \$)	World Bank Development Indicators (2001)	GDP per capita based on purchasing power parity (PPP). GDP PPP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar in the United States. GDP measures the total output of goods and services for final use occurring within the domestic territory of a given country, regardless of the allocation to domestic and foreign claims.
Share of WAP 25–54	United Nations Population Fund (1998)	Share of working age population 15 to 64 that are between 25 to 54 years old
Share of WAP 55–64	United Nations Population Fund (1998)	Share of working age population 15 to 64 that are 55 or older
Advance notice (AN)	Own construction	Expected discounted cost of providing mandatory AN measured in multiples of monthly wages
Indemnities for dismissal (ID)	Own construction	Expected discounted cost of providing mandatory ID measured in multiples of monthly wages
Seniority pay (SenP)	Own construction	Expected discounted cost of providing SenP measured in multiples of monthly wages
Social Security contributions (SSC)	Own construction	Expected discounted cost of providing mandatory advance notice measured in multiples of monthly wages
Social Security contributions (ss)	U.S. Social Security Administration (1983–1999)	Per period cost of SSC measures as a percent of monthly wages

Table A.4 Countries and Years Included in Baseline Specification

Country	Years	N	Source of Employment and Unemployment Data
Argentina	1996, 1998, 1999	3	Encuesta Permanente de Hogares
Australia	1983–1999	17	Labor Force Statistics, OECD
Austria	1983–1999	17	Labor Force Statistics, OECD
Belgium	1983–1988	16	Labor Force Statistics, OECD
Bolivia	1986, 1990, 1993, 1995, 1996, 1997, 1999	7	Encuesta Continua de Hogares/Condiciones de Vida
Brazil	1983, 1986, 1988, 1992, 1993, 1995–1999	10	Pesquisa Nacional de Amostra de Domicilios
Canada	1983–1999	17	Labor Force Statistics, OECD
Chile	1987, 1990, 1992, 1994, 1996, 1998	6	Encuesta de Caracterización Socioeconómica Nacional
Colombia	1990, 1991, 1993, 1995, 1996–1999	8	Encuesta Nacional de Hogares
Costa Rica	1981, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1998	9	Encuesta Nacional de Hogares
Dominican Rep.	1996, 1998	2	Encuesta Nacional de Fuerza de Trabajo
El Salvador	1995, 1997, 1998	3	Encuesta de Hogares de propósitos múltiples
Finland	1983–1999	17	Labor Force Statistics, OECD
France	1983–1999	17	Labor Force Statistics, OECD
Germany	1992–1999	8	Labor Force Statistics, OECD
Greece	1983–1993	11	Labor Force Statistics, OECD
Honduras	1989, 1992, 1996, 1997, 1998, 1999	6	Encuesta Permanente de Hogares de Propósitos Múltiples
Ireland	1983–1999	17	Labor Force Statistics, OECD
Italy	1983–1999	17	Labor Force Statistics, OECD
Japan	1983–1999	17	Labor Force Statistics, OECD

Korea	1991–1999	9	Labor Force Statistics, OECD
México	1984, 1989, 1992, 1994, 1996, 1998	6	Encuesta Nacional de Ingreso Gasto de los Hogares
Netherlands	1983–1992, 1997	11	Labor Force Statistics, OECD
New Zealand	1991–1999	9	Labor Force Statistics, OECD
Nicaragua	1993, 1998	2	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida
Norway	1983–1999	17	Labor Force Statistics, OECD
Panama	1991, 1995, 1997, 1998, 1999	5	Encuesta continua de Hogares
Paraguay	1995, 1998	2	Encuesta de Hogares
Peru	1985, 1991, 1994, 1996, 1997, 1998	6	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida
Poland	1991–1998	8	Labor Force Statistics, OECD
Portugal	1983–1999	17	Labor Force Statistics, OECD
Spain	1983–1999	17	Labor Force Statistics, OECD
Sweden	1983–1999	17	Labor Force Statistics, OECD
Switzerland	1983–1999	17	Labor Force Statistics, OECD
Turkey	1991–1999	9	Labor Force Statistics, OECD
United Kingdom	1987–1999	13	Labor Force Statistics, OECD
United States	1983–1999	17	Labor Force Statistics, OECD
Uruguay	1989, 1992, 1995, 1997, 1998	5	Encuesta Continua de Hogares
Venezuela	1983, 1986, 1989, 1993, 1995, 1997–1999	8	Encuesta de Hogares por Muestra

Notes: See table 8 (col. [1]). Number of observations = 417.

security contributions include contributions by employers and employees to old age, disability and death, sickness and maternity, work injury, unemployment insurance, and family allowances programs. Because this information is only available biannually, we extend the data to yearly frequency in two alternative ways—by interpolating or by inputting each missing data value with the value in the former year. The results of our empirical analysis do not vary with the method used. The results also do not vary when we consider only the original biannual data.

For Argentina, we obtained direct information from the country. Rates apply to Buenos Aires. In all countries, we consider the rates applied to wage earners. We do not include contributions made by the government to fund social security programs. In cases where contributions differ across individuals, states, or industry risk, only one rate is chosen, and the choice varies somewhat across countries. However, the same criterion is used within countries across time. This somewhat reduces cross-country comparability but preserves across time comparability within countries.

### Social Security Reform

The variable Reform takes a value of 1 after a country has implemented a social security reform that totally or partially replaces a pay-as-you-go system by an individual capitalization system. Based on social security reforms information summarized in Lora and Pagés (2000), this variable takes the value of 1 in Chile on and after 1981, in Colombia on and after 1994, in Argentina on and after 1994, in Uruguay on and after 1996, in Mexico and Bolivia on and after 1997, and in El Salvador on and after 1998.

## Appendix B

### *Dynamic Demand Specifications*

All of the papers on labor demand in this volume ignore the asymmetric nature of labor adjustment costs. In this appendix, we explore the consequences of this asymmetry on labor demand. The main conclusion is that static and dynamic costs of labor have separate effects on labor demand, and in general no scalar index adequately summarizes these costs. In order to specify labor demand functions in the presence of asymmetric hiring and firing costs, it is convenient to use a two-period model. Such a model is implicit in Kugler (chap. 3 in this volume). Let  $f(\ell)$  denote output as a function of labor input  $\ell$ . Let  $\theta$  be a second period productivity shock. It is

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normalized against a first-period productivity shock of 1. We assume, for simplicity, that workers do not quit once they are hired.

Labor hired in period one is  $\ell_1$ . Labor employed in period two is  $\ell_2 = \ell_1 + \Delta$ .  $\Delta$  is thus the change in the stock of period-one labor. Spot wage  $W$  is assumed to be common in both periods, and is assumed to be exogenous to the firm. The cost of firing a worker is  $C$ . Offsetting this cost is the saving in wages. The cost of hiring a worker is the wage. Asymmetry arises when  $C \neq 0$ . Assume no discounting. Labor  $\ell_1$  is kept on in period two unless second-period demand shocks ( $\theta$ ) are sufficiently low. The firm maximizes profits

$$(B1) \quad f(\ell_1) - W\ell_1 + E[\theta f(\ell_1 + \Delta) - W(\ell_1 + \Delta) - C \text{Max}(-\Delta, 0)],$$

where the first-period labor productivity is normalized to 1.

We assume that the support of  $\theta$  is  $(0, \infty)$  and that  $\theta$  is an (absolutely continuous) random variable. If  $\theta \geq 1$  with probability 1, the firm in the second period wants  $\Delta \geq 0$ . Labor productivity has increased when  $\theta$  is bigger than its first-period value, which implicitly is set at 1.

The presence of second-period firing costs inhibits hiring in the first period. Thus, anticipating the possibility of an adverse shock in the second period, the firm hires less labor than it would hire in the first period in the absence of firing costs. If, for the sake of making an heuristic argument, we characterize the firm as myopically maximizing period-by-period profits, the firm acts as if the first-period productivity shock is less than 1 in making its first-period decisions and hires less labor than it would if there were no second-period firing costs. Letting  $\bar{\theta}$  be the value of the ‘‘as if’’ first-period productivity shock, if  $\theta > \bar{\theta}$  in period two, then  $\theta f'(\ell_2) = W$  and  $\ell_2 = [f']^{-1}(W/\theta) > \ell_1$ .

If  $\theta = \bar{\theta}$ , the firm stays put at  $\ell_1$  so that  $\ell_1 = \ell_2$  and  $\Delta = 0$ . If productivity is below  $\bar{\theta}$ , the firm may still keep its workforce at  $\ell_1 = \ell_2$  because it is costly to fire labor. We now determine the lower bound on  $\theta$  that gives rise to inaction. For a fixed  $\ell_1$ , the two required conditions for inaction ( $\Delta = 0$ ) are  $\theta f'(\ell_1) < W$ , so it pays in gross terms to get rid of a unit of  $\ell_1$ , and  $\theta f'(\ell_1) > W - C$ , so it does not pay in net terms. Thus the inequalities determining the zone of inaction are (for a given  $\ell_1$ )

$$W - C \leq \theta f'(\ell_1) \leq W.$$

The lower boundary  $\theta^*$  is  $(W - C)/(f'(\ell_1)) = \theta^*$ . Holding  $\ell_1$  fixed, raising  $C$  lowers the threshold  $\theta^*$ . Thus the zone of inaction for a given  $(\ell_1, C)$  is  $\theta^* \leq \theta \leq \bar{\theta}$ , where  $\bar{\theta} = W/(f'(\ell_1))$ .

The first order condition for  $\ell_1$  is  $f'(\ell_1) - W + E(\theta f'(\ell_1 + \Delta) - W) = 0$ , where  $\Delta = 0$  if  $\theta^* \leq \theta \leq \bar{\theta}$ ,  $\Delta < 0$  if  $\theta < \theta^*$ , and  $\Delta > 0$  if  $\theta > \bar{\theta}$ . From concavity,  $\ell_1$  is decreasing in cost  $C$ . Intuitively, firms with high firing costs hold back on hiring  $\ell_1$ . There is an option value of holding back on hiring

$\ell_1$  to avoid the cost of firing unwanted second-period labor. In order to characterize  $\ell_1$ , we must first characterize  $\Delta(\ell_1)$ .

### Second-Period (Conditional on $\ell_1$ ) Demand Functions

Letting  $\Delta^-$  denote the reduction in the stock of labor and  $\Delta^+$  be the expansion of such stock, we obtain the first-order condition for  $\Delta^-$  as

$$\theta f'(\ell_1 + \Delta^-) = W - C$$

or

$$\ell_1 + \Delta^- = (f')^{-1}\left(\frac{W - C}{\theta}\right).$$

Take  $\ell_1$  as given. Observe that if  $0 < \theta < \theta^*$ ,  $\Delta < 0$ . Define  $\varphi \equiv f'^{-1}$ . Observe that from concavity  $\varphi' < 0$ . Then

$$\ell_1 + \Delta^- = \varphi\left(\frac{W - C}{\theta}\right).$$

Observe that at  $\theta = \theta^*$ ,  $\Delta^- = 0$ . If  $\theta > \bar{\theta}$ ,  $\theta f'(\ell_1 + \Delta^+) = W$  and  $(\ell_1 + \Delta^+) = \varphi(W/\theta)$ . If  $\theta^* < \theta < \bar{\theta}$ , the firm operates at  $\ell_1$  and  $\Delta = 0$ . If  $\theta < \theta^*$ ,  $\theta f'(\ell_1 + \Delta^-) = W - C$  and  $\ell_1 + \Delta^- = \varphi[(W - C)/\theta]$ . Define  $g(\theta)$  as the density of  $\theta$ . Given  $\ell_1$ , expected demand in period two (averaged over the  $\theta$  states) is, for a given firm,

$$E(\ell_2 | W, C, \ell_1) = \int_0^{\theta^*} \varphi\left(\frac{W - C}{\theta}\right) g(\theta) d\theta + \ell_1 \int_{\theta^*}^{\bar{\theta}} g(\theta) d\theta + \int_{\bar{\theta}}^{\infty} \varphi\left(\frac{W}{\theta}\right) g(\theta) d\theta.$$

Thus

$$\begin{aligned} \frac{\partial E(\ell_2 | W, C, \ell_1)}{\partial W} &= \frac{\partial \theta^*}{\partial W} \varphi\left(\frac{W - C}{\theta^*}\right) g(\theta^*) + \int_0^{\theta^*} \frac{1}{\theta} \varphi'\left(\frac{W - C}{\theta^*}\right) g(\theta) d\theta \\ &\quad + \int_{\bar{\theta}}^{\infty} \left(\frac{1}{\theta}\right) \varphi'\left(\frac{W}{\theta}\right) g(\theta) d\theta + \ell_1 \left[ \frac{\partial \bar{\theta}}{\partial W} g(\bar{\theta}) - \frac{\partial \theta^*}{\partial W} g(\theta^*) \right] \\ &\quad - \left( \frac{\partial \bar{\theta}}{\partial W} \right) \varphi\left(\frac{W}{\bar{\theta}}\right) g(\bar{\theta}), \\ \frac{\partial E(\ell_2 | W, C, \ell_1)}{\partial C} &= \left( \frac{\partial \theta^*}{\partial C} \right) \varphi\left(\frac{W - C}{\theta^*}\right) g(\theta^*) - \int_0^{\theta^*} \frac{1}{\theta} \varphi'\left(\frac{W - C}{\theta}\right) g(\theta) d\theta \\ &\quad + \ell_1 \left[ \frac{\partial \bar{\theta}}{\partial C} g(\bar{\theta}) - \frac{\partial \theta^*}{\partial C} g(\theta^*) \right] - \frac{\partial \bar{\theta}}{\partial C} \varphi\left(\frac{W}{\bar{\theta}}\right) g(\bar{\theta}). \end{aligned}$$

Using the demand function,  $\varphi[(W - C)/\theta^*] = \ell_1$ , and  $\varphi(W/\bar{\theta}) = \ell_1$ ,

$$\frac{\partial E(\ell_2 | W, C, \ell_1)}{\partial W} = \int_0^{\theta^*} \frac{1}{\theta} \varphi'\left(\frac{W - C}{\theta}\right) g(\theta) d\theta + \int_{\bar{\theta}}^{\infty} \frac{1}{\theta} \varphi'\left(\frac{W}{\theta}\right) g(\theta) d\theta < 0,$$

and

$$\frac{\partial E(\ell_2 | W, C, \ell_1)}{\partial C} = -\int_0^{\theta^*} \frac{1}{\theta} \phi' \left( \frac{W}{\theta} \right) g(\theta) d\theta > 0.$$

The positivity of this final expression arises from the fact that as  $C$  increases, the firm is more risk averse ( $\theta^*$  falls) so that it is more likely that it hires labor in the second period.

If  $\theta$  is iid across firms in period 2, and independently and identically distributed (i.i.d.) across time, then the mean conditional (on  $\ell_1$ ) labor demand function is not a direct function of  $W + \Pr(0 < \theta < \theta^*)C$ , which, in this simple framework, is the measure of labor cost used in Heckman and Pagés (2000) and in the empirical analysis of section I.5. In fact, the model predicts that

$$\frac{\partial E(\ell_2 | W, C, \ell_1)}{\partial W} + \frac{\partial E(\ell_2 | W, C, \ell_1)}{\partial C} < 0$$

so that  $\partial E(\ell_2 | W, C, \ell_1) / \partial W$  is larger in absolute value than  $\partial E(\ell_2 | W, C, \ell_1) / \partial C$ , although they are of opposite signs.

This analysis suggests that empirical specifications of labor demand functions should use  $C$  and  $W$  separately.  $W$  corresponds to static costs as defined in the text.  $C$  corresponds to costs of adjustment. The OLS regressions of conditional (on  $\ell_1$ ) demand functions do not identify the standard substitution terms used in static demand analysis.

One way to avoid problems with direct estimation of labor demand functions is to estimate production functions. These can be used to derive the demand functions given fixed costs without directly estimating demand functions with fixed costs.

### First-Period Demand Functions

These are obtained by substituting each state-contingent  $\ell_2 = \ell_1 + \Delta$  demand function into expression (B1) and maximizing with respect to  $\ell_1$ . As in the analysis of the second period demand function,  $W + \Pr(0 < \theta < \theta^*)C$  is not an appropriate marginal price in any state. Substituting into expression (B1) and making the dependence of  $\Delta^-$  and  $\Delta^+$  on  $W, C, \ell_1$  explicit, we obtain total profits (as perceived in the first period) as

$$\begin{aligned} & f(\ell_1) - W\ell_1 \\ & + \int_0^{\theta^*} \{ \theta f[\ell_1 + \Delta^-(W, C, \ell_1, \theta)] - (W - C)\Delta^-(W, C, \ell_1) - W\ell_1 \} g(\theta) d\theta \\ & + \int_{\theta^*}^{\bar{\theta}} [\theta f(\ell_1) - W\ell_1] g(\theta) d\theta \\ & + \int_{\bar{\theta}}^{\infty} \{ \theta f[\ell_1 + \Delta^+(W, C, \ell_1)] - W[\ell_1 + \Delta^+(W, C, \ell_1)] \} g(\theta) d\theta. \end{aligned}$$

Assuming an interior solution, and using the envelope theorem,

$$f'(\ell_1) - W + \int_0^{\theta^*} \{\theta f'[\ell_1 + \Delta^-(W, C, \ell_1, \theta)] - W\} g(\theta) d\theta \\ + \int_{\theta^*}^{\bar{\theta}} [\theta f'(\ell_1) - W] g(\theta) d\theta = 0,$$

so the first period demand obtained as the solution to this equation  $\ell$  is a function of  $W$  and  $C$  separately and not  $W + \Pr(0 < \theta \leq \theta^*)C$ . Observe, trivially, that the  $\ell_1$  obtained as a solution of this first-order condition is lower than the  $\ell_1$  obtained when  $C = 0$ . This rationalizes our choice of  $\bar{\theta} < 1$  in the heuristic solution outlined above.

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Mandate-Based Health Reform and the Labor Market: Evidence from the Massachusetts Reform  
Jonathan T. Kolstad and Amanda E. Kowalski  
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**ABSTRACT**

We model the labor market impact of the three key provisions of the recent Massachusetts and national “mandate-based” health reforms: individual and employer mandates and expansions in publicly-subsidized coverage. Using our model, we characterize the compensating differential for employer-sponsored health insurance (ESHI) -- the causal change in wages associated with gaining ESHI. We also characterize the welfare impact of the labor market distortion induced by health reform. We show that the welfare impact depends on a small number of “sufficient statistics” that can be recovered from labor market outcomes. Relying on the reform implemented in Massachusetts in 2006, we estimate the empirical analog of our model. We find that jobs with ESHI pay wages that are lower by an average of \$6,058 annually, indicating that the compensating differential for ESHI is only slightly smaller in magnitude than the average cost of ESHI to employers. Because the newly-insured in Massachusetts valued ESHI, they were willing to accept lower wages, and the deadweight loss of mandate-based health reform was less than 5% of what it would have been if the government had instead provided health insurance by levying a tax on wages.

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# 1 Introduction

The 2010 United States national health reform and the 2006 Massachusetts state health reform both focus on expanding health insurance coverage to near-universal levels. These “mandate-based” reforms rely on three key provisions to expand coverage: a mandate that employers offer coverage or pay a penalty, a mandate that individuals obtain coverage or pay a penalty, and expansions in publicly-subsidized coverage. While regulatory policy has long relied on mandates (for example, command and control regulation of technologies to reduce pollution), public policies that mandate that individuals purchase privately-supplied goods have little precedent. As we demonstrate, mandate-based policy has the potential for greater efficiency in achieving policy goals if the individuals who gain insurance through their employers value the coverage that they receive.<sup>1</sup>

In this paper, we model and then estimate the relationship between ESHI and the labor market, allowing us to assess the impact of health reform on welfare. First, we extend the Summers (1989) model of a full-compliance employer mandate to incorporate the key features of the national and Massachusetts health reforms. Using this model, we characterize the compensating differential for ESHI — the causal change in wages associated with gaining ESHI — and we derive a set of sufficient statistics that capture the impact of the reforms on the labor market and on welfare. Although these sufficient statistics arise from a set of potentially complex and difficult-to-measure structural parameters that determine individual health insurance and labor supply decisions, we can recover them from easily measured changes in labor market outcomes. Our extensions of the Summers (1989) model incorporate more sources of variation in labor market outcomes, enriching the model’s empirical content. Furthermore, our extensions allow us to capture interactions between policy provisions. For example, Summers (1989) gives us the intuition that an employer mandate reduces deadweight loss relative to a tax, but that intuition does not hold if there is already an individual mandate in place.

Using variation induced by the Massachusetts health reform — which mirrors the national reform in all of the elements of our model — we estimate the empirical analog of our model. We first estimate the compensating differential for health insurance. Our empirical strategy relies on exogenous shifts into and out of ESHI induced by reform. Using longitudinal data on wages, employment, and hours worked, we study changes in labor market outcomes for individuals who switch to and from ESHI over the reform period. We incorporate variation between Massachusetts and other states to control for national trends, and we incorporate individual fixed effects to control for time-invariant attributes that determine an individual’s labor market outcomes. We also incorporate variation in firm size to allow some firms to be exempt from the employer mandate and to control for variation in the Massachusetts labor market that is unrelated to the reform. Combining all of these sources of variation and the reform allows us to obtain causal estimates of the compensating

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<sup>1</sup>The question of whether the federal government can implement the individual mandate is the critical legal question that has led to court challenges of the national reform. Although the federal government’s authority to tax is not questioned, court challenges focus on its authority to mandate the purchase of a private good under the Commerce Clause. We do not comment on the constitutionality of the individual mandate. Rather, we inform the choice of policy instrument by focusing on the efficiency of mandate-based policy relative to traditional tax-based policy.

differential associated with health insurance.

Building on the estimated compensating differential for health insurance, we estimate the sufficient statistics that determine the welfare impact of health reform. Specifically, our model allows us to recover the cost of ESHI to employers, the underlying worker valuation of ESHI, the labor supply and demand elasticities, and the magnitude of the behavioral responses to the policy parameters of the Massachusetts reform (the employer and individual mandates and subsidies). Once we demonstrate that these parameters are sufficient statistics for welfare analysis, we use our estimates to compute the deadweight loss associated with the mandate-based insurance expansion in Massachusetts. We also compare our estimated deadweight loss to the deadweight loss of a counterfactual tax-based insurance expansion that would involve levying a wage tax to pay for the provision of health insurance directly.

We find a compensating differential for ESHI that is of the expected theoretical sign and slightly smaller in magnitude than the full cost of health insurance, suggesting high average valuation of the benefit among the newly-insured. Consistent with the large decline in wages, we find a small hours differential between jobs with and without ESHI, also suggesting high average valuation of the benefit among the newly insured. Apart from our theoretical contributions, our findings contribute to the empirical literature on the incidence of fringe benefits, with health insurance as the largest of those benefits. Typically, the endogeneity of fringe benefits and labor market outcomes leads researchers to find wrong-signed compensating differentials for fringe benefits (see Gruber (2000) and Currie and Madrian (1999) for reviews); most studies find that individuals who receive more fringe benefits also receive higher wages. Existing studies that do not find wrong-signed compensating differentials for health insurance rely on *incremental* changes in the cost of health insurance, such as premium increases due to the addition of mandated maternity benefits (Gruber (1994)) or increasing malpractice costs (Baicker and Chandra (2005)). By using variation from the Massachusetts reform, we find a compensating differential for the *full* cost of health insurance; individuals who receive ESHI receive wages that are lower by approximately the amount their employer spends on ESHI.

Translating our estimated compensating and hours differentials into sufficient statistics for welfare analysis, we find that mandate-based reform is a relatively efficient way to expand coverage. Our main estimate suggests that mandate-based coverage expansion in Massachusetts resulted in a deadweight loss due to distortion of the labor market that was only 5% of the distortion associated with instead providing health insurance through a tax on wages. We examine the robustness of our estimates to a variety of alternative specifications. Although our estimates vary, they always show that that mandate-based reform is substantially more efficient than tax-based reform because our finding that individuals value ESHI is very robust.

The paper proceeds as follows: Section 2 discusses the provisions of Massachusetts and national reforms that are likely to affect the labor market. Based on these provisions, Section 3 develops a theory of mandate-based health reform that we use to characterize the compensating differential for ESHI and the welfare impact of mandate-based health reform relative to tax-based health reform; Sections 4 and 5 discuss identification and estimation of the model. Section 6 introduces the data.

Section 7 presents results and discusses robustness, and Section 8 concludes.

## 2 Massachusetts Health Reform, the ACA, and the Labor Market

The Massachusetts health reform, passed in April 2006, and the federal Patient Protection and Affordable Care Act (the “ACA”), passed in March 2010, contain a number of similar provisions that are likely to affect the labor market. We provide a side-by-side comparison in Appendix A. First, both reforms include a “pay-or-play” employer mandate, which requires employers to offer health insurance or pay a penalty. Unlike traditional full-compliance mandates, pay-or-play mandates allow for noncompliance and an associated penalty. The Massachusetts reform requires employers with 11 or more full-time employees to offer their workers the option to purchase health insurance coverage. Health coverage options must, at minimum, include a plan that allows employees to purchase health insurance using pre-tax wages and employers must contribute at least 33% of the value of the premium or they will be assessed a penalty. This penalty is equal to \$295 per employee per year. Compliance has been high. Only approximately 4.6% of employers large enough to be subject to the penalty (0.5% of all employers) paid it from 2007 to 2010 (Massachusetts DHCFP (2011b)).<sup>2</sup>

The ACA incorporates a similar pay-or-play employer mandate, but it defines large employers as those with 50 or more full-time employees (Kaiser Family Foundation (2010a)). The ACA also requires that coverage options be affordable, such that the insurance offered pays at least 60% of covered expenses and the employee is not required to pay more than 9.5% of family income for individual coverage (Burkhauser et al. (2011)). If the employer does not offer options for coverage, the penalty assessed is \$2,000 per full-time employee, excluding the first 30 employees. If the options do not meet the definition of affordable, the employer must pay \$3,000 for any employees who enroll in insurance via an exchange and receive a tax credit, also excluding the first 30 employees (Kaiser Family Foundation (2010)).

The second keystone of both reforms is the individual mandate to purchase insurance. The Massachusetts health reform incorporated an individual mandate requiring nearly all residents to purchase health insurance deemed to meet or exceed a specific value (called “minimum creditable coverage”), or pay a penalty if they could have purchased affordable coverage but did not.<sup>3</sup> The penalty in Massachusetts for those who are unable to demonstrate they have coverage when they

<sup>2</sup>In addition, employers are subject to a separate “free rider surcharge” penalty if they do not offer a plan that allows employees to purchase health insurance using pre-tax wages and instead an employee receives care through the state’s uncompensated care pool. The compliance cost for employers to avoid this penalty is minimal — they need only set up a plan without contributing anything to it. Accordingly, zero employers were liable for the free rider surcharge in fiscal years 2008 and 2009 (Massachusetts DHCFP (2011a)).

<sup>3</sup>See Kaiser Family Foundation (2009) and Raymond (2007). Individuals are automatically exempt from the individual mandate penalty in Massachusetts if they have a gap in creditable coverage of three months or less in a given calendar year, if they claim a religious exemption, or if their annual income is under 150% of the Federal Poverty Level (effectively because the lowest cost Connector plan would be free for them). Other individuals can file for an exemption based on affordability using the Certificate of Exemption Application, which also provides details on the definition of “minimum creditable coverage.” (The application is available at <https://www.mahealthconnector.org/portal/binary/com.epicentric.contentmanagement.servlet.ContentDeliveryServlet/FindInsurance/Individual/Affordability2520Calculator/2011CertificateofExemption.pdf> accessed December 1, 2011.)

file their taxes is equal to 50% of the cost of the least generous (Bronze) plan available in the Massachusetts health insurance exchange (the Connector).<sup>4</sup> Compliance with the individual mandate in Massachusetts has been high — over 97% of tax filers submitted the tax form to comply with the individual mandate in 2008, and less than 2% reported any spell of uninsurance (Massachusetts Health Connector and Department of Revenue (2010)). The ACA has similar requirements, mandating that individuals purchase qualifying coverage or pay penalties, which will be phased in beginning in 2014. The ACA penalty is the higher of \$695 per uninsured member of the household (up to three) or 2.5% of household income.

The third cornerstone of both reforms is the establishment of subsidized coverage for those with incomes too high to qualify for fully subsidized Medicaid coverage. In Massachusetts, this coverage is offered by the state at no premium to those with incomes below 150% of the federal poverty level (FPL) (\$27,795 for a family of three in 2011).<sup>5</sup> Those earning less than 100% of FPL have access to traditional Medicaid (MassHealth) or fully subsidized CommCare, depending on categorical eligibility. Individuals between 100 and 150% of FPL receive CommCare coverage but do not pay a premium. Individuals between 150 and 300% of FPL (\$27,795 to \$55,590 for a family of three) can purchase coverage through the Connector (CommCare plans) with subsidies that decline with income. Similarly, the ACA expands Medicaid eligibility to all those with incomes below 133% of poverty (\$24,707 for a family of three).<sup>6</sup> It also extends subsidized coverage higher up the income distribution to 400% of poverty (\$74,120 for a family of three).

### 3 A Model of Mandate-Based Health Reform and the Labor Market

In this section, we incorporate the three key features of the ACA and the Massachusetts reform into a model of mandate-based health reform and the labor market. Using our model, we characterize the compensating differential for health insurance and the welfare impact of health reform. Our model extends the model pioneered by Summers (1989) (hereafter called the “Summers model”) and subsequently used by Gruber and Krueger (1991), Gruber (1994), Buchmueller et al. (2011), and Anand (2011), among others. Our extensions capture the salient features of the Massachusetts and national reforms that affect the labor market, bringing the model closer to actual policy. By taking all of the key features of the Massachusetts and national reforms into account, we enrich the empirical content of the model and contribute to the literature on the impact of health reform

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<sup>4</sup>According to the Massachusetts Connector website in 2010, in the zip code 02138 (Cambridge, MA), the cost of a Bronze plan for a family in Cambridge with two 40-year-old parents was \$11,000 annually. For a couple with two individuals aged 35, the Bronze plan cost \$6,600 annually. A 31-year-old purchasing a Bronze would expect to pay \$2,868.

<sup>5</sup>In the 48 contiguous states and the District of Columbia, the 2011 poverty line is \$10,890 for a single individual, and it grows by \$3,820 for each additional family member (Federal Register (2011)).

<sup>6</sup>Effectively, eligibility will be extended to 138% of poverty because there is a special deduction of income under 5% of poverty (Kaiser Family Foundation (2010a)).

on the labor market.<sup>7</sup> These extensions also allow us to capture the interactions between policies yielding additional insight. Specifically, we explore the intuition that an employer mandate reduces deadweight loss relative to a tax and find that it does not hold if there is already an individual mandate in place.

### 3.1 The Model

We begin by characterizing labor supply and demand when some firms do and others do not provide ESHI. A representative firm sets wages to maximize profits, resulting in the following labor demand function:

$$L_D^t = L_D^{ESH I,t}(w + b)ESH I_t + L_D^{NoESH I,t}(w + \rho_t b)(1 - ESH I_t).$$

Willingness to demand hours of work  $L$  in period  $t$  is a function  $L_D^{ESH I,t}$  or  $L_D^{NoESH I,t}$  of the monetary hourly wage  $w$ , and other arguments, depending on an indicator for whether the firm provides health insurance  $ESH I_t$  at time  $t$ , which is exogenous for now.<sup>8</sup> If the firm provides health insurance, labor demand depends solely on the cost of employing an individual in dollar terms — wages and the dollar cost to the employer of a standard health insurance benefit  $b$ . If the firm does not provide health insurance, labor demand depends on the wage and the per-worker penalty  $\rho_t b$  for not complying with the employer mandate.

A representative individual chooses how many hours to work to maximize utility, resulting in the following labor supply function:

$$L_S^t = L_S^{ESH I,t}(w + \alpha b + \lambda_t b - \mu_{xt} b)ESH I_t + L_S^{NoESH I,t}(w)(1 - ESH I_t).$$

Willingness to supply hours of work  $L$  in period  $t$  is a function  $L_S^{ESH I,t}$  or  $L_S^{NoESH I,t}$  of the hourly wage  $w$ . For an individual with ESHI, given by the indicator  $ESH I_t$ , which is exogenous for now, labor supply is also a function of the cost to the employer for a standard health insurance benefit  $b$ , scaled by the amount that an individual values a dollar of ESHI relative to a dollar of wages,  $\alpha$ , and policy parameters in place at time  $t$ : the individual penalty for not having health insurance  $\lambda_t$ , and the subsidy  $\mu_{xt}$  available on the individual health insurance market, which varies in generosity based on income group  $x$ . In the individual's choice problem, several factors can affect the underlying valuation of ESHI relative to a dollar of wages  $\alpha$ . For example, canonical insurance theory demonstrates that willingness to pay for insurance is determined by an individual's wealth, health risk, risk preferences, and the available insurance contract (see Arrow (1963) and Rothschild and Stiglitz (1976)). Furthermore, there is a tax preference for ESHI, so we expect an individual's marginal tax rate to affect his willingness to pay for ESHI. Rather than modeling these factors individually, we model only  $\alpha$ , which is a sufficient statistic for welfare analysis in the spirit of

<sup>7</sup>Krueger and Kuziemko (2011) consider the implications of the ACA on coverage for the uninsured, Pohl (2011) considers the implications of the ACA for the labor supply of single mothers, and Heim and Lurie (2012) consider the implications of the Massachusetts reform for the self-employed.

<sup>8</sup>We develop the model relying on the simplifying assumption that we can measure  $L$  in hours of work, ignoring the potential difference between the extensive and intensive margin of employment. We relax this assumption in our empirical implementation.

Chetty (2009). If the worker values ESHI, he is willing to work for lower wages in a job that provides ESHI, and  $\alpha$  captures the full magnitude of the downward shift in the individual's supply curve in the absence of an individual penalty or a subsidy.

The individual penalty augments the individual's underlying valuation of ESHI, shifting his labor supply curve further downward — even if the individual does not value health insurance on its own merits, he will value it at least as much as the penalty that he must pay for not having it. We generally expect  $\alpha + \lambda \leq 1$ .<sup>9</sup> A subsidy, like the individual mandate, only affects an individual's labor supply if he does obtain health insurance through his employer. However, in the face of a penalty, he is more willing to work for ESHI instead of wages; in the face of a subsidy for health insurance outside of employment, he is less willing to work for ESHI instead of wages. In addition to examining the underlying valuation, the penalty, and the subsidy individually, we can capture the entire shift in the labor supply curve associated with ESHI. The resulting sum,  $\alpha + \lambda - \mu_x$ , which we call the “penalty-and-subsidy-inclusive valuation” is an important sufficient statistic for our analysis.

The inclusion of intertemporal variation (indexed by  $t$ ) in the model captures the impact of introducing health reform, allowing assessment of changes in policy as well as tying the model to the empirical setting. We model the impact of health reform by specifying two values of  $t$ : *Before* and *After*. The employer mandate, the individual mandate, and the subsidies are not in place before reform such that  $\rho_{Before} = \lambda_{Before} = \mu_{x,Before} = 0$ , but they are in place after reform such that  $\rho_{After} = \rho$ ,  $\lambda_{After} = \lambda$ , and  $\mu_{x,After} = \mu_x$ . The policy parameters of health reform are the only time-varying elements of the model.

Figure 1 depicts a graphical representation of the model, assuming that  $L_D^{ESHI,t}$  and  $L_D^{NoESHI,t}$  have the same linear functional form and that  $L_S^{ESHI,t}$  and  $L_S^{NoESHI,t}$  have the same linear functional form (the linear functional form is an approximation to a general nonlinear functional form). The labor market equilibrium  $(w, L)$  in period  $t$  is the intersection of labor supply and labor demand. There are two potential equilibria in each period  $t$ , conditional on whether the individual

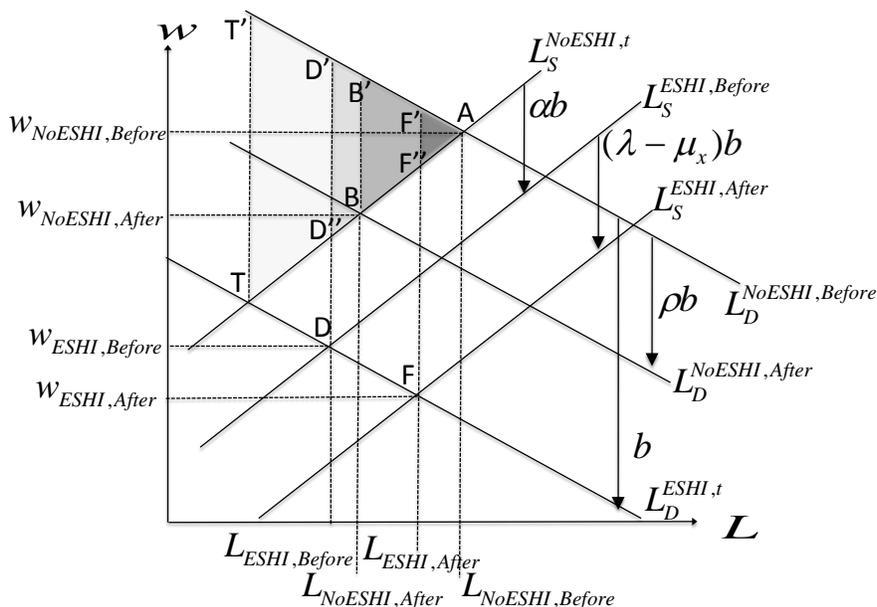
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<sup>9</sup>We do not expect the individual penalty to increase the total valuation of health insurance for an individual who already values it fully. Therefore, we specify that the magnitude of  $\lambda$  is affected by the underlying valuation  $\alpha$  and the statutory penalty  $\Lambda$  as follows:

$$\lambda = \begin{cases} \Lambda, & \text{for } \alpha \leq 1 - \Lambda \\ 1 - \alpha, & \text{for } 1 - \Lambda \leq \alpha \leq 1 \\ 0, & \text{for } \alpha > 1 \end{cases}$$

In the first case,  $\alpha$  is small, so  $\lambda$  takes on its statutory value, and the penalty-inclusive valuation, which we define as  $\alpha + \lambda$ , is less than 1. In the second case,  $\lambda$  is large enough to augment  $\alpha$  until the penalty-inclusive valuation is full. In the third case, which we see as very unlikely, the individual's underlying valuation of health insurance is higher than the cost to the employer. Such a case could arise if an individual cannot access health insurance outside of employment, perhaps because of pre-existing conditions that are excluded on the individual market. Such a case could also arise if health insurance through the employer is cheaper than other insurance, which is likely because of the tax-preference for employer-sponsored health insurance and because employers have more negotiating power than individuals. In this case, the penalty-inclusive valuation of health insurance is his underlying valuation, and the penalty has no impact. We define the subsidy similarly so that it cannot reduce an individual's penalty-and-subsidy-inclusive valuation beyond zero.

Figure 1: Graphical Model



receives health insurance through the employer:  $D$  and  $A$  are the equilibria for individuals with and without ESHI before the reform, respectively;  $F$  and  $B$  are the equilibria for individuals with and without ESHI after the reform, respectively.

The Summers model is a special case of our model with only two equilibria and a different policy intervention. Before the policy intervention, there is only one equilibrium at  $A$  — no jobs include ESHI. The policy intervention consists of a mandate that all employers must provide health insurance, and it is not a pay-or-play mandate, so there is full compliance with the mandate. After the policy intervention, there is only one equilibrium at  $D$  — all jobs include ESHI.

### 3.2 Characterization of the Compensating Differential for ESHI

Using our model, we can characterize the compensating differential for health insurance, defined as the causal difference in wages between jobs with ESHI and jobs without ESHI. We can also characterize the corresponding hours differential using hours lieu of wages. We first characterize the compensating and hours differentials in terms of differences between labor market equilibria, and then we characterize them in terms of sufficient statistics.

The first panel of Table 1 presents the compensating differential for health insurance in terms of differences between equilibria in the first column and sufficient statistics in the third column. The second panel presents the analogous hours differential. These expressions follow directly from the geometry of Figure 1.<sup>10</sup> We represent the slope of the labor supply curve with  $s$  and the slope of the labor demand curve with  $d$  (these slopes become elasticities if we specify  $w$  as the logarithm

<sup>10</sup>To obtain the compensating and hours differentials before the reform, consider  $D'$ . Wages at  $D'$  are equal to  $w_D + b$ . Because  $D'$  and  $A$  are on the demand curve, we can express the slope of the demand curve as the difference in wages at these two points, divided by the difference in hours at these two points:

Table 1: Compensating and Hours Differentials

Compensating Differential	$t$	Sufficient Statistics	Coefficients
$w_D - w_A$	Before - Before	$\frac{s-\alpha d}{d-s} b$	$\beta_8 [ + \beta_{8e} ]$
$w_F - w_B$	After - After	$\frac{(1-\rho)s-(\alpha+\lambda-\mu_x)d}{d-s} b$	$\beta_1 + \beta_8 [ + \beta_{1e} + \beta_{8e} ]$
$w_D - w_B$	Before - After	$\frac{(1-\rho)s-\alpha d}{d-s} b$	$\beta_8 - \beta_{11} [ + \beta_{8e} ]$
$w_F - w_A$	After - Before	$\frac{s-(\alpha+\lambda-\mu_x)d}{d-s} b$	$\beta_1 + \beta_8 + \beta_{11} [ + \beta_{1e} + \beta_{8e} ]$
Hours Differential	$t$	Sufficient Statistics	Coefficients
$L_D - L_A$	Before - Before	$\frac{1-\alpha}{d-s} b$	$\gamma_8 [ + \gamma_{8e} ]$
$L_F - L_B$	After - After	$\frac{1-\rho-(\alpha+\lambda-\mu_x)}{d-s} b$	$\gamma_1 + \gamma_8 [ + \gamma_{1e} + \gamma_{8e} ]$
$L_D - L_B$	Before - After	$\frac{1-\rho-\alpha}{d-s} b$	$\gamma_8 - \gamma_{11} [ + \gamma_{8e} ]$
$L_F - L_A$	After - Before	$\frac{1-(\alpha+\lambda-\mu_x)}{d-s} b$	$\gamma_1 + \gamma_8 + \gamma_{11} [ + \gamma_{1e} + \gamma_{8e} ]$

of wages and  $h$  as the logarithm of hours).

The rows of each panel show different expressions for the compensating and hours differentials, depending on the timing of the comparison between individuals with ESHI and individuals without ESHI. The second column indicates the time periods being compared: the first row is the differential before the reform, the second is the differential after the reform, the third is the differential between those with ESHI before the reform and those without ESHI after the reform, and the fourth is the differential between those with ESHI after the reform and those without ESHI before reform. The differential before the reform is equivalent to the corresponding differential from the Summers model. It is a special case of the other three expressions with the policy parameters set to zero. Analysis of the impact of health reform on the labor market, however, requires the policy parameters. We will be particularly interested in the compensating differential for those who switch from not having ESHI before the reform to having it after the reform. For those individuals, shown in the expression in the last row of the each panel, if the penalty-and-subsidy-inclusive valuation is full ( $\alpha + \lambda - \mu_x = 1$ ), then the absolute value of the compensating differential is equal to the amount of the benefit (ESHI decreases wages by  $b$ ), and the hours differential is zero (ESHI does not distort hours worked).

Given the expressions in Table 1, we can use the compensating and hours differentials for those who switch to ESHI after reform to learn about the valuation of ESHI. If the compensating differential is equal to the cost of the benefit and the hours differential is zero, then we can infer that the penalty-and-subsidy-inclusive valuation is full. Previous studies based on the Summers

$$d = \frac{(w_D + b - w_A)}{(L_D - L_A)}.$$

Next, consider a point directly below  $A$  on the  $L_s^{ESHI, Before}$  curve. We can express the slope of the supply curve as follows:

$$s = \frac{(w_D - (w_A - \alpha b))}{(L_D - L_A)}.$$

We obtain the compensating and hours differentials by solving this system of equations.

model have stopped at this point because they only have enough variation to identify the valuation if it is full. If the compensating differential is less than the cost of the benefit, and the hours differential is nonzero, then they cannot infer the magnitude of the penalty-and-subsidy-inclusive valuation beyond stating that it is not full. However, as we discuss in Section 4 on identification, the additional sources of variation in our model extend the empirical content of the Summers model, allowing us to identify the penalty-and-subsidy-inclusive valuation, regardless of the true magnitude.

### 3.3 Characterization of the Welfare Impact of Health Reform

Using our model, we can also derive the impact of health reform on employer and employee welfare. To do so, we first characterize the welfare impact of health reform in terms of sufficient statistics. We then express the sufficient statistics in terms of differences between labor market equilibria, showing that our key sufficient statistics for the welfare impact of health reform are functions of compensating and hours differentials.

#### 3.3.1 Sufficient Statistics for the Welfare Impact of Health Reform

Distortions to the labor market occur when workers are willing to work for wages lower than the market wage and employers are willing to hire workers for more than the market wage, but the transaction does not occur. Summing the area of the employer and employee surplus from the transactions that would have occurred in the absence of the policy, we can express the combined deadweight loss of the policies of mandate-based health reform  $m$  as follows:

$$DWL_m = \frac{b^2}{2(s-d)} ((1 - (\alpha + \lambda - \mu_x))^2 ESHI_{After} + \rho^2 (1 - ESHI_{After})). \quad (1)$$

If we know the values for all of the terms in this equation, we can calculate the welfare impact of mandate-based health reform. Thus, these terms are sufficient statistics for the welfare-impact of mandate-based health reform. Graphically, the welfare impact corresponds to a weighted combination of the two overlapping triangles shown in Figure 1. The deadweight loss is the triangle given by  $F'AF''$  if the representative individual has ESHI after the reform, and the deadweight loss is equal to the triangle given by  $B'AB$  if he does not. As shown, the deadweight loss for individuals without ESHI is smaller, but the relative magnitudes of the triangles can reverse, depending on the magnitudes of the policy parameters. If the employer penalty is equal to zero and the full cost of ESHI and the penalty-and-subsidy-inclusive valuation is full ( $\alpha + \lambda - \mu_x = 1$ ), then there is no deadweight loss associated with health reform.

Using this expression, we can compare the deadweight loss of mandate-based reform to the deadweight loss of alternative policies. This approach can be applied to a comparison of any policy, provided we can express the key policy elements in terms of labor market equilibria. We focus on comparison of the deadweight loss from mandate-based reform to the deadweight loss from a tax-based reform that relies on a wage tax to finance a single payer or “Medicare for all” program. The

is the relevant welfare comparison if the government has already decided to expand health insurance coverage — as in the case of Massachusetts and the ACA — and is looking for the most efficient way to do so. To compare these policy options, we begin by computing the deadweight loss of a tax. Suppose that before the tax-based reform, there are no penalties or subsidies. No employers provide health insurance to their employees, such that the initial labor market equilibrium is a point  $A$ . Now suppose that the government levies a tax  $\tau$  on employers to provide health insurance (the incidence is the same if the government instead levies the tax on employees). Suppose for now that the tax is equal to the cost of providing a standard health insurance benefit  $b$ . As shown in Figure 1, labor demand shifts downward by  $b$ , and holding labor supply constant, the new labor market equilibrium is at point  $T$ . Following Summers (1989), the key assumption about tax-based reform is that it does not induce a shift in labor supply. The deadweight loss of the tax-based reform is the shaded region given by the triangle  $T'AT$ :

$$DWL_{\tau} = \frac{\tau^2}{2(s-d)}.$$

Taking the ratio of the deadweight loss of mandate-based reform to the deadweight loss of tax-based reform, allowing  $b \neq \tau$  gives:

$$\frac{DWL_m}{DWL_{\tau}} = \frac{b^2}{\tau^2} ((1 - (\alpha + \lambda - \mu_x))^2 ESHI_{After} + \rho^2 (1 - ESHI_{After})). \quad (2)$$

This equation characterizes the welfare of the combined features of mandate-based reform relative to a tax-based reform in terms of a small number of sufficient statistics: the cost  $b$  that employers pay for ESHI compared to the necessary tax revenue  $\tau$  for the same benefit; the penalty-and-subsidy-inclusive valuation,  $\alpha + \lambda - \mu_x$ , for individuals who have ESHI after reform; the employer penalty  $\rho$  for individuals who do not have ESHI after reform; and the fraction of individuals with ESHI after reform,  $ESHI_{After}$ . Since the same individuals would be covered by both mandate-based and tax-based reform, underlying health risk is invariant to the plan. Thus the ratio of  $b$  and  $t$  is just the relative loading cost of ESHI and government-provided health insurance.

Welfare in the Summers model is a special case of welfare in our model. We can capture the ratio of the full-compliance mandate in the Summers model to a tax using equation (2) with no penalties or subsidies ( $\lambda = \mu_x = 0$ ), and all agents in ESHI after reform ( $ESHI_{After} = 1$ ). We can represent the deadweight loss of the full-compliance mandate with a single triangle,  $D'AD''$ , which is smaller than the triangle associated with a tax if  $\alpha > 0$ . This special case yields the theoretical contribution of Summers (1989): an employer mandate reduces deadweight loss relative to a tax.

However, the addition of an employer mandate does not always reduce deadweight loss relative to a tax. If there is already a pay-or-play individual mandate in place, the addition of a full-compliance or a pay-or-play employer mandate weakly decreases welfare. Consider the case where there is already an individual pay-or-play mandate in place, but there is no employer penalty. The deadweight loss is given by equation (1) with  $\mu_x = \rho = 0$ . Because there is no employer penalty, there is no distortion if the individual does not have ESHI. Adding a full-compliance

mandate weakly increases the deadweight loss because the individual must have ESHI and the associated distortion; zero distortion without ESHI is no longer possible. Likewise, adding a pay-or-play mandate weakly increases the deadweight loss because the individual now has a distortion associated with a positive  $\rho$  if he does not have ESHI. Our analysis demonstrates that it is important to consider the interactions between policies when assessing welfare.

### 3.3.2 Sufficient Statistics in Terms of Labor Market Equilibria

Building on the compensating and hours differentials, we can express most of the sufficient statistics in equations (1) and (2) in terms of differences in wages and hours between the four labor market equilibria depicted in Figure 1. Our derivation follows directly from the geometry of the figure. For example, we compute the slope of the labor supply curve by comparing equilibrium  $A$  to equilibrium  $B$ , and we compute the slope of the labor demand curve by comparing equilibrium  $D$  to equilibrium  $F$ , as shown in the first two rows of Table 2. In the subsequent rows of the table, we express all other sufficient statistics in terms of the slope of the labor supply and demand curves as well as differences between the equilibria.

Table 2: Sufficient Statistics

Sufficient statistics	Wages and Hours	Coefficients
$s$	$\frac{w_B - w_A}{L_B - L_A}$	$\frac{\beta_{11}}{\gamma_{11}}$
$d$	$\frac{w_F - w_D}{L_F - L_D}$	$\frac{\beta_1 + \beta_{11} [+ \beta_{1e}]}{\gamma_1 + \gamma_{11} + [\gamma_{1e}]}$
$\rho$	$\frac{d(L_B - L_A) - (w_B - w_A)}{b}$	$\frac{d(\gamma_{11}) - (\beta_{11})}{b}$
$b$	$d(L_F - L_A) - (w_F - w_A)$	$d(\gamma_1 + \gamma_8 + \gamma_{11} + [\gamma_{1e} + \gamma_{8e}]) - (\beta_1 + \beta_8 + \beta_{11} [+ \beta_{1e} + \beta_{8e}])$
$\alpha$	$\frac{s(L_D - L_A) - (w_D - w_A)}{b}$	$\frac{s(\gamma_8 [+ \gamma_{8e}]) - (\beta_8 [+ \beta_{8e}])}{b}$
$\lambda - \mu_x$	$\frac{s(L_F - L_D) - (w_F - w_D)}{b}$	$\frac{s(\gamma_1 + \gamma_{11} [+ \gamma_{1e}]) - (\beta_1 + \beta_{11} [+ \beta_{1e}])}{b}$
$\alpha + \lambda - \mu_x$	$\frac{s(L_F - L_A) - (w_F - w_A)}{b}$	$\frac{s(\gamma_1 + \gamma_8 + \gamma_{11} [+ \gamma_{1e} + \gamma_{8e}]) - (\beta_1 + \beta_8 + \beta_{11} [+ \beta_{1e} + \beta_{8e}])}{b}$

We can characterize the entire welfare impact of health reform given by equations (1) and (2) with these sufficient statistics and two others: a value for  $ESHI_{After}$ , and a ratio of  $b$  to  $t$ . From the table, we see that two of the key sufficient statistics — the cost of the benefit  $b$  and the penalty-and-subsidy-inclusive valuation  $\alpha + \lambda - \mu_x$  — are functions of the compensating and hours differentials from before to after the reform.

## 4 Identification

In this section, we develop the empirical analog of our model. In the previous section, we have shown that we can express the compensating differential for ESHI and the welfare impact of health reform in terms of differences between the four labor market equilibria in our model. In this section,

we first discuss how we can use the Massachusetts reform to identify the differences between the equilibria empirically. We then discuss the implications for identification of the compensating differential and the welfare impact of health reform.

#### 4.1 Identifying Differences Between Labor Market Equilibria

We can use the Massachusetts reform to identify the differences between labor market equilibria. The simplest approach would require only eight data points from within Massachusetts: average wages and hours for jobs with and without ESHI before and after reform. We could use these data points to plot the four labor market equilibria depicted in Figure 1. We could then calculate the compensating differential for ESHI and the sufficient statistics for the welfare impact of health reform given in Table 2.

However, additional sources of variation are available, and incorporating them into the model can be valuable in two respects. First, we can identify the differences between labor market equilibria more convincingly, given empirical considerations that are as yet outside our model. Second, we can choose to identify more labor market equilibria. Consider the sources of variation that allow us to identify the differences between labor market equilibria more convincingly. We incorporate variation between Massachusetts and other states to control for factors that shift labor supply and demand nationally for reasons that are unrelated to Massachusetts health reform. We also incorporate variation within individuals over time to control for a myriad of worker characteristics that shift labor supply and demand for a given individual for reasons that are unrelated to Massachusetts health reform.

In addition, we incorporate variation between small and large firms to control for Massachusetts-specific factors that could shift labor supply and demand after the reform in Massachusetts, but that are unrelated to health reform. Because small firms are exempt from the employer mandate, small firms that do not provide health insurance should not shift their labor demand from before to after the reform, and equilibrium  $B$  should correspond with equilibrium  $A$ . To the extent that equilibrium  $B$  does not coincide with equilibrium  $A$  for small firms, there could be Massachusetts-specific factors that affect the labor market differentially after the reform that are not due to the reform itself. Given empirical evidence, we control for these factors in our preferred specification.

Finally, we incorporate variation in subsidy amounts to identify more labor market equilibria. This variation allows us to identify separate equilibria for individuals for different subsidy amounts. With these equilibria, we can separately identify  $\lambda$  from  $\mu_x$ , and we can identify a different value of  $\mu_x$  for each income eligibility group  $x$ . However, because using this variation requires us to divide the data into small groups based on income eligibility thresholds, we do not use this variation in our primary specification. We extend the model to incorporate variation in subsidy amounts and discuss the associated results in Online Appendix OA1.

For convenience, when we refer in our notation and discussion to a specific equilibrium, we are referring to that equilibrium after netting out differences with the control groups. For example, when we refer to the ESHI equilibrium after the reform (equilibrium F), we imply that we have

already netted out the difference between Massachusetts and other states, the difference within individuals over time, and in our preferred specification, the difference by firm size.

## 4.2 Identification of the Compensating Differential for ESHI

Recall that Table 1 expressed the compensating and hours differentials as differences between labor market equilibria. Therefore, because we can identify differences between labor market equilibria we also identify the compensating and hours differentials. However, identification of some differences between labor market equilibria comes from more plausibly exogenous variation, implying that we identify some differentials more convincingly than others.

The most convincing identification comes from changes in ESHI status for a given individual induced by the reform. Less convincing are the first two differentials in Table 1 that rely on changes in ESHI status for a given individual *within* the period either before or after reform. The changes in ESHI status that identify these compensating differentials could be endogenous if individuals gain ESHI when they get a better job that includes health insurance. Empirically, consistent with the existing literature, we do not find negative compensating differentials using variation that does not rely on the reform, even after incorporating individual fixed effects, suggesting that ESHI switches that are not due to reform could be endogenous (Gruber (2000) and Currie and Madrian (1999)). However, the reform provides a source of exogenous variation in ESHI status that we can use to identify the differentials in the last two rows of Table 1. We can identify the compensating and hours differentials between equilibrium  $D$  and equilibrium  $B$  using individuals who switch out of ESHI from before to after the reform because they become eligible for subsidies on the individual market. However, subsidies only affect individuals with certain incomes, and all other individuals will have an incentive to switch into ESHI because of the individual and employer mandates. Therefore, the last compensating and hours differentials in Table 1, which compare equilibrium  $F$  and equilibrium  $A$ , will be the best identified.

## 4.3 Identification of the Welfare Impact of Health Reform

If the differences between the labor market equilibria are identified, we can calculate the sufficient statistics using the expressions in Table 2. However, as discussed above, some differences between labor market equilibria are identified more convincingly than others. Therefore, some sufficient statistics are identified more convincingly than others. Specifically, the sufficient statistics that can be derived from a labor market equilibrium before the reform and another labor market equilibrium after the reform with a different ESHI status are the best-identified. Fortunately, these sufficient statistics are the most important for welfare analysis.

From Table 2, we see that we can identify the penalty-and-subsidy-inclusive valuation  $\alpha + \lambda - \mu_x$  and the cost of the benefit  $b$  using individuals who transition from not having ESHI before the reform to having ESHI after the reform (equilibrium  $A$  to equilibrium  $F$ ) and values for  $d$  and  $s$ . The differences between these two equilibria are our best-identified measures of the compensating and hours differentials. Therefore, the penalty-and-subsidy-inclusive valuation and the cost of the

benefit will be the best-identified sufficient statistics.

The other sufficient statistics are identified, but not as convincingly because they do not depend on changes in ESHI status induced by the reform. For example, we can identify the slope of the demand curve  $d$  by comparing individuals with ESHI before and after the reform; we can identify the slope of the supply curve  $s$  by comparing individuals without ESHI before and after the reform; and we can also identify the employer penalty  $\rho$  by comparing individuals without ESHI before and after reform, using a value for  $d$ . In practice, we estimate values for these parameters that do not accord well with values that we expect based on the literature and the empirical magnitude of the employer penalty. Given that these parameters are not convincingly identified and that their misspecification can affect the estimates of all the other sufficient statistics through the  $s$  and  $d$  terms in their derivations, we discard the empirical estimates and calibrate them. Reviewing the literature (for example Blundell and MaCurdy (1999); Hamermesh (1996)) suggests that reasonable magnitudes for labor supply and demand elasticities are 0.1 and -0.2 respectively. Because our primary specification is in levels (not logarithms) we convert these into slopes at the mean wage and hours. We also calibrate the employer penalty  $\rho$  such that the dollar value of the employer penalty  $\rho b$  is equal to the statutory penalty of \$295 per year.

Given that we calibrate some sufficient statistics, one might be tempted to calibrate most of our model using the statutory values of the policy parameters, rather than estimating any sufficient statistics. However, we prefer to estimate the sufficient statistics for several reasons. First, the individual's underlying valuation  $\alpha$  does not have a statutory value. Second, the behavioral response to the policy parameters might be smaller or larger than the statutory policy parameters because of interactions between them and the individual's underlying valuation (see footnote 9). Third, to the extent that we think the behavioral response to the policy parameter should be equal to the statutory value, we can compare the two values in an over identification test.

Because of difficulties with separate identification, we rely mostly on the parameters or sums of parameters that are best-identified:  $b$  and  $\alpha + \lambda - \mu_x$ . As shown, we can characterize the entire welfare impact of health reform given by equations (1) and (2) with these sufficient statistics and two others: a value for  $ESHI_{After}$ , which we estimate, and a ratio of  $b$  to  $t$ , which we can calibrate. However, separate estimates of  $\alpha$ ,  $\lambda$ , and  $\mu_x$  would allow us to analyze the welfare impact of the separate components of health reform independently, so we proceed in estimating them, keeping in mind that our identification poses challenges.

As shown in Table 2, identification of  $\alpha$  requires a value for  $s$  and the comparison of people with and without ESHI before reform. The inclusion of individual fixed effects should help to identify  $\alpha$  because we control for time-invariant factors that affect wages and benefits. However, any changes over time that affect both simultaneously will lead to bias. For example, if an individual without health insurance gets promoted to a job with higher wages and ESHI, we will estimate a negative value for  $\alpha$ , even if the individual values the benefit such that the true value of  $\alpha$  is positive. Such bias is precisely the problem that has hindered previous effort to identify compensating differentials, particularly the compensating differential for entire cost of ESHI. Our identification for the penalty-and-subsidy-inclusive valuation is compelling relative to our identification of  $\alpha$ , illustrating the

advantage of our approach over the existing literature.

We are similarly interested in separate estimates for  $\lambda$  and  $\mu_x$ . As shown in Table 2, identification of the difference  $\lambda - \mu_x$  requires a value for  $s$  and the comparison of people with ESHI before and after reform. To separately identify  $\mu_x$  from  $\lambda$ , and to identify different values of  $\mu_x$  for people eligible for different subsidy amounts, we can incorporate variation in subsidy amounts across income eligibility thresholds as we discuss in Online Appendix OA1.

## 5 Estimation

To estimate all of the relevant differences between labor market equilibria and sufficient statistics that we use to estimate the compensating and hours differentials and the welfare impact of health reform, we specify and estimate wage and hours equations of the following form:

$$\begin{aligned}
 Y_{it} = & [\beta_1 MA * ESHI * After * Large + \beta_8 MA * ESHI * Large + \beta_{11} MA * After * Large + \\
 & \beta_{12} ESHI * After * Large + \beta_{19} ESHI * Large + \beta_{22} After * Large + \\
 & \beta_{23} Large + \phi_g * Large + ] \\
 & \beta_{1[e]} MA * ESHI * After + \beta_{8[e]} MA * ESHI + \beta_{11[e]} MA * After + \\
 & \beta_{12[e]} ESHI * After + \beta_{19[e]} ESHI + \beta_{22[e]} After + \phi_s + \delta_i + \varepsilon_{it}, \tag{3}
 \end{aligned}$$

where  $Y_{it}$  measures wages  $w$  or hours  $L$  for individual  $i$  at time  $t$ . In our main specifications, we specify wages and hours in levels. The level specification allows us to capture the impact of the reform on the intensive margin of how many hours to work and the extensive margin of whether to work because we can include unemployed workers in the sample, specifying that they have wages and hours of zero. We also investigate robustness to specifying wages and hours in logarithmic form.  $MA$  is an indicator for the state of Massachusetts relative to other states,  $ESHI$  is an indicator for ESHI relative to the absence of ESHI,  $After$  is an indicator for the period after the reform relative to the period before the reform, and  $Large$  is an indicator for large firms or firms of unknown size relative to small firms that are exempt from the employer mandate. We begin with a baseline specification that excludes all bracketed terms, which reflect variation between large and small (exempt) firms with  $e$  coefficient subscripts. We include the bracketed terms in our preferred specification. We represent the coefficients of the wage equation with subscripted  $\beta$  coefficients, and we represent the corresponding coefficients of the hours equation with subscripted  $\gamma$  coefficients. The numbers of the coefficients convey that they are a subset of the coefficients of the full equation that we use to separately identify different values of  $\mu_x$ , which we present in Online Appendix OA1. We include state fixed effects  $\phi_s$ , with a state other than Massachusetts omitted, to control for differences in wages across states, and we include individual fixed effects  $\delta_i$ , to control for time-invariant differences across individuals, allowing for individual-specific shocks at time  $t$ ,  $\varepsilon_{it}$ . We include a time fixed effect  $After$  to control for changes in the labor market over time, and we convert all wages into 2006 dollars using the Consumer Price Index for all urban consumers

(CPI-U) to adjust for inflation. We do not include time fixed effects at a greater level of detail in our main specification because the calculation of our sufficient statistics requires a single period before reform and a single period after reform. In all specifications, we also allow for a “during” implementation period that is separate from the before and after periods.<sup>11</sup>

Our estimating equations are so simple that we can estimate them with ordinary least squares. The simplicity of the estimating equations is an advantage of our model relative to alternative structural models because robustness analysis is easier to implement, and the results are more transparent. Furthermore, because the functional form of these equations is relatively simple, we can interpret the coefficients directly as well as the combinations of coefficients that make up the sufficient statistics.

Although our estimating equations resemble differences-in-differences models, such models are typically used to identify a single coefficient after netting out differences with control groups. In our case, however, we are interested in identifying the four labor market equilibria of our model, from which we derive the compensating and hours differentials and the sufficient statistics for welfare analysis. To obtain the four labor market equilibria of our model, we combine several coefficients from the wage and hours equations, making our analysis richer than traditional difference-in-differences analysis.

### 5.1 Estimating the Compensating Differential for ESHI

The first step in estimating the compensating differential for ESHI is to express the four labor market equilibria of our model in terms of coefficients from the estimating equations. We express the wages associated with each equilibrium in Table 3. We can express the hours associated with each equilibrium with  $\gamma$  in place of  $\beta$ . We normalize  $w_A = 0$  and  $L_A = 0$  so that all equilibria are relative to the equilibrium without ESHI before reform. The derivation of these expressions is straightforward. For example, the difference in wages between equilibrium  $B$  and  $A$  (the equilibrium without ESHI after the reform relative to the equilibrium without ESHI before the reform) is  $\beta_{11}$ , the change in wages from after the reform to before the reform for individuals who remain without ESHI in Massachusetts, relative to individuals in other states who remain without ESHI over the reform period. In the preferred specification, which includes the bracketed terms in equation (3),  $\beta_{11}$  also reflects the difference between individuals in large firms and individuals in small exempt firms, thus controlling for Massachusetts-specific factors after reform.

Table 3: Wages in Terms of Coefficients

$w_A$	NoESHI, Before	0
$w_B$	NoESHI, After	$\beta_{11}$
$w_D$	ESHI, Before	$\beta_8 [ + \beta_{8e} ]$
$w_F$	ESHI, After	$\beta_1 + \beta_8 + \beta_{11} [ + \beta_{1e} + \beta_{8e} ]$

<sup>11</sup>To simplify exposition, we omit the terms that correspond to the during period from equation (3). In all of our models, we include a term for the during period that corresponds to each term for the after period. We represent the coefficients on during period terms with corresponding  $d$  superscripts.

The next step in estimation of the compensating differential for ESHI is to express the compensating differentials in terms of coefficients. The last column of Table 1 expresses the compensating and hours differentials in terms of coefficients, which we can replace with estimated coefficients.

Our preferred measure of the compensating differential,  $w_F - w_A$ , is the sum of several coefficients:  $\beta_1 + \beta_8 + \beta_{11}$  [ $+\beta_{1e} + \beta_{8e}$ ]. These coefficients reflect the change in wages observed for individuals who switch from not having ESHI before the reform to having it after the reform, relative to individuals who have the same switch in ESHI status from before to after reform in other states. The coefficients in the preferred specification also control for Massachusetts-specific wage changes after reform using variation by firm size.

If there were no employer penalty ( $\rho = 0$ ), we could simplify our preferred estimate of the compensating differential to  $\beta_1$  [ $+\beta_{1e}$ ]. The employer penalty reduces potential sources of identification for the compensating differential because it affects the labor market equilibrium for workers *without* ESHI after the reform in Massachusetts. If the only impact of the reform were to change the labor market equilibrium for workers with ESHI after the reform, which would be the case if there were no employer penalty, workers without ESHI after the reform could provide an additional control group for workers with ESHI after the reform. Thus, we could control for Massachusetts-specific shocks unrelated to health reform in Massachusetts that occur at the same time as the reform without having to incorporate variation in firm size. In that case, the specification without firm size interactions would simplify into a traditional difference-in-differences-in-differences specification in which  $\beta_1$  would reflect the compensating differential for ESHI. Instead of being part of the estimated compensating differential, the coefficient  $\beta_{11}$  would control for Massachusetts-specific shocks coincident with reform, and the coefficient  $\beta_8$  would control for time-invariant differences between individuals with ESHI and individuals without ESHI in Massachusetts relative to other states. The disadvantage of having an employer penalty of zero in terms of identification would be that we would no longer have any labor supply shifters, so we could not identify the slope of the labor supply curve  $s$ .

Because the Massachusetts reform included a positive statutory employer penalty, even though it was small relative to the cost of ESHI, we prefer the expression  $\beta_1 + \beta_8 + \beta_{11}$  [ $+\beta_{1e} + \beta_{8e}$ ] for the compensating differential. However, because the statutory employer penalty was small, the compensating differential could, in practice, be very similar to  $\beta_1$  [ $+\beta_{1e}$ ]. In the model without firm size interactions, as the employer penalty goes to zero,  $\beta_8$  and  $\beta_{11}$  should approach zero and  $\beta_1$  should approach the magnitude of the compensating differential. Thus, when we examine the coefficients of our model, we expect  $\beta_1$  to be large and negative, and we expect  $\beta_8$  and  $\beta_{11}$  to be close to zero. Further, we expect  $\beta_8$  to be negative because as we have shown in Table 3,  $\beta_8$  gives the position of equilibrium  $D$ , which according to our model, should be to the lower left of equilibrium  $A$ . We also expect  $\beta_{11}$  to be negative because we have shown that  $\beta_{11}$  gives the position of equilibrium  $B$ , which should also be to the lower left of equilibrium  $A$  if there is a positive penalty. If our estimated  $\beta_8$  is positive, we will not trust our identification of the compensating differential identified by  $w_D - w_A$ , and we will continue to prefer the expression for  $w_F - w_A$ . If our estimated  $\beta_{11}$  is positive, we will want to incorporate the firm size interactions

that control for Massachusetts-specific labor market changes coincident with reform.

## 5.2 Estimating the Welfare Impact of Health Reform

To estimate the welfare impact of health reform, the first step is to express the sufficient statistics in terms of coefficients. We have already expressed the sufficient statistics in terms of differences between labor market equilibria in the second column of Table 2 and the labor market equilibria in terms of coefficients in Table 3. Combining, we express the sufficient statistics in terms of coefficients in the third column of Table 2.

Next, we estimate the deadweight loss of mandate-based reform by replacing terms with their corresponding empirical estimates as follows:

$$DWL_m = \frac{\widehat{b}^2}{2(\widehat{s} - \widehat{d})} \left( (1 - (\alpha + \widehat{\lambda} - \mu_x))^2 E\widehat{SHI}_{After} + \widehat{\rho}^2 (1 - E\widehat{SHI}_{After}) \right). \quad (4)$$

We also estimate the ratio of the deadweight loss of mandate-based reform to the deadweight loss of tax-based reform as follows:

$$\frac{DWL_m}{DWL_\tau} = \left( \frac{\widehat{b}}{\tau} \right)^2 \left( (1 - (\alpha + \widehat{\lambda} - \mu_x))^2 E\widehat{SHI}_{After} + \widehat{\rho}^2 (1 - E\widehat{SHI}_{After}) \right), \quad (5)$$

where we use  $\widehat{\cdot}$  to denote the estimate that corresponds to each parameter. We obtain  $\alpha + \widehat{\lambda} - \mu_x$  and  $\widehat{b}$  by plugging the estimated values of the compensating and hours differentials and the calibrated values of  $\widehat{s}$  and  $\widehat{d}$  into Table 2. We calibrate  $\widehat{\rho}$  to reflect the statutory employer penalty in Massachusetts. For  $\widehat{b}/\tau$ , we assume that  $b = \tau$ . We later relax this assumption and assess robustness to assuming lower loading costs for health insurance provided through tax-based reform. The only remaining parameter is  $E\widehat{SHI}_{After}$ , which we estimate as the probability of having ESHI in Massachusetts after reform in our data.

## 6 Data, Summary Statistics, and Examination of Labor Market Trends before Reform

### 6.1 The Survey of Income and Program Participation

For our main analysis, we use the Survey of Income and Program Participation (SIPP), a nationally representative longitudinal survey covering households in the civilian non-institutionalized population.<sup>12</sup> Individuals selected into the SIPP sample are interviewed once every four months over a four-year panel, with each interview covering information about the previous four-month period,

<sup>12</sup>The SIPP is not designed to be representative within the state of Massachusetts; however, the SIPP is the best data available to us on other dimensions, so we proceed by focusing on within-individual variation. We have also run our main regressions in the restricted-access Medical Expenditure Panel Survey (MEPS) with state identifiers, but the MEPS is only approximately 15% of the size of the SIPP, with 160 individuals in Massachusetts, so sample size is not large enough for us to obtain reliable results.

resulting in person-month-level data. Interview months differ across individuals in the sample. Previous research has shown evidence of “seam bias” in the SIPP, whereby individuals tend to give the same responses during one interview for all four months associated with the interview period, but they do change responses from one interview to the next (see Chetty (2008)). To address seam bias, we restrict our data to the interview month in our regression specifications. We use weights in all summary statistics and regressions to account for SIPP’s sampling and response unit design.<sup>13</sup>

We use the full 2004 SIPP panel, which covers October 2003 to December 2007. The main limitation of this SIPP panel is that it does not extend for a long time after reform was fully implemented. Although we observe a relatively short period of responses after all of the aspects of the reform were in effect on July 1, 2007, we also observe a full year of responses during the implementation of the reform. Following our previous work, we refer to the period from July 2006 through June 2007 as the *During* period and the period from July 2007 forward as the *After* period. By doing so, we attain different estimates during the period in which it was initially rolled out and after the period in which it was fully implemented. Furthermore, open-enrollment periods for ESHI are generally in November, with new coverage starting in January. Thus, to satisfy the individual mandate in July 2007 by taking up ESHI, many individuals would have to start coverage in January 2007, well before our data ends at the end of December 2007.

Another limitation of the 2004 SIPP panel is that the sample size decreases over time, due primarily to interview reductions. Our group of interest is the population under age 65, without military health insurance or Medicare. In 2004, there are 91,771 unique individuals (716,606 observations) in this sample across states, of which 2,690 unique individuals (20,457 observations) are in Massachusetts. In 2007, there are 35,733 unique individuals (320,775 observations) in the sample, of which 847 unique individuals (7,513 observations) are in Massachusetts. However, we still have a large enough sample to find statistically significant results in our main specifications.

The SIPP allows us to construct our main dependent variables: hourly wages  $w$  and hours worked per week  $L$ . The SIPP allows respondents to report wages and hours for up to two jobs. Our main estimates rely on income and hours worked only in the primary job. Because the SIPP data only include monthly income, not monthly wages, we must divide income by a measure of hours worked to obtain monthly wages. However, because our model relies on separate movements in  $w$  and  $L$ , it would be problematic for both measures to reflect contemporaneous movements in

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<sup>13</sup>Our main analysis uses data from the core content of the SIPP. We construct our data by appending the 12 individual-wave files from the 2004 panel and merging longitudinal weights onto the full file by individual person identifiers. Longitudinal panel weights account for people who were in the sample in wave 1 of the panel and for whom data were obtained (either reported or imputed) for every month of the panel. There are four panel weights associated with the 2004 SIPP panel; the first covers people present in waves 1-4, the second covers people in waves 1-7, the third covers people in waves 1-10, and the fourth covers people who have data for the whole sample (waves 1-12). The panel weighting scheme does not assign weights to people who enter the sample universe after wave 1 (panel weight=0 if the individual was not in the sample in wave 1, if they have missing data for one or more month(s), or both). In choosing the appropriate weights, there is a tradeoff between length of individual data and reductions in sample size associated with attrition. Our preferred specification does not use panel weights and instead uses individual weights, therefore maximizing the number of respondents. In results not reported, we re-estimate our main regressions using each panel weight. Reassuringly, the main coefficients of interest are relatively robust to these weight changes. Using weights 3 or 4 does lead to substantial loss of precision as the sample size falls when moving from longitudinal weight 1 to 4.

*L.* To get around this issue, which is related to the common division bias problem from the labor economics literature, we divide income by the average hours reported in the first four interviews (representing a 16-month period). Our regression estimates are robust to the alternative wage measures, likely because hours move infrequently.

## 6.2 Summary Statistics

Before proceeding to our regression results, we assess the empirical validity of comparing Massachusetts to other states by comparing labor market, health insurance, and demographic variables. We also compare labor market trends in Massachusetts and other states based on ESHI status, as required by our model. Our identification will be most convincing if labor market trends are similar in Massachusetts and other states before reform.

Our identification can also be convincing if we observe similar aggregate labor market trends in Massachusetts and other states *after* the reform. From prior research, we know that, while the reform resulted in a significant decline in the percentage of people without health insurance, only approximately 6 percentage points of the population gained health insurance coverage. Of those who gained coverage, roughly half gained ESHI and the other half gained subsidized coverage (Kolstad and Kowalski (2010)). While we do expect potentially large labor market impacts for individuals who switched ESHI status as a result of reform, even very large impacts for these individuals should only result in small changes in the aggregate labor market. To the extent that we do see changes in the aggregate labor market, they could reflect impacts of reform, or they could reflect factors unrelated to reform that differentially affected Massachusetts relative to other states after reform. If we are worried about the latter, we can incorporate variation by firm size.

We report summary statistics in Table 4. We compare the full population, the Massachusetts population, and the non-Massachusetts population before reform (October 2003 to June 2006) and after reform (July 2007 to December 2007). We exclude the during reform period for simplicity. In this table, we include all months, not just interview months. The sample size in each row is different, depending on data availability. In this table and throughout the paper, we deflate wages by the 2006 CPI.

The first row of the table shows our primary measure of  $w$ : weekly earnings divided by baseline hours per week, including zero wages for individuals without a paid job. Wages are higher in Massachusetts than they are in other states before and after reform. Netting out the change in wages in other states from before to after reform, as shown in the last column, hourly wages increased by \$1.83 in Massachusetts after reform on a base of \$17.86 before reform. This increase is significant at the 99% level. Excluding individuals without a paid job in the second and third rows of the table, we see that wages increased by \$0.30, 1.7% among the employed, which is less than the wage increase that we see in the full sample, suggesting that part of the wage increase we observe is driven by an increase in the number of people with paid jobs. Indeed, the probability of reporting a paid job increased by 4.5 percentage points in Massachusetts after reform on a base of 80% before reform.

Table 4: Summary Statistics

	Full Population		MA		Non-MA		MA-Non-MA
	Before	After	Before	After	Before	After	After-Before
w: Weekly earnings / baseline hours per week	13.87	14.60	17.86	20.39	13.78	14.47	1.829***
w paid job & w>0	20.59	22.37	25.11	27.17	20.49	22.25	0.301
Log(w paid job & w>0)	2.76	2.84	2.95	3.05	2.75	2.84	0.017**
L: Hours per week	28.01	27.68	29.03	30.45	27.98	27.62	1.775***
L paid job & L>0	38.65	38.47	37.8	37.42	38.67	38.5	-0.202**
Log(L paid job & L>0)	3.59	3.59	3.55	3.55	3.59	3.59	-0.002
Hours per week in all jobs	40.82	0.74	40.15	39.06	40.84	40.58	-0.834***
Paid job	0.76	0.76	0.80	0.83	0.76	0.76	0.041***
Employed by Large Firm paid job	0.88	0.87	0.88	0.85	0.88	0.87	-0.019***
Any Health Insurance	0.85	0.86	0.92	0.96	0.85	0.86	0.035***
ESHI	0.70	0.70	0.78	0.79	0.70	0.70	0.020***
<150%FPL†	0.12	0.10	0.08	0.06	0.12	0.10	0.007*
150-300%FPL†	0.20	0.16	0.15	0.09	0.20	0.16	-0.022***
Age	33.28	33.54	33.22	33.15	33.29	33.55	-0.336***
Married	0.44	0.44	0.43	0.39	0.44	0.44	-0.031***
Female	0.51	0.51	0.51	0.50	0.51	0.51	-0.010***

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, block bootstrapped by state.

†FPL category defined for each individual based on status in the Jan-June 2006 period.

2004 SIPP Panel. Monthly weights used.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.

Before: October 2003 - June 2006; After: July 2007 - December 2007. Statistics are averages over the relevant period.

MA-Non-MA *After-Before* is the coefficient on MA\*After from a regression of the outcome on MA\*After, MA, and After.

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, block bootstrapped by state.

w and L measures include individuals without a paid job with w=0 or L=0, respectively, unless noted otherwise.

Results in the fourth row suggest that hours increased by 1.8 hours per week in our preferred measure of  $L$ , which includes zero hours for individuals without a paid job. However, the increase in hours appears to entirely reflect an increase in employment. Among individuals with a paid job, hours decreased by 0.20 hours per week on a base of 37.8 hours per week before reform, or by 0.2% in the logarithmic specification. The next row shows that by focusing on the first job only in our primary measure of  $L$ , we account for approximately 95% of hours in all jobs.

Taken together, these results suggest that Massachusetts experienced increased wages and increased hours overall, with some of the increase in wages and all of the increase in hours operating through increased employment. The increases in wages and hours that we observe are not consistent with the theoretical impact of an increase in ESHI for those who gained coverage, suggesting that mandate-based reform in Massachusetts had little if any impact on the aggregate labor market. To understand what is driving the labor market changes that we observe, we first examine the differences-in-differences impact on health insurance coverage in our sample, and then we examine wage trends at high frequency in Massachusetts and other states by ESHI status.

In the middle rows of Table 4, we compare insurance coverage in Massachusetts and other states. Massachusetts has higher insurance coverage rates than other states; approximately 92% of individuals under the age of 65 without Medicare or military health insurance in Massachusetts had some type of health insurance before reform, increasing to 96% after reform. Outside of Massachusetts, health insurance coverage increased slightly from 85% to 86% over the same period. The simple differences-in-differences estimate for the increase in coverage in Massachusetts due to

the reform is 3.5 percentage points; slightly lower but consistent with existing estimates (Long (2008); Kolstad and Kowalski (2010); Yelowitz and Cannon (2010)). ESHI coverage rose from 78% to 79% in Massachusetts from pre-reform to post-reform; coverage was steady at approximately 70% in non-Massachusetts states.

The final rows of Table 4 compare demographic characteristics in Massachusetts and other states. We see that roughly the same percent of individuals with paid jobs work for large firms in Massachusetts and other states (88% before reform). Massachusetts residents have higher incomes, so smaller numbers of individuals in Massachusetts qualify for Medicaid and CommCare under the Massachusetts reform thresholds. Other demographic characteristics reported look similar. We will control for time-invariant demographic characteristics in our regressions using individual fixed effects.

### 6.3 Wage Trends by ESHI Status

Figures 2 and 3 show wage trends over time by ESHI status in Massachusetts and other states, using the level of wages and the logarithm of wages, respectively. In these figures, as in the previous table, we use data from all months, not just interview months.

These figures give us several insights into the empirical relationship between ESHI and labor market outcomes in Massachusetts and other states. First, inside and outside of Massachusetts, wages are higher for jobs with ESHI than for jobs without ESHI, consistent with the literature that finds no compensating differential for ESHI. Second, within jobs with the same ESHI status, wages were higher in Massachusetts than other states before reform, but they were trending similarly. Massachusetts trends are noisier because they are based on a smaller sample of respondents. The trends are noisiest at the end of the sample period, when the sample size decreases. Third, after the reform, there is a barely visible increase in the slope of the Massachusetts trend lines relative to the trend lines outside of Massachusetts, which was reflected in our previous difference-in-differences estimates. Because of this issue, we incorporate variation by firm size in our preferred specifications.

Before incorporating variation by firm size, we explore the impact of incorporating longitudinal variation on wage trends by ESHI status for Massachusetts compared with other states. Because incorporating longitudinal variation places greater demands on the data, making the trend lines noisier, we combine each monthly response into mutually exclusive two-month periods. We run a regression analogous to our baseline (no bracketed terms) specification given by equation (3), where the only change is that we replace every instance of *After* with a vector of all two-month periods in our data, omitting only the last two-month period before reform (May-June 2006).

In Figure 4, we plot the vector of coefficients corresponding to  $\beta_{12}$  with the points connected by the dashed line labeled *ESHI*. This line gives the wage premium for jobs with ESHI relative to jobs without ESHI outside of Massachusetts. We define the wage premium as the empirical difference in wages between jobs with ESHI and jobs without ESHI; this might not be equal to the compensating differential in our model in the absence of adequate identification. We also plot the vector of coefficients corresponding to  $\beta_1$  with the points connected by the solid line labeled

Figure 2: Wage Trends, MA vs. Non-MA

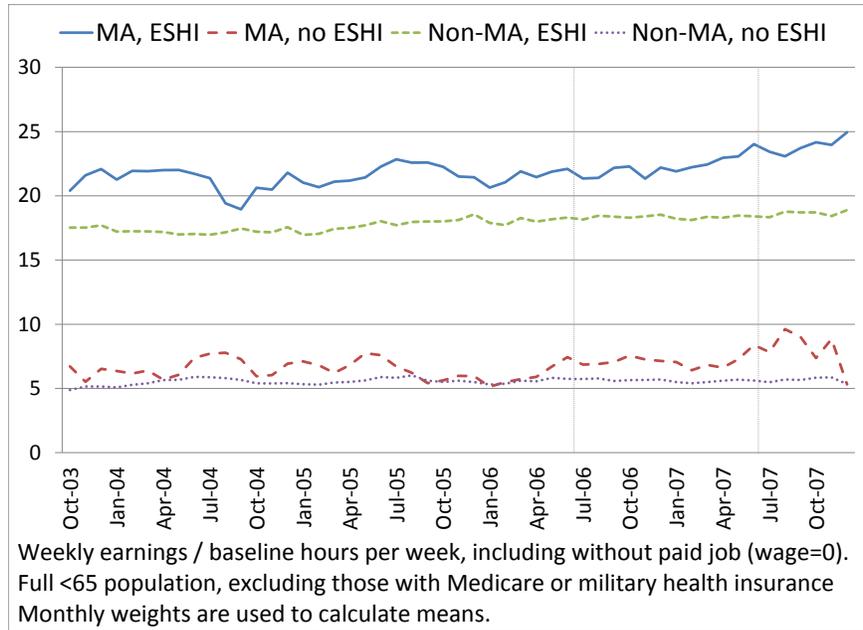


Figure 3: Log Wage Trends, MA vs. Non-MA

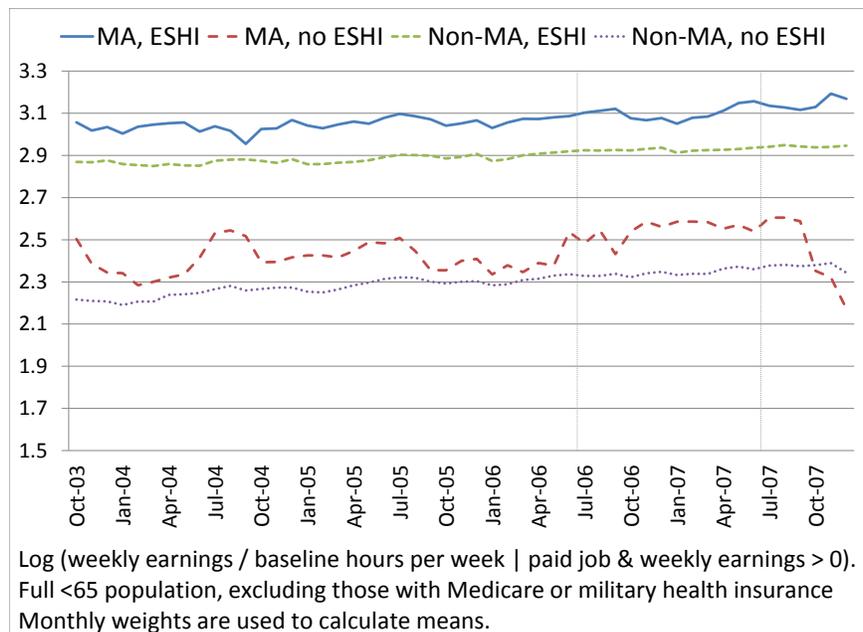


Figure 4: Longitudinal Wage Premium for Jobs with ESHI Relative to Jobs Without ESHI, MA vs. Non-MA

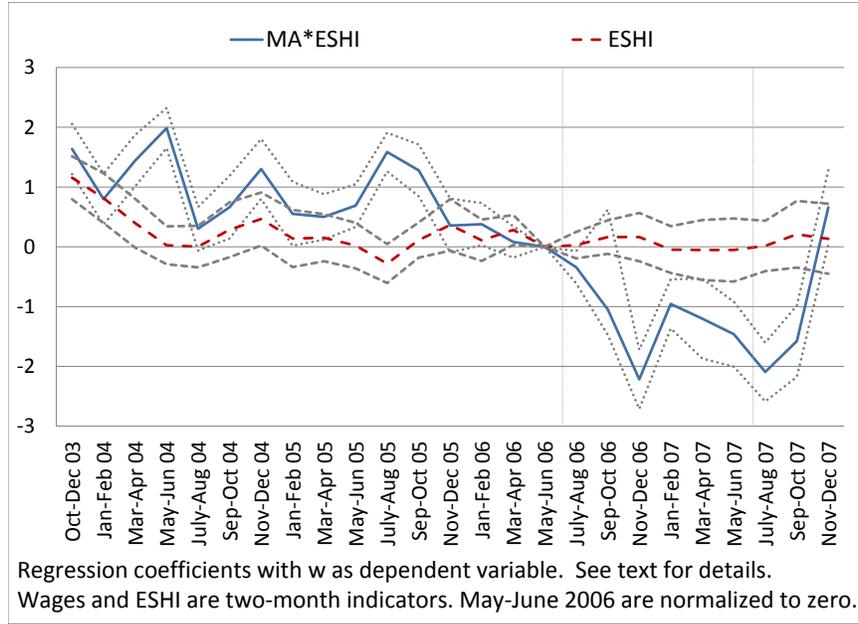
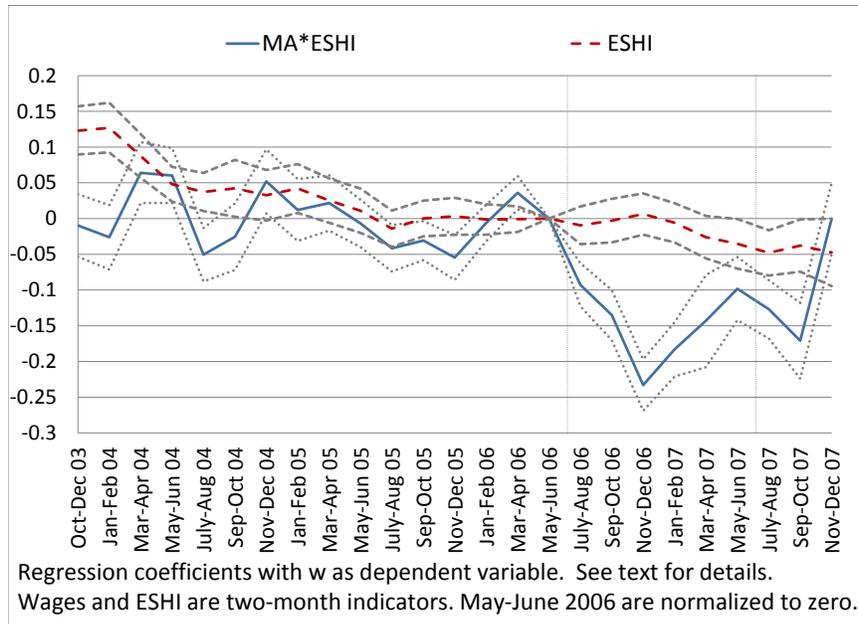


Figure 5: Longitudinal Log Wage Premium for Jobs with ESHI Relative to Jobs Without ESHI, MA vs. Non-MA



$MA * ESHI$ . This line gives the differential wage premium for ESHI jobs relative to jobs without ESHI in Massachusetts, relative to other states. We also show 95% confidence intervals for both lines, block clustered by state. In Figure 5, we plot the corresponding coefficients from a regression with the logarithm of wages as the dependent variable, estimated only on individuals with a paid job. Because individual fixed effects are included in the regressions, the coefficients corresponding to  $\beta_{12}$  are identified by people outside of Massachusetts who change ESHI status in the given period relative to the omitted period. The coefficients corresponding to  $\beta_1$  are identified by people within Massachusetts who change ESHI status in the given period relative to the omitted period or by people who move between Massachusetts and other states in the given period relative to the omitted period.

In the omitted period, the wage premium for jobs with ESHI relative to jobs without ESHI is normalized to zero. Outside of Massachusetts, we see that the wage premium for ESHI jobs increases over time in Figure 4. However, when we examine the log wage premium in Figure 5, we see a downward trend, suggesting that wages increase faster in jobs without ESHI, reflecting the secular increase in the cost of health insurance relative to inflation over this time period.

Within Massachusetts, as shown in Figure 4, the premium for ESHI jobs relative to jobs without ESHI is higher before the reform relative to other states. However, it trends similarly for individuals with paid jobs before reform, as shown in Figure 4. The similar trends in Massachusetts and other states before reform lend support to our identification strategy.

Following the passage of reform in Massachusetts, we see a striking shift in the relationship between ESHI and wages for individuals who switch ESHI status. There is a substantial drop in the wage premium for ESHI jobs relative to jobs without ESHI during and after the reform in Massachusetts relative to the period before the reform and relative to other states. This is true for all of the two-month periods after May-June of 2006 except for for the last two-month period, which shows a puzzling increase in both figures. The increase seems to be due to sizeable attrition from the sample in the last two months and not to a real increase in the wage premium. If we examine the underlying data more closely, we see that there are approximately 4,000 observations (with multiple observations for approximately 2,000 unique individuals) in Massachusetts in each two-month period before reform, and approximately 1,500 observations (about 725 unique individuals) in Massachusetts in each two-month period after reform, with the exception of the last two-month period, Nov to Dec 2007, in which there are only 511 observations (350 unique individuals). Our baseline regression, which pools all data within the before, during, and after periods separately, places little weight on the visible uptick in the very last two-month period because of the small sample size from which it is drawn.

Although the regression results formalize the magnitude of the decline in the wage premium after reform, we can learn something about the magnitude by examining Figures 4 and 5, keeping in mind that the last point gets the smallest weight. We should also keep in mind that we expect wages for jobs with and without ESHI to fall in Massachusetts after reform, and by analyzing coefficients that correspond to  $\beta_1$  only, we are assuming that there is no employer penalty. The true compensating differential that takes the employer penalty into account will be larger than

the effects we observe. In Figure 4, the magnitude of the decline in the wage premium for ESHI jobs in Massachusetts over the entire period during and after reform appears to be approximately \$2/hour, which corresponds to a roughly 10% decline in Figure 5. These figures provide the first evidence that the Massachusetts reform affected jobs with ESHI, as we predict in our model. They also signal that this can be an exogenous sources of variation that will be useful in identifying a compensating differential for ESHI.

## 7 Results and Discussion

We report results from the baseline wage and hours equations in Table 5, and we begin our analysis by examining the coefficients directly. Recall that  $\beta_1$  gives the compensating differential and  $\gamma_1$  gives the hours differential if we assume that there is no employer penalty and, therefore, individuals without ESHI in Massachusetts after reform provide an additional control group for individuals with ESHI in Massachusetts after reform. The estimated  $\beta_1$  tells us that hourly wages are \$2.61 lower for individuals with ESHI relative to individuals without ESHI, after the reform relative to before the reform, in Massachusetts relative to other states. This coefficient is statistically significant at the 99% level. Annualizing the decrease in hourly wages for a full-time worker, this coefficient implies that the compensating differential for ESHI is  $-5,426.72 (= -2.609 * 40 * 52)$  dollars per year. This compensating differential is of the expected sign, standing in contrast to much of the literature.

To get a sense of what we expect the magnitude of the compensating differential for ESHI to be, recall that the absolute value of the compensating differential will be equal to the cost of ESHI to employers  $b$  if the employer penalty  $\rho$  is equal to zero and the penalty-and-subsidy-inclusive valuation  $\alpha + \lambda - \mu_x$  is full. Before estimating  $b$  using our model, we calculate a comparison estimate from the Kaiser Family Foundation 2007 Survey of Employer Health Benefits (Kaiser Family Foundation (2007b)). The average 2007 premium was \$4,355 for an individual plan and \$11,770 for a family plan (all amounts converted to 2006 dollars). The average employer contribution was 85% for an individual and 73% for a family plan. We weight our estimate of the annualized  $b$  to reflect the likely share of individual vs. family plans in the SIPP population. Using the share of the SIPP population with ESHI after reform who report having at least one child to calculate the share of family plans, the average annualized  $b$  was \$6,105. Alternatively, using the same family definition and the share of the same SIPP population who switched from not having ESHI in 2006 to having it after reform, the average annualized  $b$  was \$5,576. In this context, the magnitude of the compensating differential we estimate based on  $\beta_1$  seems reasonable, especially considering that the assumption that the employer penalty is zero should bias our estimate toward zero, suggesting that our preferred estimate will be larger and even more in line with actual costs of ESHI to employers.

If we do not assume that the employer penalty is zero, our preferred estimate of the compensating differential from the baseline model is  $\beta_1 + \beta_8 + \beta_{11} = -2.609 + 2.054 + 3.215 = 2.660$ , which is of the wrong theoretical sign. Recall from Section 5.1 that if the employer penalty is small and there are no labor market changes in Massachusetts relative to other states after reform, we expect  $\beta_{11}$  to be small relative to  $\beta_1$  and negative. Similarly, if our individual fixed effects allow us to

Table 5: Results from Baseline Specification

		(1)		(2)
		w		L
		Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)		Hours per week, including individuals without a paid job (hours=0)
MA*ESHI*After	$\beta_1$	-2.609*** [-3.068, -2.057]	$\gamma_1$	-1.183*** [-1.824, -0.568]
MA*ESHI*During	$\beta_1^d$	-2.241*** [-2.540, -1.725]	$\gamma_1^d$	-2.377*** [-2.762, -1.872]
MA*ESHI	$\beta_8$	2.054*** [1.656, 2.412]	$\gamma_8$	1.409*** [0.609, 1.729]
MA*After	$\beta_{11}$	3.215*** [2.774, 3.480]	$\gamma_{11}$	2.308*** [1.764, 2.787]
MA*During	$\beta_{11}^d$	2.393*** [1.972, 2.619]	$\gamma_{11}^d$	3.010*** [2.566, 3.301]
ESHI*After	$\beta_{12}$	-0.122 [-0.614, 0.397]	$\gamma_{12}$	-0.982*** [-1.343, -0.402]
ESHI*During	$\beta_{12}^d$	-0.178 [-0.565, 0.114]	$\gamma_{12}^d$	-0.775*** [-0.993, -0.459]
ESHI	$\beta_{19}$	3.847*** [3.392, 4.099]	$\gamma_{19}$	6.495*** [6.091, 6.730]
After	$\beta_{22}$	0.536*** [0.198, 0.831]	$\gamma_{22}$	1.243*** [0.697, 1.662]
During	$\beta_{22}^d$	0.413*** [0.174, 0.711]	$\gamma_{22}^d$	0.966*** [0.621, 1.219]
Observations		495,420		479,374
R-squared		0.758		0.832

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries.

Only includes interview months.

Individual and state fixed effects included. Monthly weights used.

identify the compensating differential convincingly without using variation in ESHI induced by reform, we expect  $\beta_8$  to be small and negative relative to  $\beta_1$ . However, both are positive and of the same order of magnitude as  $\beta_1$ . Our estimated  $\beta_{11}$  suggests that something other than reform differentially affected the labor market in Massachusetts relative to other states (confirming our discussion of summary statistics), so we prefer the specification that incorporates variation by firm size. Our estimated  $\beta_8$  suggests that we need variation in ESHI induced by reform to estimate the compensating differential for ESHI (our estimated compensating differential is \$3.22 in Massachusetts before reform, netting out differences with other states), so we focus on our preferred estimate that compares equilibrium  $A$  to equilibrium  $F$  within our preferred specification.

In the second column of Table 5, our estimate of the hours differential using  $\gamma_1$  tells us that weekly hours are -1.183 lower for jobs with ESHI relative to jobs without ESHI in Massachusetts relative to other states, after reform relative to before reform. Recall that if the penalty-and-subsidy-inclusive valuation of the benefit is full, the hours differential will be zero. This estimate is statistically different from zero at the 99% level, suggesting that the penalty-and-subsidy-inclusive valuation will be less than full, and we need to turn to our model to calculate it. Analysis of the  $\gamma_8$  and  $\gamma_{11}$  coefficients parallels analysis of the  $\beta_8$  and  $\beta_{11}$  coefficients, suggesting that the specification with firm size interactions will be our preferred specification.

## 7.1 Estimates of the Compensating Differential for ESHI

To obtain our preferred estimates of the compensating differential and hours differential for ESHI, we estimate our preferred specification with firm interaction terms, and we report the results in Table 6. To isolate small firms that are not subject to the employer mandate, we categorize individuals without paid jobs as working for a large firm. This specification is more complicated than our baseline specification, so it is less intuitive to examine the coefficients directly. However, we can synthesize all of the relevant information in the coefficients by plotting the empirical equilibria that map to the theoretical equilibria presented in Figure 1. Figure 6 plots the empirical equilibria. All equilibria are relative to equilibrium  $A$  (no ESHI before reform) at the origin.

The most important relationship to notice in Figure 6 is that equilibrium  $F$  (ESH I after reform) is to the lower left of equilibrium  $A$  (no ESHI before reform), as predicted by our theory. The relationship between  $A$  and  $F$  is the best-identified relationship in the figure. Our preferred estimate of the compensating differential for ESHI from Table 1 is the negative of the vertical distance between equilibrium  $A$  and equilibrium  $F$ . As depicted in Figure 6, the third column of Table 6 shows that  $w_F - w_A$  is equal to -\$2.91 per hour. Annualizing the point estimate for a full-time worker, the implied compensating differential is -\$6,058 per year, which is only slightly smaller in magnitude than the average cost of ESHI to employers. This suggests that the magnitude of our estimate is in a plausible range and that the penalty-and-subsidy-inclusive valuation is less than full. We obtain the annualized 95% confidence interval on the compensating differential of -\$8,611 to -\$4,098 per year by block-bootstrapping by state.<sup>14</sup>

<sup>14</sup>To obtain all confidence intervals, we perform a simple nonparametric block bootstrap. We first draw a sample

Table 6: Results from Preferred Specification

		(1) w Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)	(2) L Hours per week, including individuals without a paid job (hours=0)	(3) Compensating and Hours Differentials, Sufficient Statistics, and Welfare Impact of Health Reform		
MA*ESHI*After*Large	$\beta_1$	0.933** [0.031, 2.680]	$\gamma_1$	0.189 [-0.936, 1.289]	$w_D - w_A$	2.157*** [1.788, 2.455]
MA*ESHI*During*Large	$\beta_1^d$	-0.444 [-1.926, 1.079]	$\gamma_1^d$	-0.277 [-0.765, 0.610]	$w_F - w_B$	-0.231 [-0.634, 0.230]
MA*ESHI*Large	$\beta_8$	1.002** [0.231, 1.826]	$\gamma_8$	-1.159*** [-2.044, -0.618]	$w_D - w_B$	4.839*** [4.102, 5.865]
MA*After*Large	$\beta_{11}$	-2.682*** [-3.752, -2.021]	$\gamma_{11}$	-1.375** [-2.333, -0.459]	$w_F - w_A$	-2.913*** [-4.140, -1.970]
MA*During*Large	$\beta_{11}^d$	0.815 [-0.328, 2.185]	$\gamma_{11}^d$	0.144 [-0.669, 0.663]		
ESHI*After*Large	$\beta_{12}$	0.354 [-0.922, 1.394]	$\gamma_{12}$	-0.698 [-1.639, 0.247]	$L_D - L_A$	0.891** [0.039, 1.250]
ESHI*During*Large	$\beta_{12}^d$	0.567 [-0.712, 1.899]	$\gamma_{12}^d$	-0.780** [-1.366, -0.255]	$L_F - L_B$	-0.095 [-1.117, 0.511]
ESHI*Large	$\beta_{19}$	2.148*** [1.366, 2.732]	$\gamma_{19}$	7.097*** [6.563, 7.589]	$L_D - L_B$	2.266*** [1.002, 2.924]
After*Large	$\beta_{22}$	-0.848*** [-1.540, -0.113]	$\gamma_{22}$	-0.137 [-1.079, 0.521]	$L_F - L_A$	-1.470*** [-2.933, -0.678]
During*Large	$\beta_{22}^d$	-0.725* [-2.008, 0.095]	$\gamma_{22}^d$	0.099 [-0.497, 0.567]		
MA*Large	$\beta_{23}$	0.544 [-0.689, 3.426]	$\gamma_{23}$	3.868*** [0.705, 5.370]	$s$	0.19 -
Large	$\beta_{24}$	-3.903*** [-6.599, -3.057]	$\gamma_{24}$	-14.581*** [-15.765, -11.404]	$d$	-0.38 -
MA*ESHI*After	$\beta_{1e}$	-3.322*** [-5.130, -2.192]	$\gamma_{1e}$	-1.175** [-1.969, -0.393]	$\rho$	0.041*** [0.028, 0.057]
MA*ESHI*During	$\beta_{1e}^d$	-1.799** [-3.254, -0.238]	$\gamma_{1e}^d$	-1.787*** [-2.442, -1.147]	$b$	3.471*** [2.509, 5.001]
MA*ESHI	$\beta_{8e}$	1.155** [0.374, 1.915]	$\gamma_{8e}$	2.050*** [1.359, 2.476]	$\alpha$	-0.573*** [-0.860, -0.376]
MA*After	$\beta_{11e}$	5.378*** [4.626, 6.259]	$\gamma_{11e}$	3.169*** [2.411, 3.838]	$\lambda - \mu_x$	1.331*** [1.077, 1.588]
MA*During	$\beta_{11e}^d$	1.628** [0.218, 2.688]	$\gamma_{11e}^d$	2.543*** [1.925, 3.123]	$\alpha + \lambda - \mu_x$	0.759*** [0.587, 0.878]
ESHI*After	$\beta_{12e}$	-0.447 [-1.631, 1.058]	$\gamma_{12e}$	-0.307 [-1.001, 0.507]	$ESHI_{After}$	0.79 -
ESHI*During	$\beta_{12e}^d$	-0.678 [-2.065, 0.566]	$\gamma_{12e}^d$	-0.11 [-0.583, 0.460]	$\frac{b}{\tau}$	1 -
ESHI	$\beta_{19e}$	2.121*** [1.379, 2.753]	$\gamma_{19e}$	0.705*** [0.281, 1.022]		
After	$\beta_{22e}$	1.301*** [0.552, 1.991]	$\gamma_{22e}$	1.227*** [0.677, 1.904]	$DWL_m$	0.490*** [0.107, 1.940]
During	$\beta_{22e}^d$	1.058*** [0.241, 2.320]	$\gamma_{22e}^d$	0.849*** [0.440, 1.362]	$\frac{DWL_m}{DWL_\tau}$	0.046*** [0.012, 0.135]
Observations		495,420		479,374		
R-squared		0.759		0.842		

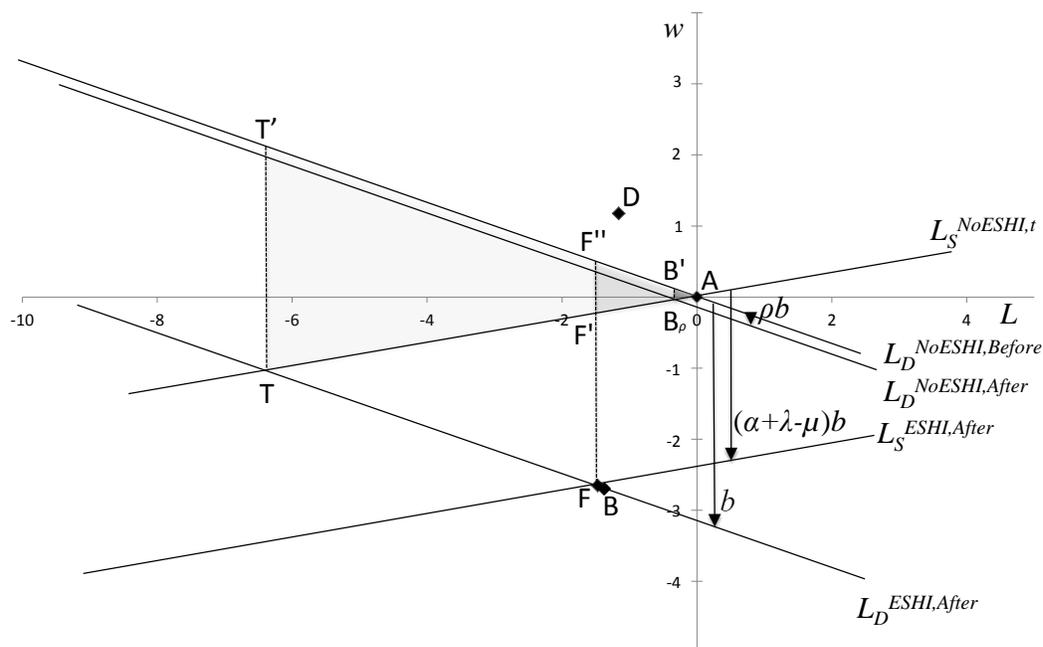
\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.

All specifications include individual, state, and state\*large firm fixed effects. Monthly weights used.

Large firm defined as >25 employees.

Figure 6: Empirical Estimates of Wage and Hours Equilibria



We obtain our preferred estimate of the hours differential for ESHI by taking the negative of the horizontal distance between equilibrium  $A$  and equilibrium  $F$ . As depicted in Figure 6, the third column of Table 6 shows that  $L_F - L_A$  is equal to -1.47 hours per week. This estimate is statistically different from zero at the 99% level, also suggesting that the penalty-and-subsidy-inclusive valuation is less than full.

Another key relationship to notice is that equilibrium  $B$  (no ESHI after reform) is also to the lower left of equilibrium  $A$  (no ESHI before reform), as predicted by our theory. However, the theory also predicts that equilibrium  $B$  should have higher wages than equilibrium  $F$  when the penalty is small (the hours comparison is ambiguous because it also depends on the magnitude of the penalty-and-subsidy-inclusive valuation), but empirically we see that equilibrium  $B$  has slightly lower wages than equilibrium  $F$ , leading to a wrong-signed compensating differential  $w_F - w_B$ . Because the relationship between equilibrium  $B$  and equilibrium  $A$  is not identified by changes in ESHI status due to reform, we have reason to doubt our identification of  $B$ .

Finally, theory tells us that equilibrium  $D$  (ESHI after reform) should be to the lower left of equilibrium  $A$  (no ESHI before reform), but the empirical equilibrium  $D$  is to the upper left of

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of 51 states with replacement — the data include all 50 US states and the District of Columbia — drawing all observations within a state as a block. We then estimate the wage and hours equations on the same sample, thus taking into account that the same individuals are used to estimate the wage and hours equations. To include as much data as possible, we drop observations with missing values of either outcome after selecting the replication sample, thereby assuming that individuals with missing data have the same behavior as those without missing data. We repeat the sampling process for 350 replications. For each quantity in column 3, we report the 0.025 quantile and the 0.975 quantile as our 95% confidence interval. We report significance when this confidence interval or the analogous 90% or 99% confidence interval does not include zero.

equilibrium  $A$ . As shown in the third column of Table 6, the compensating and hours differentials, based on equilibrium  $D$  are wrong-signed. The observed relationship between equilibrium  $D$  and equilibrium  $A$  is yet another manifestation of the well-known issue in the literature that it is difficult to find a correctly-signed compensating differential without exogenous variation in the benefit. Because we cannot convincingly identify  $D$ , we are not able to separately identify the components of the penalty-and-subsidy-inclusive valuation of health insurance,  $\alpha$  and  $\lambda - \mu$ . As shown in the third column of Table 6, our separate estimates of these parameters are nonsensical. Although these parameters would be interesting to analyze, we do not need to separately identify them to identify the aggregate welfare impact of mandate-based health reform.

## 7.2 Estimating the Welfare Impact of Health Reform

We next translate our preferred estimates of the compensating and hours differentials into the welfare impact of health reform. Up to this point, our results have come directly from the regression coefficients, and we have not made any calibrations. In theory, all of the sufficient statistics for the deadweight loss for health reform given by equation (1) are identified. However, as we discuss above, we have reason to believe that the identification for equilibrium  $B$  and equilibrium  $D$  is not convincing, and plotting the empirical equilibria gives us further cause to doubt their identification. For this reason, we rely only on the difference between labor market equilibria that is best-identified (equilibrium  $F$  relative to equilibrium  $A$ ), and calibrate other sufficient statistics as necessary.

We first translate our estimated compensating and hours differentials into our key sufficient statistics — the cost of ESHI to employers  $b$  and the penalty-and-subsidy-inclusive valuation  $\alpha + \lambda - \mu_x$ . We can see from the expressions in Table 2 and the geometry of Figure 6 that an estimate of the slope of the demand curve is sufficient to translate the compensating and hours differentials into  $b$ , and an estimate of the slope of the supply curve is sufficient to translate the compensating and hours differentials into  $\alpha + \lambda - \mu_x$ . Using elasticity estimates from the literature, discussed in Section 4.3, and average hours and wages for the full SIPP sample before reform, we set the slope of the supply curve equal to 0.19, and we set the slope of the demand curve equal to -0.38.<sup>15</sup> As shown in Figure 6 and in the third column of Table 6, we obtain a value of 3.47 for  $b$ , which translates into \$7,220 annually for a full-time worker. We obtain a value of 0.759 for the penalty-and-subsidy-inclusive valuation, which suggests that workers value health expenditures made by their employers at about 76 cents per dollar.

Next, we translate the penalty-and-subsidy-inclusive valuation of health insurance into the deadweight loss of mandate-based health reform for individuals who have ESHI after reform, depicted as triangle  $F'AF''$  in the theoretical and empirical figures. The area of the triangle is equal to 0.616, which translates into an annual deadweight loss of \$32 (=0.616\*52) for a full-time worker. This deadweight loss is only 6% of the size of the deadweight loss triangle associated with tax-based reform  $TAT'$ , assuming that the tax  $\tau$  is equal to the cost of the benefit to employers  $b$ .

<sup>15</sup>We report the calibrated values of  $s$  and  $d$  in Table 6 because we use them to calibrate the subsequent statistics. The estimated value for  $s$  is 1.95 with a 95% confidence interval of [1.12,6.13]\*\*\*, and the estimated value for  $d$  is 2.15 with a 95% confidence interval of [1.65,3.25]\*\*\*.

Finally, we calculate the deadweight loss of mandate-based health reform for individuals who do not have ESHI after reform, which requires an estimate of  $\rho$ . Rather than estimating  $\rho$  using equilibrium  $B$ , we calibrate it such that the dollar value of the employer penalty  $\rho b$  is equal to the statutory penalty of \$295/year. We plot the analog of equilibrium  $B$  that corresponds to the calibrated  $\rho$  as the point  $B_\rho$ . The associated welfare triangle is given by  $B_\rho AB'$ . The empirical area of this triangle is 0.0176, which translates into an annual deadweight loss of \$0.92 (=0.0176\*52) for a full-time worker.

To obtain the deadweight loss of mandate-based health reform,  $DWL_m$ , we weight the two triangles by ESHI status in Massachusetts after reform, setting  $ESHI_{After}$  equal to 0.79, according to our table of summary statistics. Putting everything together using equation (4), we find that the deadweight loss of mandate-based health reform is equal to \$25 per year for a full-time worker. Relative to tax-based health reform, mandate-based health reform is substantially more efficient: using equation (5), we calculate  $DWL_m/DWL_\tau = .046$ ; the distortions that mandate-based health reform induces are less than 5% of the distortions induced by tax-based health reform.<sup>16</sup>

### 7.3 Robustness to Calibrated Values

Thus far, we have discussed point estimates for the welfare impact of health reform, but we are also interested in their robustness. The confidence interval reported in Table 6 suggests that we are 95% certain that the deadweight loss of mandate-based health reform is between 1.2% and 13.5% of the deadweight loss of tax-based health reform. However, although the reported confidence intervals should be of the correct size for the compensating and hours differentials, the other confidence intervals should be too small because they reflect calibrated values, which were themselves estimated elsewhere. Therefore, it is instructive to consider robustness to alternative calibrated values.

First consider alternative values of  $\rho$  and  $ESHI_{After}$ . These values have little impact on our overall conclusion that mandate-based health reform is substantially more efficient than tax-based health reform in Massachusetts. Our preferred calibrated  $\rho$  is 0.041, reflecting that the statutory employer penalty of \$295 is approximately 4.1% of the estimated cost of ESHI  $\hat{b}$ . If we increase  $\rho$  such that the penalty is instead 25% of the estimated cost of ESHI, the deadweight loss for individuals without ESHI after reform is equal to the deadweight loss for individuals with ESHI after reform, which is approximately 6% of the deadweight loss of mandate-based health reform. In this case,  $ESHI_{After}$  has no impact because the size of both triangles is the same.

As discussed in Section 2, employer penalties under the ACA are substantially larger than those under the Massachusetts reform, up to a maximum of \$3,000 per employee annually, approximately 42% of the estimated cost of ESHI. However, the deadweight loss for individuals without ESHI

<sup>16</sup>We find that the deadweight loss of tax-based health reform is \$550 per year for a full-time worker. A tax of size  $\tau = b = \$3.47$  per hour, would raise \$4,140 per person per year ( $\$3.47$  per hour \* (29.03 hours per week in Massachusetts before reform - 6.09 hours per week after reform) \* 52 weeks per year), which would not be large enough to finance the estimated average annual cost of ESHI per worker of \$7,220. Therefore, we are conservative in setting  $\tau = b$ . Under the tax, the ratio of the deadweight loss to revenue raised is 0.13, which is on the lower end of the range but consistent with prominent estimates from the literature such as Ballard et al. (1985) and Feldstein (1999).

after mandate-based reform is only 17% of the deadweight loss of tax-based reform; this is because triangle  $B_{\rho}AB'$  grows with the square of the penalty, but triangle  $TAT'$  grows with the square of the cost of ESHI. Taking into account the triangle  $F'AF''$ , the overall welfare cost of mandate-based reform is only 8.2% of the welfare cost of tax-based reform.

Next, consider alternative values for the loading cost of ESHI relative to the loading cost of government-provided health insurance,  $b/\tau$ , keeping all other values the same as in our preferred specification. Suppose that ESHI costs 10% more to provide than government-provided health insurance because the government has economies of scale relative to employers, so  $b/\tau=1.1$ . The deadweight loss of tax-based health reform decreases to \$454 annually, but the deadweight loss of mandate-based health reform is still only 5.6% as large. Even if  $b/\tau=1.50$  such that ESHI costs 50% more to provide than government-provided health insurance, the deadweight loss of mandate-based health reform is still only 10.4% of the deadweight loss of tax-based health reform.

The last calibrated values to consider are the slope of the supply curve  $s$  and the slope of the demand curve  $d$ . To examine the effect of  $s$  and  $d$  on the ratio of the deadweight loss of mandate-based health reform to the deadweight loss of tax-based health reform, we see from equation (2) that the ratio of the deadweight loss of mandate-based health reform to the deadweight loss of tax-based health reform grows with the square of the percentage of the cost of ESHI that workers do not value:  $(1 - \alpha + \widehat{\lambda - \mu_x})$ . Using the expressions in Table 2, we can express this percentage in terms of the compensating and hours differentials, the slope of the demand curve, and the slope of the supply curve. We find that the relative deadweight loss of mandate-based reform increases as the slope of the labor supply curve increases (becomes more inelastic) and increases as the slope of the labor demand curve decreases (becomes more elastic). Holding demand constant, if we increase the calibrated labor supply elasticity from 0.1 to 0.2 (from  $s = 0.1 * 27.68/14.60 = 0.19$  to  $s = 0.38$ ), the relative deadweight loss increases to 8.2%. If we increase it further to 0.5 ( $s = 0.95$ ), the relative deadweight loss increases to 25%. Alternatively, holding supply constant, if we decrease the calibrated labor demand elasticity from -0.2 to -0.4 (from  $d = -0.2 * 27.68/14.60 = -0.38$  to  $d = -0.76$ ), the relative deadweight loss increases to 9.5%. If we decrease it further to -1.2 ( $d = -2.28$ ), the relative deadweight loss increases to 26.5%. Thus, the finding that mandate-based health reform is efficient relative to tax-based health reform is robust to changes in calibrated labor supply and demand.

The slopes of the supply and demand curves do, however, fix the incidence of the deadweight loss of health reform on employees versus their employers. As we can see from Figure 6, as supply becomes less elastic, a larger fraction of each deadweight loss triangle is below the  $L$  axis, demonstrating that employees bear more of the burden of reform. Conversely, as demand becomes less elastic, a larger fraction of each deadweight loss triangle is above the  $L$  axis, demonstrating that employers bear more of the burden of reform.

## 7.4 Robustness to Different Estimation Samples

Thus far, our model has taken individual ESHI takeup decisions as exogenous. Therefore, individuals who switched into ESHI because of reform are representative of all individuals, and we have estimated the penalty-and-subsidy-inclusive valuation for the population. However, we can extend our model to make ESHI status endogenous by allowing underlying valuations, and thus penalty-and-subsidy-inclusive valuations, to vary across individuals. In this extended model, after allowing for some optimization error, individuals with a penalty-and-subsidy-inclusive valuation above a certain threshold purchase health insurance in each period. Individuals with the highest intrinsic valuation of health insurance  $\alpha$  already have health insurance before reform. The reform will increase penalty-and-subsidy-inclusive valuations for some individuals, leading them to take up ESHI. Interpreted in light of the extended model, our estimates then reflect the average penalty-and-subsidy-inclusive valuation among individuals who take up ESHI. Therefore, our estimated valuation of 0.76 from our preferred specification suggests that individuals who take up ESHI because of reform value it at 76 cents on the dollar on average (even after taking the tax-preference for ESHI into account), so they would not have taken it up in the absence of reform.

Under the extended model with endogenous takeup of ESHI, we can test whether the penalty-and-subsidy-inclusive valuation (and thus the incidence of reform among employees) varies across different populations by estimating our model on subsets of our estimation sample. Under our original model, the same specifications test the robustness of our estimates to alternative samples and control groups. We examine our baseline and preferred specifications on three subsets of the full population: individuals in New England, those earning more than 300% of the FPL, and those who are married.

In the first column of Tables 7 and 8, we restrict our estimation sample to include only individuals in New England, on the grounds that Massachusetts might be more similar to other New England states than it is to the rest of the country. Table 7 reports results from the baseline specification on the New England sample. The estimates of  $\beta_1$  and  $\gamma_1$  (the compensating and hours differentials assuming that the employer penalty is zero, respectively), are slightly larger in magnitude than the corresponding estimates from the baseline specification. However, the 95% confidence intervals on both coefficients include the respective coefficients from the main sample. Furthermore, the compensating and hours differentials from the preferred specification are very similar to those from the main sample. In the sample that includes only New England, the annualized estimate of the cost of ESHI  $b$  is \$9,703, slightly larger than our main estimate (\$6,058), but the penalty-and-subsidy-inclusive valuation of 0.69 is very similar to our main estimate (0.76). Furthermore, the ratio of the deadweight loss of mandate-based health reform to the ratio of the deadweight loss of tax-based health reform is 7.7% — which is similar to our main estimate of 4.6%.

In the second column of Table 7, we restrict our estimation sample to include only individuals above 300% of the federal poverty level before reform. We classify individuals into income groups using the first period of available data to avoid regressing wages on contemporaneous measures of income. Individuals above 300% of FPL before reform are not eligible for any subsidies, which

Table 7: Results from Baseline Specification on Different Samples

	(1a)	(1b)	(1c)		(2a)	(2b)	(2c)
	w	w	w		L	L	L
	Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)	Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)	Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)		Hours per week, including individuals without a paid job (hours=0)	Hours per week, including individuals without a paid job (hours=0)	Hours per week, including individuals without a paid job (hours=0)
SAMPLE	New England	300%FPL+	Married		New England	300%FPL+	Married
MA*ESHI*After	$\beta_1$ -4.519*** [-8.666, -1.993]	-2.253*** [-2.763, -1.578]	-3.107*** [-3.919, -2.630]	$\gamma_1$	-2.564* [-4.076, 0.012]	-1.288*** [-2.041, -0.442]	0.135 [-0.559, 0.885]
MA*ESHI*During	$\beta_1^d$ -1.197 [-4.981, 2.383]	-2.306*** [-2.645, -1.530]	0.211 [-0.360, 0.559]	$\gamma_1^d$	-2.762** [-5.190, -0.376]	-3.337*** [-3.786, -2.628]	-1.791*** [-2.491, -1.341]
MA*ESHI	$\beta_8$ 3.343*** [1.762, 6.234]	1.479*** [0.893, 2.111]	1.385*** [0.838, 2.047]	$\gamma_8$	2.09 [-1.130, 3.967]	0.836 [-0.149, 1.330]	0.105 [-0.694, 0.551]
MA*After	$\beta_{11}$ 3.543*** [1.062, 7.300]	3.650*** [2.979, 3.970]	3.681*** [3.214, 4.309]	$\gamma_{11}$	2.094* [-0.447, 3.703]	2.167*** [1.297, 2.729]	0.790** [0.144, 1.441]
MA*During	$\beta_{11}^d$ 0.844 [-2.631, 4.889]	2.768*** [2.014, 3.048]	0.369* [-0.044, 0.945]	$\gamma_{11}^d$	3.225** [0.982, 5.361]	3.612*** [2.808, 4.004]	2.211*** [1.793, 2.895]
ESHI*After	$\beta_{12}$ 1.811 [-0.591, 5.922]	-0.239 [-0.906, 0.380]	-0.309 [-0.863, 0.262]	$\gamma_{12}$	0.428 [-1.994, 2.161]	-0.958** [-1.471, -0.189]	-0.565 [-1.080, 0.268]
ESHI*During	$\beta_{12}^d$ -1.186 [-4.582, 2.568]	-0.325 [-0.979, 0.115]	-0.323 [-0.675, 0.152]	$\gamma_{12}^d$	-0.358 [-2.662, 2.112]	-0.701*** [-1.193, -0.149]	-0.567* [-0.883, 0.158]
ESHI	$\beta_{19}$ 2.283* [-0.304, 3.895]	4.320*** [3.625, 4.735]	3.936*** [3.326, 4.259]	$\gamma_{19}$	5.184*** [3.013, 7.783]	6.338*** [5.660, 6.684]	5.975*** [5.307, 6.356]
After	$\beta_{22}$ -0.017 [-3.745, 2.249]	0.594** [0.095, 1.100]	-0.309* [-0.878, 0.063]	$\gamma_{22}$	1.239 [-0.494, 3.713]	1.114*** [0.440, 1.687]	-0.725** [-1.501, -0.127]
During	$\beta_{22}^d$ 1.837 [-2.200, 5.082]	0.718*** [0.334, 1.303]	-0.046 [-0.530, 0.283]	$\gamma_{22}^d$	0.554 [-1.647, 2.646]	0.907*** [0.395, 1.402]	-0.252 [-0.945, 0.137]
Observations	28,857	345,287	258,222		27,925	333,106	246,483
R-squared	0.715	0.764	0.826		0.841	0.83	0.852

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.

Individual and state fixed effects included. Monthly weights used.

New England states include MA, CT, NH, VT, ME, RI.

300%FPL+ sample includes those who DO NOT fall into the <150%FPL or 150-300%FPL categories

means that their penalty-and-subsidy-inclusive valuation should be higher. As we show in the second column of Table 8, the point estimate for the penalty-and-subsidy-inclusive valuation in this sample is indeed much higher than it is in the main specification — it is almost full. Because the penalty-and-subsidy-inclusive valuation in this sample is so large, mandate-based health reform causes minimal distortion to the labor market. The ratio of the deadweight loss of mandate-based health reform to that of tax-based health reform is 0.3%.

In the third columns of Tables 7 and 8, we restrict our estimation sample to include only married individuals. Married individuals could value ESHI less than other individuals if they have health insurance options available through their spouses; alternatively, they could also value it more if their spouse relies on them for insurance. Empirically, we see in Table 8 that the valuation of ESHI for married individuals is approximately 0.80, with a 95% confidence interval of 0.74 to 0.88, slightly larger than the valuation of ESHI for the full sample.

Table 8: Results from Preferred Specification on Different Samples

SAMPLE		(1a)	(1b)	(1c)		(2a)	(2b)	(2c)		(3a)	(3b)	(3c)
		w	w	w		L	L	L		Compensating and Hours Differentials, Sufficient Statistics, and Welfare Impact of Health Reform		
		Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)	Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)	Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)		Hours per week, including individuals without a paid job (hours=0)	Hours per week, including individuals without a paid job (hours=0)	Hours per week, including individuals without a paid job (hours=0)				
MA*ESHI*After*Large	$\beta_1$	0.443	0.252	1.470*	$\gamma_1$	-2.879	0.699	-0.548	$w_D - w_A$	3.080***	1.817***	0.909***
		[-4.665, 2.914]	[-1.525, 2.648]	[-0.100, 3.070]		[-8.848, 5.634]	[-0.730, 2.170]	[-2.976, 0.790]		[1.904, 4.632]	[1.276, 2.382]	[0.278, 1.453]
MA*ESHI*During*Large	$\beta_1^d$	-0.618	-2.623***	-0.34	$\gamma_1^d$	0.425	-3.615***	1.123*	$w_F - w_B$	-1.414	-0.143	-2.223***
		[-3.897, 5.692]	[-5.158, -0.474]	[-1.575, 1.176]		[-4.104, 3.762]	[-4.583, -2.684]	[-0.420, 1.927]		[-5.975, 1.283]	[-0.581, 0.478]	[-2.945, -1.804]
MA*ESHI*Large	$\beta_8$	-0.213	1.992***	-2.252***	$\gamma_8$	-2.6283	1.104**	-7.098***	$w_D - w_B$	5.359*	2.806***	8.155***
		[-4.935, 4.052]	[0.829, 3.034]	[-3.503, -1.245]		[-5.602, -0.375]	[0.043, 1.799]	[-8.091, -6.006]		[-0.480, 11.195]	[1.384, 4.219]	[6.920, 9.401]
MA*After*Large	$\beta_{11}$	-2.278	-0.989	-7.246***	$\gamma_{11}$	0.252	-0.205	-2.598**	$w_F - w_A$	-3.692	-1.132	-9.468***
		[-7.478, 2.931]	[-2.563, 0.393]	[-8.574, -5.837]		[-5.775, 4.938]	[-1.443, 1.085]	[-3.813, -0.013]		[-9.708, 2.639]	[-2.893, 0.530]	[-11.035, -8.134]
MA*During*Large	$\beta_{11}^d$	0.837	3.435***	-0.822	$\gamma_{11}^d$	-1.480**	3.224***	-1.521*				
		[-5.600, 4.714]	[1.648, 6.208]	[-1.950, 0.487]		[-3.037, -0.288]	[2.474, 3.970]	[-2.200, 0.209]				
ESHI*After*Large	$\beta_{12}$	0.972	0.234	0.347	$\gamma_{12}$	2.628	-0.246	-0.356	$L_D - L_A$	1.042	0.593	-1.499***
		[-1.160, 5.105]	[-1.620, 1.885]	[-1.144, 1.521]		[-5.688, 8.279]	[-1.403, 0.977]	[-1.584, 1.803]		[-2.438, 2.844]	[-0.388, 1.037]	[-2.370, -1.037]
ESHI*During*Large	$\beta_{12}^d$	0.906	1.385	-0.225	$\gamma_{12}^d$	-0.953	-0.07	-0.592	$L_F - L_B$	-2.812**	0.198	-1.335***
		[-5.213, 3.806]	[-0.467, 3.688]	[-1.549, 0.862]		[-4.236, 2.744]	[-0.825, 6.658]	[-1.456, 0.750]		[-4.211, -1.566]	[-0.878, 0.813]	[-2.579, -0.319]
ESHI*Large	$\beta_{19}$	3.205	2.227***	2.413***	$\gamma_{19}$	8.0353	6.621***	7.216***	$L_D - L_B$	0.789	0.798	1.099
		[-0.429, 7.525]	[1.151, 3.007]	[1.439, 3.469]		[6.186, 10.857]	[5.999, 7.349]	[6.194, 8.141]		[-5.022, 5.373]	[-0.563, 1.617]	[-1.410, 2.395]
After*Large	$\beta_{22}$	-1.596	-0.628	-0.472	$\gamma_{22}$	-2.219	-0.597	-0.897	$L_F - L_A$	-2.560	-0.007	-3.932***
		[-6.807, 3.098]	[-2.050, 0.609]	[-1.749, 0.591]		[-6.483, 3.405]	[-1.859, 0.412]	[-3.246, 0.425]		[-7.679, 1.929]	[-1.352, 0.978]	[-5.101, -2.140]
During*Large	$\beta_{22}^d$	-1.082	-1.221	0.038	$\gamma_{22}^d$	1.031**	-0.383	-0.091				
		[-4.545, 4.924]	[-3.704, 0.172]	[-1.189, 0.937]		[0.258, 2.935]	[-1.076, 0.228]	[-1.675, 0.828]				
MA*Large	$\beta_{23}$	4.388	-0.659	2.571**	$\gamma_{23}$	8.518**	2.827	14.843***	$s$	0.190	0.190	0.190
		[-2.335, 7.951]	[-6.595, 1.810]	[0.434, 4.757]		[1.823, 11.647]	[-2.444, 4.605]	[2.420, 16.196]		-	-	-
Large	$\beta_{24}$	-7.528**	-4.424	-3.117***	$\gamma_{24}$	-18.8453	-15.181***	-17.351***	$d$	-0.380	-0.380	-0.380
		[-10.796, -0.855]	[-6.572, 1.538]	[-5.075, -1.383]		[-21.619, -12.260]	[-16.691, -10.002]	[-18.652, -4.772]		-	-	-
MA*ESHI*After	$\beta_{1e}$	-4.937**	-2.212***	-4.601**	$\gamma_{1e}$	-0.975	-1.093*	0.712*	$\rho$	0.030	0.125	0.013***
		[-7.889, -0.929]	[-4.533, -0.347]	[-6.318, -3.244]		[-5.927, 4.459]	[-2.043, 0.008]	[-0.218, 2.285]		[-0.141, 0.247]	[-0.948, 2.214]	[0.011, 0.015]
MA*ESHI*During	$\beta_{1e}^d$	-0.732	-0.034	0.588	$\gamma_{1e}^d$	-3.079	0.388	-2.374***	$b$	4.665	1.135	10.963***
		[-8.839, 3.209]	[-2.018, 2.522]	[-0.822, 1.718]		[-6.888, 0.223]	[-0.335, 1.364]	[-3.094, -1.595]		[-2.107, 12.087]	[-0.521, 3.077]	[9.699, 12.515]
MA*ESHI	$\beta_{8e}$	3.294	-0.174	3.161***	$\gamma_{8e}$	3.669*	-0.511*	5.599***	$\alpha$	-0.618	-1.502	-0.109**
		[-1.224, 9.607]	[-1.254, 0.960]	[2.101, 4.483]		[-0.634, 6.720]	[-1.279, 0.060]	[4.449, 6.306]		[-5.598, 2.991]	[-30.958, 13.484]	[-0.168, -0.052]
MA*After	$\beta_{11e}$	5.446*	4.220***	10.257***	$\gamma_{11e}$	2.602	1.554***	2.979***	$\lambda - \mu_x$	1.305	2.499	0.904**
		[-0.818, 11.705]	[2.751, 5.555]	[9.113, 11.408]		[-2.333, 6.404]	[0.473, 2.244]	[1.227, 3.747]		[-1.476, 6.058]	[-15.340, 27.383]	[0.840, 1.035]
MA*During	$\beta_{11e}^d$	0.206	-0.172	0.968*	$\gamma_{11e}^d$	4.4463	0.26	3.119***	$\alpha + \lambda - \mu_x$	0.687*	0.996*	0.796**
		[-4.579, 8.676]	[-2.787, 1.350]	[-0.161, 2.044]		[1.649, 6.775]	[-0.532, 0.791]	[2.141, 3.712]		[-0.666, 2.233]	[-2.116, 3.341]	[0.740, 0.878]
ESHI*After	$\beta_{12e}$	1.085	-0.495	-0.717	$\gamma_{12e}$	-0.714	-0.692	-0.274	$ESHI_{After}$	0.790	0.790	0.790
		[-2.534, 3.976]	[-2.256, 1.542]	[-1.913, 0.905]		[-5.726, 4.226]	[-1.546, 0.256]	[-1.616, 0.623]		-	-	-
ESHI*During	$\beta_{12e}^d$	-1.853	-1.545*	-0.207	$\gamma_{12e}^d$	0.747	-0.711*	-0.103	$\frac{b}{\tau}$	1.000	1.000	1.000
		[-5.510, 5.839]	[-3.905, 0.246]	[-1.259, 1.062]		[-2.202, 4.526]	[-1.459, 0.025]	[-0.814, 0.643]		-	-	-
ESHI	$\beta_{19e}$	-0.167	2.543***	2.065***	$\gamma_{19e}$	-1.148	0.999**	0.269				
		[-5.941, 3.934]	[1.528, 3.501]	[0.798, 2.863]		[-4.292, 2.466]	[0.179, 1.530]	[-0.424, 0.925]				
After	$\beta_{22e}$	1.29	1.206*	0.218	$\gamma_{22e}$	1.948	1.527***	0.056	$DWL_m$	1.479***	0.004***	3.486**
		[-4.078, 7.095]	[-0.103, 2.519]	[-0.857, 1.228]		[-1.737, 6.424]	[0.776, 2.400]	[-0.770, 1.600]		[0.012, 13.313]	[0.004, 0.468]	[1.035, 5.864]
During	$\beta_{22e}^d$	2.64	1.800***	0.012	$\gamma_{22e}^d$	-0.653	1.270***	-0.131	$\frac{DWL_m}{DWL_\tau}$	0.077***	0.003***	0.033***
		[-5.150, 7.209]	[0.427, 4.190]	[-0.846, 1.092]		[-3.404, 1.811]	[0.692, 1.962]	[-0.755, 0.712]		[0.004, 2.198]	[0.001, 18.630]	[0.012, 0.053]
Observations		28,857	345,287	258,222		27,925	333,106	246,483				
R-squared		0.716	0.764	0.826		0.849	0.838	0.858				

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.  
 Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.  
 All specifications include individual, state, and state\*large firm fixed effects. Monthly weights used.  
 Large firm defined as >25 employees.  
 New England states include MA, CT, NH, VT, ME, RI.  
 300%FPL+ sample includes those who DO NOT fall into the <150%FPL or 150-300%FPL categories

## 7.5 Robustness to Intensive Margin Only

Thus far, we have not distinguished the extensive margin decision of whether to work at all from the intensive margin decision to work a different number of hours in our measure of  $L$ . Instead, we have attempted to capture the broadest possible impact of reform by allowing for responses on the intensive and extensive margins. However, previous research, including Cutler and Madrian (1998), shows that ESHI could have different impacts on employment than it does on hours because ESHI has a fixed cost, regardless of hours worked.

We now investigate whether we observe responses on the intensive margin and whether the distinction between the intensive and extensive margins affects our findings. We first restrict our sample to include only individuals with a paid job and positive wages in a given period. We then further restrict our sample to include only individuals with a paid job and positive wages over the entire period, and then further to include only individuals with no job switch over the entire period. We adjust the calibrated values of  $s$  and  $d$  to reflect the higher average wages and hours. Because these three samples only include people with positive wages and hours, we can also estimate logarithmic specifications without losing any information. In the logarithmic specifications, our theoretical graph stays the same, the axes change from  $w$  to  $\log(w)$  and from  $L$  to  $\log(L)$ . With the change in axes, the compensating differential and the cost of the benefit are percentages of wages instead of dollar amounts, and the hours differential is a percentage of hours. However, the units of the penalty-and-subsidy-inclusive valuation and the deadweight loss ratio do not change.

Table 9 presents results from the baseline specification on the three samples of workers, using levels and logarithms of the dependent variables. In all samples, our estimates of  $\beta_1$  give evidence of a compensating differential, assuming no employer penalty. The logarithmic specifications show a compensating differential from 9% to 12% of income, broadly consistent with our main results. The estimates of  $\gamma_1$ , however, do not show any evidence in any of the samples of an hours differential that is significant at the 95% level. This result for individuals with paid jobs suggests that much of the decline in hours that we observe in the main sample is driven by the extensive margin decision of whether to work.

In the results from the preferred specification restricted to workers, shown in Table 10, we continue to observe a compensating differential. Interestingly, our compensating differential findings do not appear to be driven exclusively by individuals who switch ESHI status by changing jobs — we still estimate a compensating differential when we only use variation from individuals who switch ESHI status within the same job. In all three samples, the penalty-and-subsidy-inclusive valuation is smaller in the level specifications and larger in the log specifications. The ratio of the deadweight loss of mandate-based health reform to the deadweight loss of tax-based health reform varies from 4.2% to 18.5% across all six specifications, and the largest upper bound of the 95% confidence interval is 29%.

Overall, our results that include only the intensive margin decision are consistent with our main results, suggesting that the extensive margin decision of whether to work does not drive our

Table 9: Results from Baseline Specification to Investigate Intensive Margin

	(1a) w	(1b) Log(w)	(1c) w	(1d) Log(w)	(1e) w	(1f) Log(w)
	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week
SAMPLE	<i>Workers with a paid job and wages&gt;0 in the given period</i>		<i>Workers with a paid job and wages&gt;0 over the entire period</i>		<i>Workers with a paid job and wages&gt;0 and no job switch over the entire period</i>	
MA*ESHI*After $\beta_1$	-4.580*** [-5.201, -3.899]	-0.116*** [-0.142, -0.085]	-4.401*** [-5.099, -3.658]	-0.097*** [-0.122, -0.066]	-5.482*** [-6.153, -4.624]	-0.120*** [-0.147, -0.083]
MA*ESHI*During $\beta_1^d$	-3.958*** [-4.515, -2.929]	-0.213*** [-0.235, -0.177]	-4.101*** [-4.633, -3.118]	-0.233*** [-0.266, -0.200]	-4.414*** [-5.065, -3.418]	-0.244*** [-0.281, -0.203]
MA*ESHI $\beta_8$	3.552*** [2.986, 3.851]	0.107*** [0.083, 0.124]	3.385*** [2.680, 3.779]	0.108*** [0.073, 0.130]	4.033*** [3.215, 4.467]	0.123*** [0.088, 0.148]
MA*After $\beta_{11}$	4.881*** [4.372, 5.356]	0.139*** [0.112, 0.166]	4.960*** [4.324, 5.434]	0.122*** [0.095, 0.144]	5.624*** [4.942, 6.089]	0.135*** [0.101, 0.158]
MA*During $\beta_{11}^d$	3.808*** [2.913, 4.250]	0.217*** [0.185, 0.234]	4.224*** [3.346, 4.704]	0.240*** [0.210, 0.268]	4.505*** [3.601, 5.051]	0.257*** [0.223, 0.287]
ESHI*After $\beta_{12}$	-0.674** [-1.319, -0.053]	-0.069*** [-0.097, -0.037]	-0.57 [-1.242, 0.240]	-0.055*** [-0.080, -0.031]	-0.546 [-1.317, 0.199]	-0.054*** [-0.088, -0.027]
ESHI*During $\beta_{12}^d$	-0.663** [-1.384, -0.177]	-0.039*** [-0.063, -0.021]	-0.617** [-1.349, -0.105]	-0.033** [-0.057, -0.006]	-0.698** [-1.550, -0.069]	-0.030* [-0.058, 0.005]
ESHI $\beta_{19}$	2.368*** [1.920, 2.754]	0.171*** [0.150, 0.182]	2.258*** [1.846, 2.590]	0.167*** [0.143, 0.179]	2.145*** [1.711, 2.601]	0.155*** [0.132, 0.168]
After $\beta_{22}$	2.198*** [1.663, 2.595]	0.130*** [0.098, 0.152]	1.842*** [1.356, 2.175]	0.104*** [0.079, 0.123]	1.534*** [1.068, 2.003]	0.090*** [0.062, 0.117]
During $\beta_{22}^d$	1.600*** [1.091, 2.287]	0.082*** [0.060, 0.104]	1.406*** [0.944, 2.087]	0.071*** [0.043, 0.094]	1.272*** [0.737, 2.061]	0.057*** [0.022, 0.084]
Observations	327,388	327,388	281,457	281,457	262,988	262,988
R-squared	0.792	0.776	0.806	0.791	0.809	0.8
	(2b) Log(L)	(2c) L	(2d) Log(L)	(2e) L	(2f) Log(L)	
	Hours per week	Hours per week	Hours per week	Hours per week	Hours per week	
SAMPLE	<i>Workers with a paid job and wages&gt;0 in the given period</i>		<i>Workers with a paid job and wages&gt;0 over the entire period</i>		<i>Workers with a paid job and wages&gt;0 and no job switch over the entire period</i>	
MA*ESHI*After $\gamma_1$	-0.207 [-0.580, 0.256]	-0.011 [-0.025, 0.009]	0.29 [-0.181, 0.792]	0.022** [0.003, 0.043]	-0.622* [-1.218, 0.004]	-0.018 [-0.042, 0.004]
MA*ESHI*During $\gamma_1^d$	-1.890*** [-2.181, -1.525]	-0.046*** [-0.057, -0.031]	-1.681*** [-2.111, -1.304]	-0.017* [-0.033, 0.001]	-2.285*** [-2.788, -1.897]	-0.044*** [-0.065, -0.026]
MA*ESHI $\gamma_8$	1.750*** [1.158, 2.160]	0.047*** [0.026, 0.059]	2.251*** [1.626, 2.758]	0.076*** [0.053, 0.095]	2.367*** [1.708, 2.955]	0.082*** [0.059, 0.103]
MA*After $\gamma_{11}$	0.802*** [0.253, 1.127]	0.037*** [0.019, 0.050]	-0.106 [-0.739, 0.342]	-0.008 [-0.029, 0.008]	0.667* [-0.146, 1.193]	0.026** [0.002, 0.047]
MA*During $\gamma_{11}^d$	2.307*** [1.809, 2.560]	0.060*** [0.043, 0.069]	1.988*** [1.543, 2.346]	0.032*** [0.014, 0.045]	2.788*** [2.320, 3.168]	0.068*** [0.049, 0.082]
ESHI*After $\gamma_{12}$	-1.035*** [-1.451, -0.655]	-0.040*** [-0.054, -0.024]	-0.773*** [-1.193, -0.349]	-0.028*** [-0.040, -0.012]	-0.713** [-1.284, -0.279]	-0.025** [-0.040, -0.008]
ESHI*During $\gamma_{12}^d$	-0.722*** [-0.913, -0.553]	-0.025*** [-0.032, -0.015]	-0.702*** [-0.941, -0.423]	-0.024*** [-0.035, -0.014]	-0.644*** [-0.947, -0.324]	-0.022*** [-0.033, -0.009]
ESHI $\gamma_{19}$	2.002*** [1.713, 2.166]	0.072*** [0.061, 0.079]	1.935*** [1.604, 2.098]	0.066*** [0.054, 0.073]	1.818*** [1.446, 2.058]	0.062*** [0.049, 0.070]
After $\gamma_{22}$	1.231*** [0.869, 1.623]	0.056*** [0.042, 0.068]	0.705*** [0.306, 1.146]	0.031*** [0.017, 0.043]	0.573** [0.131, 1.219]	0.026*** [0.009, 0.040]
During $\gamma_{22}^d$	0.953*** [0.764, 1.174]	0.038*** [0.029, 0.045]	0.819*** [0.536, 1.105]	0.032*** [0.021, 0.043]	0.694*** [0.358, 0.990]	0.028*** [0.014, 0.039]
Observations	320,720	320,720	268,488	268,488	251,033	251,033
R-squared	0.769	0.754	0.754	0.737	0.765	0.749

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.  
Individual and state fixed effects included. Monthly weights used.

Table 10: Results from Preferred Specification to Investigate Intensive Margin

		(1a) w	(1b) Log(w)	(1c) w	(1d) Log(w)	(1e) w	(1f) Log(w)
		Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week	Weekly earnings / baseline hours per week
SAMPLE		<i>Workers with a paid job and wages&gt;0 in the given period</i>		<i>Workers with a paid job and wages&gt;0 over the entire period</i>		<i>Workers with a paid job and wages&gt;0 and no job switch over the entire period</i>	
MA*ESHI*After*Large	$\beta_1$	1.526*** [0.507, 3.098]	0.410*** [0.358, 0.480]	4.032*** [2.989, 5.594]	0.710*** [0.647, 0.774]	3.209*** [2.134, 4.899]	0.709*** [0.655, 0.779]
MA*ESHI*During*Large	$\beta_1^d$	-1.568* [-2.938, 0.169]	-0.006 [-0.048, 0.048]	-1.178 [-2.839, 0.788]	0.067*** [0.006, 0.124]	-0.589 [-2.504, 1.444]	0.097*** [0.029, 0.160]
MA*ESHI*Large	$\beta_8$	3.355*** [2.472, 4.354]	0.112*** [0.079, 0.137]	3.611*** [2.678, 4.609]	0.103*** [0.062, 0.141]	3.710*** [2.513, 4.817]	0.111*** [0.068, 0.145]
MA*After*Large	$\beta_{11}$	-3.254*** [-4.458, -2.011]	-0.471*** [-0.547, -0.404]	-6.806*** [-7.869, -5.482]	-0.757*** [-0.826, -0.690]	-6.580*** [-7.781, -5.288]	-0.782*** [-0.853, -0.723]
MA*During*Large	$\beta_{11}^d$	1.068 [-0.259, 2.840]	0.001 [-0.051, 0.045]	-0.144 [-1.546, 1.938]	-0.144 [-0.151, -0.039]	-0.747 [-2.285, 1.626]	-0.133*** [-0.194, -0.063]
ESHI*After*Large	$\beta_{12}$	-0.895 [-2.225, 0.344]	-0.077*** [-0.138, -0.010]	-0.541 [-1.684, 0.628]	-0.063* [-0.118, 0.005]	0.054 [-1.254, 1.258]	-0.044 [-0.098, 0.028]
ESHI*During*Large	$\beta_{12}^d$	-0.251 [-1.702, 1.450]	-0.074*** [-0.118, -0.020]	0.54 [-1.067, 2.243]	-0.048 [-0.099, 0.014]	0.747 [-1.089, 2.685]	-0.039 [-0.097, 0.024]
ESHI*Large	$\beta_{19}$	1.298*** [0.398, 1.923]	0.090*** [0.064, 0.110]	1.170** [0.245, 1.941]	0.074*** [0.046, 0.106]	0.858 [-0.220, 1.723]	0.060*** [0.034, 0.092]
After*Large	$\beta_{22}$	1.018 [-0.361, 2.254]	0.057 [-0.015, 0.123]	1.024 [-0.310, 1.906]	0.053 [-0.016, 0.107]	0.702 [-0.681, 1.760]	0.042 [-0.019, 0.099]
During*Large	$\beta_{22}^d$	0.371 [-1.359, 1.408]	0.048 [-0.008, 0.093]	-0.221 [-2.010, 0.933]	0.028 [-0.033, 0.074]	-0.22 [-2.306, 1.086]	0.029 [-0.033, 0.078]
MA*Large	$\beta_{23}$	0.712 [-2.178, 4.198]	0.094 [-0.020, 0.211]	0.87 [-3.162, 3.531]	0.106 [-0.133, 0.185]	-0.549 [-4.742, 2.907]	0.075 [-0.223, 0.172]
Large	$\beta_{24}$	-1.131 [-4.431, 1.882]	-0.091 [-0.198, 0.024]	-1.675 [-4.027, 2.640]	-0.187 [-0.253, 0.044]	-0.508 [-3.687, 3.923]	-0.147 [-0.227, 0.146]
MA*ESHI*After	$\beta_{1e}$	-4.972*** [-6.371, -4.065]	-0.354*** [-0.401, -0.312]	-6.511*** [-7.743, -5.543]	-0.578*** [-0.636, -0.530]	-6.777*** [-8.039, -5.810]	-0.577*** [-0.636, -0.534]
MA*ESHI*During	$\beta_{1e}^d$	-2.777*** [-4.109, -1.085]	-0.205*** [-0.249, -0.149]	-3.006*** [-4.481, -1.279]	-0.264*** [-0.318, -0.207]	-3.615*** [-5.301, -1.835]	-0.286*** [-0.351, -0.225]
MA*ESHI	$\beta_{8e}$	0.953* [-0.003, 1.736]	0.017 [-0.015, 0.047]	0.508 [-0.488, 1.362]	0.022 [-0.021, 0.064]	1.169** [0.012, 1.975]	0.035 [-0.008, 0.076]
MA*After	$\beta_{11e}$	6.775*** [5.814, 7.540]	0.431*** [0.376, 0.482]	9.480*** [8.464, 10.341]	0.643*** [0.593, 0.693]	9.829*** [8.674, 10.725]	0.655*** [0.604, 0.710]
MA*During	$\beta_{11e}^d$	3.059*** [1.266, 4.072]	0.214*** [0.161, 0.255]	4.283*** [2.321, 5.358]	0.299*** [0.247, 0.349]	4.887*** [2.695, 6.025]	0.330*** [0.271, 0.383]
ESHI*After	$\beta_{12e}$	-0.179 [-1.294, 1.130]	-0.019 [-0.068, 0.025]	-0.393 [-1.461, 0.739]	-0.015 [-0.067, 0.030]	-0.829 [-2.012, 0.289]	-0.03 [-0.080, 0.015]
ESHI*During	$\beta_{12e}^d$	-0.522 [-2.148, 0.765]	0.012 [-0.038, 0.049]	-0.988 [-2.601, 0.428]	0.001 [-0.048, 0.050]	-1.261 [-3.065, 0.464]	-0.005 [-0.058, 0.052]
ESHI	$\beta_{19e}$	1.399*** [0.664, 2.213]	0.103*** [0.079, 0.125]	1.386*** [0.535, 2.215]	0.111*** [0.075, 0.136]	1.515*** [0.635, 2.397]	0.110*** [0.071, 0.137]
After	$\beta_{22e}$	1.599*** [0.865, 2.419]	0.096*** [0.055, 0.146]	1.252*** [0.495, 2.162]	0.074*** [0.039, 0.119]	1.179*** [0.301, 2.281]	0.068*** [0.031, 0.117]
During	$\beta_{22e}^d$	1.363*** [0.440, 3.055]	0.053*** [0.022, 0.098]	1.509*** [0.501, 3.317]	0.055*** [0.016, 0.101]	1.396** [0.271, 3.442]	0.042* [-0.006, 0.091]
Observations		327,388	327,388	281,457	281,457	262,988	262,988
R-squared		0.793	0.776	0.806	0.792	0.809	0.801

Table 10: Results from Baseline Specification to Investigate Intensive Margin (Continued)

SAMPLE		(2a)	(2b)	(2c)	(2d)	(2e)	(2f)
		L	Log(L)	L	Log(L)	L	Log(L)
		Hours per week	Hours per week	Hours per week	Hours per week	Hours per week	Hours per week
		<i>Workers with a paid job and wages&gt;0 in the given period</i>		<i>Workers with a paid job and wages&gt;0 over the entire period</i>		<i>Workers with a paid job and wages&gt;0 and no job switch over the entire period</i>	
MA*ESHI*After*Large	$\gamma_1$	5.857*** [5.445, 6.683]	0.253*** [0.239, 0.286]	13.670*** [12.620, 14.873]	0.597*** [0.564, 0.641]	13.557*** [12.685, 14.890]	0.583*** [0.550, 0.631]
MA*ESHI*During*Large	$\gamma_1^d$	2.112*** [1.573, 2.724]	0.073*** [0.054, 0.098]	5.977*** [5.009, 6.769]	0.208*** [0.173, 0.245]	5.444*** [4.356, 6.216]	0.188*** [0.151, 0.225]
MA*ESHI*Large	$\gamma_8$	1.412*** [0.771, 1.817]	0.054*** [0.034, 0.065]	-0.104 [-0.842, 0.466]	0.007 [-0.022, 0.024]	0.039 [-0.722, 0.763]	0.01 [-0.022, 0.030]
MA*After*Large	$\gamma_{11}$	-6.594*** [-7.328, -5.928]	-0.319*** [-0.347, -0.301]	-13.807*** [-14.858, -12.692]	-0.647*** [-0.686, -0.615]	-13.516*** [-14.485, -12.555]	-0.634*** [-0.675, -0.604]
MA*During*Large	$\gamma_{11}^d$	-1.369*** [-3.021, -1.678]	0.038*** [-0.136, -0.089]	-1.125*** [-7.108, -5.407]	-0.042*** [-0.282, -0.215]	-1.030*** [-6.473, -4.736]	-0.039*** [-0.259, -0.188]
ESHI*After*Large	$\gamma_{12}$	-1.923*** [-1.369***, -0.774]	-0.080*** [-0.080, -0.035]	-1.957*** [-1.957, -0.221]	-0.073*** [-0.073, -0.012]	-1.905*** [-1.905, -0.359]	-0.077*** [-0.077, -0.013]
ESHI*During*Large	$\gamma_{12}^d$	-0.997*** [-1.341, -0.523]	-0.040*** [-0.054, -0.022]	-0.890*** [-1.466, -0.222]	-0.031*** [-0.057, -0.004]	-0.718*** [-1.376, -0.018]	-0.027*** [-0.055, 0.000]
ESHI*Large	$\gamma_{19}$	1.091*** [0.799, 1.353]	0.024*** [0.028, 0.048]	1.071*** [0.762, 1.388]	0.036*** [0.024, 0.051]	0.736*** [0.381, 1.149]	0.026*** [0.010, 0.044]
After*Large	$\gamma_{22}$	0.808*** [0.143, 1.320]	0.024*** [0.003, 0.041]	0.797 [-0.237, 1.530]	0.025 [-0.007, 0.054]	0.759*** [0.012, 1.401]	0.021 [-0.007, 0.055]
During*Large	$\gamma_{22}^d$	0.590*** [0.009, 0.973]	0.016 [-0.004, 0.031]	0.644* [-0.107, 1.175]	0.016 [-0.015, 0.040]	0.565 [-0.249, 1.154]	0.014 [-0.019, 0.041]
MA*Large	$\gamma_{23}$	4.259 [-4.833, 5.149]	0.186 [-0.239, 0.217]	4.538 [-7.003, 5.542]	0.147 [-0.392, 0.185]	3.592 [-6.421, 4.804]	0.137 [-0.169, 0.179]
Large	$\gamma_{24}$	-4.252 [-4.691, 4.798]	-0.164 [-0.182, 0.265]	-3.874 [-4.283, 7.711]	-0.118 [-0.139, 0.421]	-2.91 [-3.491, 7.130]	-0.109 [-0.139, 0.198]
MA*ESHI*After	$\gamma_{1e}$	-3.909*** [-4.810, -3.322]	-0.166*** [-0.201, -0.146]	-9.124*** [-10.457, -8.263]	-0.384*** [-0.427, -0.354]	-9.681*** [-11.112, -8.808]	-0.401*** [-0.452, -0.366]
MA*ESHI*During	$\gamma_{1e}^d$	-3.306*** [-3.884, -2.747]	-0.091*** [-0.113, -0.073]	-5.648*** [-6.442, -4.889]	-0.150*** [-0.178, -0.125]	-5.724*** [-6.568, -5.017]	-0.157*** [-0.186, -0.131]
MA*ESHI	$\gamma_{8e}$	0.562* [-0.027, 1.171]	0 [-0.022, 0.022]	2.128*** [1.249, 2.985]	0.061*** [0.032, 0.093]	2.209*** [1.273, 3.182]	0.068*** [0.037, 0.105]
MA*After	$\gamma_{11e}$	5.119*** [4.372, 5.809]	0.247*** [0.222, 0.272]	9.416*** [8.260, 10.362]	0.440*** [0.406, 0.476]	9.687*** [8.595, 10.748]	0.451*** [0.417, 0.493]
MA*During	$\gamma_{11e}^d$	3.855*** [3.172, 4.473]	0.134*** [0.113, 0.156]	6.232*** [5.440, 6.990]	0.198*** [0.170, 0.227]	6.411*** [5.579, 7.195]	0.209*** [0.179, 0.240]
ESHI*After	$\gamma_{12e}$	-0.068 [-0.668, 0.542]	0.001 [-0.020, 0.028]	-0.028 [-0.744, 0.801]	0.001 [-0.022, 0.032]	-0.054 [-0.820, 0.780]	0.002 [-0.023, 0.038]
ESHI*During	$\gamma_{12e}^d$	-0.009 [-0.357, 0.326]	0.006 [-0.009, 0.019]	-0.108 [-0.534, 0.434]	-0.002 [-0.018, 0.019]	-0.186 [-0.613, 0.396]	-0.003 [-0.020, 0.021]
ESHI	$\gamma_{19e}$	1.171*** [0.824, 1.388]	0.042*** [0.026, 0.052]	1.135*** [0.690, 1.437]	0.038*** [0.019, 0.050]	1.265*** [0.733, 1.630]	0.042*** [0.018, 0.057]
After	$\gamma_{22e}$	0.740*** [0.215, 1.501]	0.041*** [0.022, 0.065]	0.24 [-0.481, 1.097]	0.016 [-0.010, 0.039]	0.145 [-0.517, 1.081]	0.014 [-0.015, 0.038]
During	$\gamma_{22e}^d$	0.588*** [0.249, 1.021]	0.028*** [0.016, 0.042]	0.437* [-0.054, 0.897]	0.023*** [0.003, 0.042]	0.369 [-0.146, 0.856]	0.020** [-0.003, 0.039]
Observations		320,720	320,720	268,488	268,488	251,033	251,033
R-squared		0.77	0.754	0.755	0.738	0.765	0.75

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.

All specifications include individual, state, and state\*large firm fixed effects. Monthly weights used.

Large firm defined as >25 employees.

Table 10: Results from Baseline Specification to Investigate Intensive Margin (Continued)

	(3a) w,L	(3b) Log(w),Log(L)	(3c) w,L	(3d) Log(w),Log(L)	(3e) w,L	(3f) Log(w),Log(L)
Compensating and Hours Differentials, Sufficient Statistics, and Welfare Impact of Health Reform						
	<i>Workers with a paid job and wages&gt;0 in the given period</i>		<i>Workers with a paid job and wages&gt;0 over the entire period</i>		<i>Workers with a paid job and wages&gt;0 and no job switch over the entire period</i>	
$W_D - W_A$	4.308***	0.129***	4.119***	0.125***	4.879***	0.146***
	[3.781, 4.671]	[0.104, 0.145]	[3.376, 4.578]	[0.096, 0.145]	[4.023, 5.398]	[0.113, 0.170]
$W_F - W_B$	0.861**	0.185***	1.640***	0.257***	1.311***	0.277***
	[0.194, 1.293]	[0.137, 0.227]	[0.929, 2.205]	[0.217, 0.290]	[0.450, 1.854]	[0.231, 0.316]
$W_D - W_B$	7.562***	0.600***	10.926***	0.882***	11.459***	0.928***
	[6.232, 8.730]	[0.529, 0.687]	[9.488, 12.057]	[0.807, 0.960]	[9.962, 12.744]	[0.857, 1.014]
$W_F - W_A$	-2.393***	-0.287***	-5.166***	-0.500***	-5.268***	-0.505***
	[-3.535, -1.285]	[-0.346, -0.228]	[-6.356, -4.244]	[-0.565, -0.441]	[-6.447, -4.188]	[-0.564, -0.456]
$L_D - L_A$	1.974***	0.054***	2.025***	0.069***	2.248***	0.079***
	[1.373, 2.419]	[0.032, 0.067]	[1.455, 2.514]	[0.047, 0.084]	[1.657, 2.732]	[0.056, 0.095]
$L_F - L_B$	3.923***	0.141***	6.571***	0.282***	6.124***	0.261***
	[3.344, 4.373]	[0.121, 0.158]	[5.945, 7.032]	[0.260, 0.300]	[5.458, 6.769]	[0.235, 0.285]
$L_D - L_B$	8.569***	0.373***	15.832***	0.716***	15.764***	0.713***
	[7.695, 9.406]	[0.347, 0.402]	[14.537, 16.898]	[0.674, 0.759]	[14.599, 17.023]	[0.671, 0.763]
$L_F - L_A$	-2.672***	-0.178***	-7.236***	-0.366***	-7.392***	-0.374***
	[-3.543, -1.862]	[-0.207, -0.153]	[-8.244, -6.274]	[-0.406, -0.336]	[-8.477, -6.541]	[-0.414, -0.345]
$s$	0.170	0.100	0.170	0.100	0.170	0.100
	-	-	-	-	-	-
$d$	-0.340	-0.200	-0.340	-0.200	-0.340	-0.200
	-	-	-	-	-	-
$\rho$	0.043***	0.440***	0.019***	0.247***	0.018***	0.245***
	[0.031, 0.070]	[0.366, 0.545]	[0.016, 0.022]	[0.221, 0.277]	[0.016, 0.021]	[0.220, 0.270]
$b$	3.302***	0.322***	7.627***	0.573***	7.781***	0.580***
	[2.037, 4.625]	[0.260, 0.388]	[6.459, 9.043]	[0.512, 0.642]	[6.644, 9.070]	[0.526, 0.644]
$\alpha$	-1.203***	-0.383***	-0.495***	-0.206***	-0.578***	-0.238***
	[-1.949, -0.813]	[-0.489, -0.279]	[-0.572, -0.381]	[-0.252, -0.151]	[-0.656, -0.447]	[-0.273, -0.187]
$\lambda - \mu_x$	1.790***	1.217***	1.011***	1.015***	1.093***	1.044***
	[1.463, 2.449]	[1.115, 1.316]	[0.924, 1.089]	[0.962, 1.055]	[0.980, 1.153]	[0.989, 1.078]
$\alpha + \lambda - \mu_x$	0.587***	0.834***	0.516***	0.809***	0.516***	0.807***
	[0.395, 0.699]	[0.803, 0.850]	[0.431, 0.588]	[0.790, 0.821]	[0.421, 0.580]	[0.786, 0.818]
$ESHI_{After}$	0.790	0.790	0.790	0.790	0.790	0.790
	-	-	-	-	-	-
$\frac{b}{\tau}$	1.000	1.000	1.000	1.000	1.000	1.000
	-	-	-	-	-	-
$DWL_m$	1.442***	0.011***	10.553***	0.023***	11.010***	0.024***
	[0.703, 2.532]	[0.010, 0.012]	[7.934, 13.695]	[0.020, 0.027]	[8.622, 14.482]	[0.021, 0.027]
$\frac{DWL_m}{DWL_\tau}$	0.135***	0.062***	0.185***	0.042***	0.185***	0.042***
	[0.072, 0.290]	[0.049, 0.092]	[0.134, 0.256]	[0.036, 0.050]	[0.139, 0.265]	[0.037, 0.050]

results. Unfortunately, our model does not allow us to examine extensive margin decisions directly. Within our model, we cannot redefine  $L$  as an indicator variable for having a paid job, because all individuals with ESHI must have a paid job, so equilibrium  $D$  would always be above equilibrium  $F$ . If we instead aggregate our data, defining  $L$  as the fraction of individuals with a paid job, we cannot take advantage of longitudinal variation.

## 7.6 Implications for National Reform

We have shown that our model applies to both the Massachusetts and national reforms because they share the same key features. The model shows that mandate-based health reform can be more efficient than tax-based health reform, and we find empirical evidence confirming the model for Massachusetts. Using our results from Massachusetts, we can predict the likely impact of national reform, subject to some caveats.

First, although the Massachusetts and national reforms share the same key features, the statutory values of the policy parameters differ. We have already demonstrated that our main result that mandate-based reform is much more efficient than tax-based reform holds if we increase the employer penalty to the statutory level in national reform, increasing labor market distortion. Our result will also be robust to the larger statutory values of the individual penalty in national reform because the individual penalty increases the penalty-and-subsidy-inclusive valuation, decreasing distortion. Subsidies in national reform are somewhat larger and extend to a larger population because incomes are lower outside of Massachusetts and subsidy thresholds are higher under national reform. Larger subsidies increase labor market distortion. Although the extension of our model in Online Appendix OA1 clearly demonstrates the impact of varying subsidy amounts on welfare, we are not able to separately identify behavioral responses to different subsidy amounts because our cell sizes are so small.<sup>17</sup>

A second caveat in applying our results to national reform is that our model has treated a firm's decision to offer health insurance as exogenous. We do not extend the model to incorporate the firm's decision to offer health insurance because we do not observe whether a firm offers health insurance in our data — we only observe ESHI for individuals who have it. To the extent that firms respond differently to national reform than they do to Massachusetts reform, our results might not generalize.

Furthermore, there could be general equilibrium changes to the health insurance markets under national reform that our analysis of the Massachusetts reform does not capture. For example, compliance with the reform in Massachusetts was high, mitigating adverse selection in the market for health insurance outside of employment (see Hackmann et al. (2012) for evidence of adverse selection in Massachusetts). Suppose that compliance with national reform is not as high, leaving higher prices in the market for health insurance outside of employment. In terms of our model, although adverse selection in the non-employer-sponsored market should not affect the cost of

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<sup>17</sup>Rather than relying on our estimates from Massachusetts, we could use our model and exclusively calibrate values to predict the impact of national reform. However, without a separate estimate for  $\alpha$ , this approach requires very strong assumptions.

health insurance to employers  $b$ , it could affect the value of a dollar of ESHI relative to a dollar of wages  $\alpha$  because employees will value ESHI more if their outside health insurance option is more expensive. In that case, more adverse selection in the national non-employer-sponsored market could actually decrease the reform-induced distortion to the labor market relative to what we observed in Massachusetts.

Another issue in applying our results to national reform is that we only consider the welfare impact of health reform through distortions to the labor market. Requiring individuals to purchase health insurance through mandate-based reform or providing it to them directly through a tax-based reform also distorts the market for goods and services by requiring individuals to allocate more dollars to health insurance and fewer dollars to other goods. Our welfare analysis starts from the standpoint that policy makers want to expand coverage to near-universal levels and then examines the efficiency of mandate-based reform and tax-based reform in achieving that policy goal. Because mandate-based reform and tax-based reform would result in the same distortion to the product market, when we compare them, we do not need to take product market distortions into account when we analyze the Massachusetts or national reforms. However, if we choose to examine the welfare-impact of mandate-based reform alone, we need to consider that distortions to the market for goods and services create an additional welfare loss. Because Massachusetts started with a higher level of coverage than the rest of the nation, distortions to the market for goods and services could be larger under national reform than they were under the Massachusetts reform. Furthermore, the individual penalty under Massachusetts reform is smaller than the individual penalty under national reform. We have shown that the distortion to the labor market should be greater under the smaller Massachusetts individual penalty; however, the larger national individual penalty could increase distortion to the market for goods and services by providing a larger incentive for individuals to substitute health insurance for other goods.

Finally, in comparing mandate-based health reform to tax-based health reform, we have assumed that mandate-based policy makes the linkage between taxes and benefits more salient — workers can recognize the link between ESHI and wages under mandate-based health reform, but they do not recognize the link between tax-financed health insurance and wages under tax-based reform. In this light, our theory demonstrates that if individuals recognize the linkage between the taxes they pay and the benefits that they receive, and if they value those benefits, then the labor market distortion is smaller than it would be otherwise. Our theory can be applied in a variety of other contexts in which the salience of the linkage between costs and benefits varies. Our results from health reform in Massachusetts suggest that individuals did recognize the linkage between wages and health insurance and that they placed some value on the health insurance that they received. If individuals outside of Massachusetts place a larger value on health insurance, the labor market distortion could be smaller under national reform than it was under the Massachusetts reform.

## 8 Conclusion

The recent Massachusetts and national health reforms are the most profound changes to health policy in the United States since the introduction of Medicare and Medicaid in 1965. Since employers sponsor the majority of health insurance coverage for the non-elderly in the United States, changes to health policy can affect the labor market profoundly. To study the relationship between health reform and the labor market, we develop a model that incorporates the three key elements of mandate-based health reform: employer and individual pay-or-play mandates and expansions in subsidized coverage. Using our model, we characterize the compensating differential for ESHI. We also characterize the welfare impact of the labor market distortion induced by health reform in terms of a small number of sufficient statistics that can be recovered from labor market outcomes. Our model accounts for the complex set of underlying preferences for insurance, capturing them simply as the willingness to trade off monetary wages for employer-sponsored health insurance coverage. Using variation from the Massachusetts reform — which includes the same mandate-based reform elements as the national reform, we estimate our model using longitudinal data from the Survey of Income and Program Participation.

We find evidence of a substantial compensating differential for ESHI: full-time workers that gained coverage due to the Massachusetts reform earned wages that were lower than they would have been had they not gained ESHI by \$6,055 per year, nearly the entire average cost of their health insurance to their employers. Our finding stands in stark contrast to the results from the extensive literature that searches for a compensating differential for ESHI but does not find one. Because of difficulties with identification, studies generally find that individuals with ESHI have *higher* wages than those without. A small number of studies do find evidence in favor of a compensating differential, showing that wages for workers with ESHI decrease as health insurance costs increase. However, these studies use variation in *incremental changes* in the cost of health insurance. We identify the compensating differential using variation in the *entire* cost of health insurance using reform-induced exogenous transitions into and out of ESHI.

Building on our estimated compensating differential, we estimate the welfare impact of the labor market distortion induced by health reform. Our large estimated compensating differential indicates that individuals who gained ESHI were willing to accept lower wages because they valued the coverage that they received. We estimate that individuals who gained coverage through their employers valued approximately 76 cents of every dollar that their employers spent on their coverage. Because individuals valued ESHI, mandate-based health reform in Massachusetts resulted in significantly less distortion to the labor market than it would have otherwise. We estimate that if the government had instead increased insurance coverage by establishing a wage tax to pay for health insurance, the distortion to the labor market would have been more than 20 times as large. Our results suggest that mandate-based reform has the potential to be a very efficient approach for expanding health insurance coverage nationally.

## A Appendix: Massachusetts and National Reform Comparison

Table A1: Summary of Labor Market Provisions in Massachusetts and National Reforms

	<b>Massachusetts Health Care Reform, April 2006</b>	<b>Patient Protection and Affordable Care Act (PPACA), March 2010</b>
“Large” Employer	At least 11 employees <sup>1,2</sup>	At least 50 full-time employees <sup>3</sup>
Provisions Affecting Large Employers	<p>Must either:</p> <ul style="list-style-type: none"> <li>Offer employees the option to purchase health coverage,<sup>5</sup> OR</li> <li>Pay an annual penalty per employee<sup>1</sup></li> </ul> <p>In addition, employers:</p> <ul style="list-style-type: none"> <li>Must offer the option to pay the premium using pre-tax wages<sup>5</sup></li> <li>Are not required to contribute towards the premium (but may pay penalties if they do not)<sup>5</sup></li> </ul>	<p>Must either:</p> <ul style="list-style-type: none"> <li>Offer employees affordable health coverage options,<sup>4</sup> OR</li> <li>Pay an annual penalty per employee<sup>3</sup></li> </ul> <p>Affordable coverage defined as:</p> <ul style="list-style-type: none"> <li>Insurance coverage at least 60% of covered expenses,<sup>3</sup> AND</li> <li>Employees not required to pay more than 9.5% of family income for coverage<sup>3,4</sup></li> </ul>
“Small” Employer	Fewer than 11 employees	Fewer than 50 employees
Provisions Affecting Small Employers	<p>May purchase coverage for employees via the Commonwealth Health Insurance Connector, which:<sup>1</sup></p> <ul style="list-style-type: none"> <li>Offers access to health insurance options approved by a State board</li> <li>Merges the individual and small business insurance markets</li> </ul>	<p>Very small businesses (fewer than 25 employees) may:</p> <ul style="list-style-type: none"> <li>Be eligible for a tax credit for offering health insurance if average wages are under \$50,000<sup>3,4</sup></li> </ul>
Penalties (Large Employers)	<p>Must pay a penalty of \$295 per employee per year, if:</p> <ul style="list-style-type: none"> <li>The employer does not offer health insurance options,<sup>1</sup> OR</li> <li>The employer contributes less than 33% of the premium<sup>2</sup></li> </ul> <p>Must also pay a penalty if employees use the uncompensated care pool<sup>2</sup></p>	<p>Two types of penalties:</p> <ul style="list-style-type: none"> <li>Must pay \$2,000 per full-time employee for not offering <b>any</b> insurance options<sup>3,4</sup></li> <li>Must pay \$3,000 (up to a maximum) for not offering affordable coverage, for all employees receiving a tax credit for insurance purchased on exchange<sup>3,4</sup></li> </ul> <p>Penalties increase annually for premium growth. Not assessed for first 30 employees<sup>3,4</sup></p>
Provisions Affecting Individuals	<p>Individuals are required either to:</p> <ul style="list-style-type: none"> <li>Buy creditable health insurance,<sup>1,7</sup> OR</li> <li>Pay a penalty, if the cost of coverage has been deemed affordable<sup>6,7</sup></li> </ul> <p>Individuals with incomes below 300% of poverty can access subsidized health insurance:<sup>7</sup></p> <ul style="list-style-type: none"> <li>&lt;150% of poverty pay no premium<sup>1</sup></li> <li>151-200% pay \$35 per month<sup>1</sup></li> <li>Up to 300% receive subsidies</li> </ul>	<p>Individuals are required either to:</p> <ul style="list-style-type: none"> <li>Purchase “qualifying” health coverage,<sup>8</sup> OR</li> <li>Pay a penalty, with some exemptions available<sup>8</sup></li> </ul> <p>Provides subsidies/access to coverage for low-income individuals:</p> <ul style="list-style-type: none"> <li>&lt;133% of poverty become eligible for Medicaid coverage, effectively 138% after deducting 5% of poverty<sup>8,9</sup></li> <li>Up to 400% receive premium/cost-sharing credits towards purchase via the exchanges. Credits increase with income, limiting contributions from 2% to 9.5% of income<sup>8</sup></li> </ul>
Penalties (Individuals)	<p>Individuals who do not purchase affordable coverage, but are in income brackets with affordable coverage available, face penalties:<sup>7</sup></p> <ul style="list-style-type: none"> <li>Initially, \$219 per individual</li> <li>Starting in 2008, up to 50% of the cost of the least expensive coverage</li> </ul>	<p>Individuals not purchasing coverage face a penalty of the greater of:</p> <ul style="list-style-type: none"> <li>\$695 (annually) to a maximum of three times this amount,<sup>8</sup> OR</li> <li>2.5% of household income<sup>8</sup></li> </ul> <p>These amounts phased in beginning in 2014<sup>8</sup></p>

Notes: [1] Kaiser Family Foundation (2007), [2] Felland et al (2007), [3] Kaiser Family Foundation (2010d), [4] Anonymous (2011), [5] Commonwealth Connector (2007), [6] Kaiser Family Foundation (2009), [7] Raymond (2007), [7] Kaiser Family Foundation (2010b), [8] Kaiser Family Foundation (2010c).

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## OA1 Online Appendix: Variation in Subsidy Amounts

We can extend our model to incorporate variation in the health insurance subsidy amounts that Massachusetts and ACA extend to subsets of the population. Thus far, we have modeled these subsidies as a share of the total cost of health insurance,  $\mu_x$ , that is paid by the government. The subscript  $x$  indexes the magnitude of the subsidy, which varies based on income. Here, we specify three different income categories as values of  $x$ :  $I$  for the income category that is not eligible for any subsidies,  $II$  for the income category that is eligible for partial subsidies, and  $III$  for the income category that is eligible for full subsidies. Before reform, some individuals receive subsidies  $\mu_{III}$ . After reform, some individuals receive fully subsidized coverage, and others with higher incomes receive partial subsidies  $\mu_{II}$ . Individuals in the highest income categories do not qualify for any subsidies; therefore,  $\mu_I = 0$ .

As in the case of the individual mandate, the subsidies only affect an individual's labor supply if he *does* obtain health insurance through his employer. In the face of a penalty, he is *more* willing to work for health benefits instead of wages. However, if he is eligible for a subsidy for health insurance outside of employment, he is *less* willing to work for employer health insurance benefits instead of wages.<sup>1</sup>

Figure OA1: Graphical Model with Variation in Subsidy Amounts

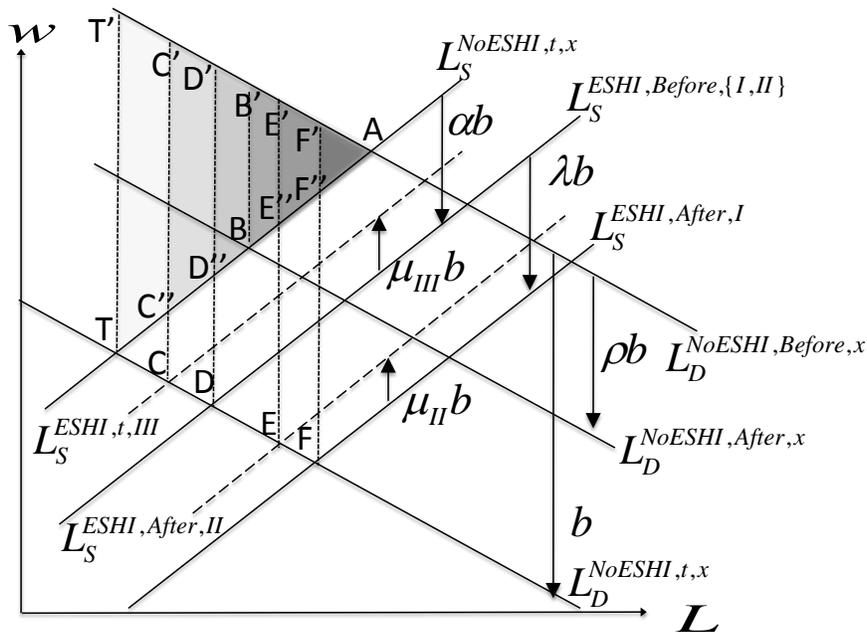


Figure OA1 shows the graphical model that incorporates variation in the subsidy amounts. Individuals who are eligible for a full subsidy but forgo it for ESHI before the reform have wages and hours given by  $C$ . They remain at  $C$  after the reform because the individual penalty does not

<sup>1</sup>This discussion assumes that health insurance does not affect an individual's ability to work. To the extent that it does, we could introduce separate  $L_S^{NoESHI}$  curves for individuals with and without any health insurance. We are unlikely to have enough variation to separate these two curves in our empirical implementation.

apply to them. Individuals who become eligible for a partial subsidy but forgo it for ESHI after the reform have wages and hours given by point  $E$ . Individuals with ESHI who are not eligible for any subsidies after the reform have wages and hours given by point  $F$ . The other equilibria are unchanged from the original model.

Figure OA1 incorporates the universe of equilibria under mandate-based health reform with three separate subsidy eligibility categories. There are six possible labor market equilibria ( $A$  through  $F$ ) depicted, which depend on ESHI status and the values of the parameters. However, for any given individual, there are only four possible equilibria - equilibria with and without ESHI before and after reform. The first two columns of Table OA1 list the four relevant equilibria for each category of subsidy eligibility.

Table OA1: Wages in Terms of Coefficients by Subsidy Amounts

I: 300 FPL+		
$w_{AI}$	noeshi, before	0
$w_{BI}$	noeshi, after	$\beta_{11}$
$w_{DI}$	eshi, before	$\beta_8 [+ \beta_{8e}]$
$w_{FI}$	eshi, after	$\beta_1 + \beta_8 + \beta_{11} [+ \beta_{1e} + \beta_{8e}]$
II: 150 to 300 FPL		
$w_{AII}$	noeshi, before	0
$w_{BII}$	noeshi, after	$\beta_7 + \beta_{11}$
$w_{DII}$	eshi, before	$\beta_5 + \beta_8 [+ \beta_{5e} + \beta_{8e}]$
$w_{EII}$	eshi, after	$\beta_1 + \beta_3 + \beta_5 + \beta_7 + \beta_8 + \beta_{11} [+ \beta_{1e} + \beta_{3e} + \beta_{5e} + \beta_{8e}]$
III: <150 FPL		
$w_{AIII}$	noeshi, before	0
$w_{BIII}$	noeshi, after	$\beta_6 + \beta_{11}$
$w_{CIII}$	eshi, before	$\beta_4 + \beta_8 [+ \beta_{4e} + \beta_{8e}]$
$w_{EIII}$	eshi, after	$\beta_1 + \beta_2 + \beta_4 + \beta_6 + \beta_8 + \beta_{11} [+ \beta_{1e} + \beta_{2e} + \beta_{4e} + \beta_{8e}]$

### OA1.1 Identification

For identification of the additional parameters, we incorporate variation across subsidy eligibility categories. Table OA2 presents all of the sufficient statistics in terms of differences between equilibria. Within each subsidy eligibility category, we can estimate all possible sufficient statistics from the original model. For example, we can derive the slope of the supply curve within each of the three eligibility categories, resulting in sufficient statistics  $s_I$ ,  $s_{II}$ , and  $s_{III}$ , as shown in the first three rows of the table. As drawn, our graphical model assumes that the slopes of the labor supply curves are the same within each category. We can test the assumption by allowing the slopes to vary within each eligibility category. We can identify all sufficient statistics identified by the main

model, discussed in Section 4 of the paper, using the same variation in the extended model.

Table OA2: Sufficient Statistics in Terms of Differences between Equilibria by Subsidy Amounts

Sufficient statistic	Expression in wages and employment
$s_I$	$\frac{w_{BI}-w_{AI}}{L_{BI}-L_{AI}}$
$s_{II}$	$\frac{w_{BII}-w_{AII}}{L_{BII}-L_{AII}}$
$s_{III}$	$\frac{w_{BIII}-w_{AIII}}{L_{BIII}-L_{AIII}}$
$d_I$	$\frac{w_{FI}-w_{DI}}{L_{FI}-L_{DI}}$
$d_{II}$	$\frac{w_{EII}-w_{DII}}{L_{EII}-L_{DII}}$
$d_{III}$	$\frac{w_{CIII}-w_{DIII}}{L_{CIII}-L_{DIII}}$
$\rho_I$	$\frac{d_I(L_{BI}-L_{AI})-(w_{BI}-w_{AI})}{b}$
$\rho_{II}$	$\frac{d_{II}(L_{BII}-L_{AII})-(w_{BII}-w_{AII})}{b_{II}}$
$\rho_{III}$	$\frac{d_{III}(L_{BIII}-L_{AIII})-(w_{BIII}-w_{AIII})}{b_{III}}$
$b_I$	$d_I(L_{FI} - L_{AI}) - (w_{FI} - w_{AI})$
$b_{II}$	$d_{II}(L_{EII} - L_{AII}) - (w_{EII} - w_{AII})$
$b_{III}$	$d_{III}(L_{CIII} - L_{AIII}) - (w_{CIII} - w_{AIII})$
$\alpha_I$	$\frac{s(L_{DI}-L_{AI})-(w_{DI}-w_{AI})}{b_I}$
$\alpha_{II}$	$\frac{s_{II}(L_{DII}-L_{AII})-(w_{DII}-w_{AII})}{b_{II}}$
$\lambda_I$	$\frac{s(L_{FI}-L_{DI})-(w_{FI}-w_{DI})}{b_I}$
$\alpha_I + \lambda_I$	$\frac{s(L_{FI}-L_{AI})-(w_{FI}-w_{AI})}{b_I}$
$\alpha_{II} + \lambda_I - \mu_{II}$	$\frac{s_{II}(L_{EII}-L_{AII})-(w_{EII}-w_{AII})}{b_{II}}$
$\alpha_I - \mu_{III}$	$\frac{s_{III}(L_{CIII}-L_{AIII})-(w_{CIII}-w_{AIII})}{b_{III}}$
$\mu_{III}$	$\alpha_I - \frac{s_{III}(L_{CIII}-L_{AIII})-(w_{CIII}-w_{AIII})}{b_{III}}$
$\mu_{II}$	$\alpha_{II} + \lambda_I - \frac{s_{II}(L_{EII}-L_{AII})-(w_{EII}-w_{AII})}{b_{II}}$

In addition, we can separately identify the subsidy parameters from the other parameters by comparing across categories. For example, to identify  $\mu_{III}$ , we first identify  $\alpha - \mu_{III}$  by comparing individuals who are eligible for full subsidies who move from not having ESHI before the reform (equilibrium A) to having ESHI after the reform (equilibrium C). Next, we net this sum out of the value of  $\alpha$  obtained from the category that is not eligible for any subsidies. We identify  $\mu_{II}$  with a similar comparison across categories. We do note, however, that separate identification of each  $\mu_x$  requires the assumption that  $\alpha$  does not vary by subsidy eligibility group. Were we to relax that assumption, as we do in the pooled estimation in Section 7.4, we cannot separately identify subsidy effects from differences in the underlying valuation.

## OA1.2 Estimation

To estimate all of the relevant parameters of our model, we specify and estimate wage and hours equations of the following form:

$$Y_{it} = [\beta_1 MA * ESHI * After * Large + \beta_2 MA * ESHI * 1(< 150FPL) * After * Large +$$

$$\begin{aligned}
& \beta_3 MA * ESHI * 1(150to300FPL) * After * Large + \beta_4 MA * ESHI * 1(< 150FPL) * Large + \\
& \beta_5 MA * ESHI * 1(150to300FPL) * Large + \beta_6 MA * 1(< 150FPL) * After * Large + \\
& \beta_7 MA * 1(150to300FPL) * After * Large + \beta_8 MA * ESHI * Large + \\
& \beta_9 MA * 1(< 150FPL) * Large + \beta_{10} MA * 1(150to300FPL) * Large + \\
& \beta_{11} MA * After * Large + \beta_{12} ESHI * After * Large + \\
& \beta_{13} ESHI * 1(< 150FPL) * After * Large + \beta_{14} ESHI * 1(150to300FPL) * After * Large + \\
& \beta_{15} ESHI * 1(< 150FPL) * Large + \beta_{16} ESHI * 1(150to300FPL) * Large + \\
& \beta_{17} 1(< 150FPL) * After * Large + \beta_{18} 1(150to300FPL) * After * Large + \\
& \beta_{19} ESHI * Large + \beta_{20} 1(< 150FPL) * Large + \beta_{21} 1(150to300FPL) * Large + \beta_{22} After * Large + \\
& \beta_{23} large + \phi_g * Large + ] \\
& \beta_{1[e]} MA * ESHI * After + \beta_{2[e]} MA * ESHI * 1(< 150FPL) * After + \\
& \beta_{3[e]} MA * ESHI * 1(150to300FPL) * After + \beta_{4[e]} MA * ESHI * 1(< 150FPL) + \\
& \beta_{5[e]} MA * ESHI * 1(150to300FPL) + \beta_{6[e]} MA * 1(< 150FPL) * After + \\
& \beta_{7[e]} MA * 1(150to300FPL) * After + \beta_{8[e]} MA * ESHI + \\
& \beta_{9[e]} MA * 1(< 150FPL) + \beta_{10[e]} MA * 1(150to300FPL) + \\
& \beta_{11[e]} MA * After + \beta_{12[e]} ESHI * After + \\
& \beta_{13[e]} ESHI * 1(< 150FPL) * After + \beta_{14[e]} ESHI * 1(150to300FPL) * After + \\
& \beta_{15[e]} ESHI * 1(< 150FPL) + \beta_{16[e]} ESHI * 1(150to300FPL) + \\
& \beta_{17[e]} 1(< 150FPL) * After + \beta_{18[e]} 1(150to300FPL) * After + \\
& \beta_{19[e]} ESHI + \{\beta_{20[e]} 1(< 150FPL)\} + \{\beta_{21[e]} 1(150to300FPL)\} + \beta_{22[e]} After + \\
& \phi_g + \delta_i + \varepsilon_{it}
\end{aligned}$$

where all of the terms are as defined in the main estimating equation, which is a special case of this equation. Because our data do not include information on subsidy eligibility, we proxy for subsidy eligibility with income categories. We assume that people above 300% of the federal poverty line (FPL) are not eligible for any subsidies before or after reform. People between 150 and 300% of FPL are eligible for partial subsidies after the reform, and we represent them with the indicator  $1(150to300FPL)$ . People under 150% of FPL are eligible for full subsidies before and after the reform, and we represent them with the indicator  $1(< 150FPL)$ . We classify individuals into income groups using the first period of available data to avoid regressing wages on contemporaneous measures of income. Therefore,  $\beta_{20e}$  and  $\beta_{21e}$  are shown in  $\{\}$  and omitted because they are collinear with the individual fixed effects. From the estimated coefficients, we can derive each of the sufficient statistics as shown in Table OA3.

Table OA3: Sufficient Statistics in Terms of Coefficients by Subsidy Amounts

Sufficient statistic	Expression in coefficients
$s_I$	$\frac{\beta_{11}}{\gamma_{11}}$
$s_{II}$	$\frac{\beta_7 + \beta_{11}}{\gamma_7 + \gamma_{11}}$
$s_{III}$	$\frac{\beta_6 + \beta_{11}}{\gamma_6 + \gamma_{11}}$
$d_I$	$\frac{\beta_1 + \beta_{11} + \beta_{1e}}{\gamma_1 + \gamma_{11} + \gamma_{1e}}$
$d_{II}$	$\frac{\beta_1 + \beta_3 + \beta_7 + \beta_{11} + \beta_{1e} + \beta_{3e}}{\gamma_1 + \gamma_3 + \gamma_7 + \gamma_{11} + \gamma_{1e} + \gamma_{3e}}$
$d_{III}$	$\frac{\beta_1 + \beta_2 + \beta_6 + \beta_{11} + \beta_{1e} + \beta_{2e}}{\gamma_1 + \gamma_2 + \gamma_6 + \gamma_{11} + \gamma_{1e} + \gamma_{2e}}$
$\rho_I$	$\frac{b_I}{d_I(\gamma_{11}) - (\beta_{11})}$
$\rho_{II}$	$\frac{d_{II}(\gamma_7 + \gamma_{11}) - (\beta_7 + \beta_{11})}{b_{II}}$
$\rho_{III}$	$\frac{d_{III}(\gamma_6 + \gamma_{11}) - (\beta_6 + \beta_{11})}{b_{III}}$
$b_I$	$d_I(\gamma_1 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{8e}) - (\beta_1 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{8e})$
$b_{II}$	$d_{II}(\gamma_1 + \gamma_3 + \gamma_5 + \gamma_7 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{3e} + \gamma_{5e} + \gamma_{7e} + \gamma_{8e}) - (\beta_1 + \beta_3 + \beta_5 + \beta_7 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{3e} + \beta_{5e} + \beta_{7e} + \beta_{8e})$
$b_{III}$	$d_{III}(\gamma_1 + \gamma_2 + \gamma_4 + \gamma_6 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{2e} + \gamma_{4e} + \gamma_{8e}) - (\beta_1 + \beta_2 + \beta_4 + \beta_6 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{2e} + \beta_{4e} + \beta_{8e})$
$\alpha_I$	$\frac{b_I}{s_I(\gamma_8 + \gamma_{8e}) - (\beta_8 + \beta_{8e})}$
$\alpha_{II}$	$\frac{b_{II}}{s_{II}(\gamma_5 + \gamma_8 + \gamma_{5e} + \gamma_{8e}) - (\beta_5 + \beta_8 + \beta_{5e} + \beta_{8e})}$
$\lambda_I$	$\frac{b_{II}}{s_I(\gamma_1 + \gamma_{11} + \gamma_{1e}) - (\beta_1 + \beta_{11} + \beta_{1e})}$
$\alpha_I + \lambda_I$	$\frac{b_I}{s_I(\gamma_1 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{8e}) - (\beta_1 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{8e})}$
$\alpha_{II} + \lambda_I - \mu_{II}$	$\frac{b_I}{s_{II}(\gamma_1 + \gamma_3 + \gamma_5 + \gamma_7 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{3e} + \gamma_{5e} + \gamma_{7e} + \gamma_{8e}) - (\beta_1 + \beta_3 + \beta_5 + \beta_7 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{3e} + \beta_{5e} + \beta_{7e} + \beta_{8e})}$
$\alpha_I - \mu_{III}$	$\frac{b_{II}}{s_{III}(\gamma_1 + \gamma_2 + \gamma_4 + \gamma_6 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{2e} + \gamma_{4e} + \gamma_{8e}) - (\beta_1 + \beta_2 + \beta_4 + \beta_6 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{2e} + \beta_{4e} + \beta_{8e})}$
$\mu_{III}$	$\alpha_I - \frac{b_{III}}{s_{III}(\gamma_1 + \gamma_2 + \gamma_4 + \gamma_6 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{2e} + \gamma_{4e} + \gamma_{8e}) - (\beta_1 + \beta_2 + \beta_4 + \beta_6 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{2e} + \beta_{4e} + \beta_{8e})}$
$\mu_{II}$	$\alpha_{II} + \lambda_I - \frac{b_{II}}{s_{II}(\gamma_1 + \gamma_3 + \gamma_5 + \gamma_7 + \gamma_8 + \gamma_{11} + \gamma_{1e} + \gamma_{3e} + \gamma_{5e} + \gamma_{7e} + \gamma_{8e}) - (\beta_1 + \beta_3 + \beta_5 + \beta_7 + \beta_8 + \beta_{11} + \beta_{1e} + \beta_{3e} + \beta_{5e} + \beta_{7e} + \beta_{8e})}$

### OA1.3 Results

We present results from the preferred specification with firm size interaction terms in Table OA4. Following our main approach, we calibrate  $s$  and  $d$  in each category. We also calibrate  $\rho$  as above in computing our measures of deadweight loss. Our estimates are very noisy, illustrating the advantage of pooling all income categories in our main specifications. Despite the noise, some patterns emerge.

Combining the compensating and hours differential estimates with calibrated labor supply and demand slopes yields estimates for  $b$  that are correctly signed. Our estimates for  $b_I$  and  $b_{III}$  are \$1.13 and \$2.50 per hour, respectively. The estimate for  $b_{II}$ , however, is \$15.55. This does not accord well with the cost of ESHI. This is a first indication that estimated effects for this group likely reflect the relatively small sample size for individuals between 150% of FPL and 300% of FPL in Massachusetts in the SIPP. Because the SIPP over samples among the poor, sample size is not a problem for the population who qualify for full subsidies,  $\mu_{III}$ . We also have sufficient observations for income category  $I$ , given the large share of the population earning more than 300% of FPL.

Translating our estimates for the compensating and hours differentials into penalty-and-subsidy-inclusive valuations, we find relatively high estimates for all groups. To maintain internal consistency by group, the penalty-and-subsidy-inclusive valuation for each group is taken relative to the estimated cost of  $b$  for that group. All of the estimates are of a reasonable magnitude, though we note that only  $\alpha_I - \mu_{III}$  and  $\alpha_I + \lambda_I$  are significantly different from zero. The estimates suggest a relatively high penalty-and-subsidy-inclusive valuation across subsidy levels. In fact, the estimate of  $\alpha_I + \lambda_I$  is not significantly different from 1. These findings suggest that the behavioral response to qualifying for a subsidy is not a strong driver of reduced valuation for ESHI. However, given the noisy estimates, particularly for those who qualify for partial subsidies, we do not emphasize the precision of this conclusion.

Turning to our separate estimates for each of the  $\mu_x$  terms, which are not identified as convincingly, we do not find compelling estimates. Our estimate for  $\mu_{III}$ , corresponding to a full subsidy, is -2.56. This estimate is both of the wrong sign and far larger than we would predict given that it is measured as a share of the cost of the benefit,  $b$ . The estimate for  $\mu_{II}$  has the expected sign but is also larger than we would expect, given that  $\mu_{II}$  is only a partial subsidy.

As in our earlier estimates, we are still able to compute aggregate measures for the cost of ESHI and the penalty-and-subsidy-inclusive valuation, even if the separate parameters are not measured well. Therefore, we can still compute the deadweight loss of mandated-based reform for each of the groups who qualify for different subsidies. Our estimates for the deadweight loss associated with mandate-based reform for group  $I$  and  $III$  are substantially smaller than our estimates in the aggregate population. The estimated deadweight loss of mandate-based reform for the partial subsidy group, on the other hand, is much larger. We find that the annual deadweight loss of mandate-based reform ( $DWL_m$ ) for individuals eligible for no, partial, and full subsidies is \$0.57, \$355 and \$0.26, respectively. We are also able to compute the relative deadweight loss of mandate-based reform compared to tax-based reform for each of the subsidy eligible groups. The estimated deadweight loss of mandate-based reform is 1%, 3.2%, and 0.1% of tax based reform for groups

*I*, *II*, and *III*, respectively. These findings suggest that our main deadweight loss findings are broadly robust to subgroup specific estimates, though we note that group *II* in particular seems to have very noisy estimates.

Taken together, these results, which allow for different responses for individuals who qualify for different subsidies, are consistent with our main findings. Because these specifications allow us to identify additional parameters, specifically the magnitude of the behavioral response to qualifying for subsidized health insurance outside of an employer, we could use these estimates as our main specification. However, we do not emphasize these results because we lose a considerable amount of power when we further divide the SIPP data into income categories.

Table OA4: Results from Preferred Specification by Subsidy Amounts

		(1) w Weekly earnings / baseline hours per week, including individuals without a paid job (wage=0)		(2) L Hours per week, including individuals without a paid job (hours=0)		(3) Compensating and Hours Differentials, Sufficient Statistics, and Welfare Impact of Health Reform
MA*ESHI*After*Large	$\beta_1$	0.319 [-1.240, 2.473]	$\gamma_1$	0.791 [-0.741, 2.332]	$W_{DI} - W_{AI}$	1.833*** [1.284, 2.364]
MA*ESHI*During*Large	$\beta_1^d$	-2.634*** [-5.101, -0.476]	$\gamma_1^d$	-3.331*** [-4.519, -2.401]	$W_{FI} - W_{BI}$	0.038 [-0.393, 0.660]
MA*ESHI*After*<150FPL*Large	$\beta_2$	0.004 [-4.147, 3.812]	$\gamma_2$	-0.137 [-8.886, 5.032]	$W_{DI} - W_{BI}$	2.914*** [1.502, 4.224]
MA*ESHI*During*<150FPL*Large	$\beta_2^d$	-1.631 [-5.409, 2.305]	$\gamma_2^d$	6.712* [-0.484, 10.780]	$W_{FI} - W_{AI}$	-1.043 [-2.667, 0.502]
MA*ESHI*After*150-300FPL*Large	$\beta_3$	-1.283 [-4.240, 1.536]	$\gamma_3$	-5.674*** [-8.395, -2.025]	$W_{DII} - W_{AII}$	0.586 [-0.418, 1.026]
MA*ESHI*During*150-300FPL*Large	$\beta_3^d$	1.959* [-0.380, 5.219]	$\gamma_3^d$	11.535*** [9.449, 14.496]	$W_{EII} - W_{BII}$	0.158 [-0.855, 0.724]
MA*ESHI*<150FPL*Large	$\beta_4$	-2.299* [-3.716, 0.017]	$\gamma_4$	-7.338*** [-10.044, -5.159]	$W_{DII} - W_{BII}$	0.926 [-0.583, 1.878]
MA*ESHI*150-300FPL*Large	$\beta_5$	0.223 [-1.039, 1.761]	$\gamma_5$	-1.645 [-3.134, 0.339]	$W_{EII} - W_{AII}$	-0.183 [-1.564, 0.819]
MA*After*<150FPL*Large	$\beta_6$	3.343*** [1.198, 5.323]	$\gamma_6$	-0.241 [-3.143, 1.760]	$W_{CIII} - W_{AIII}$	6.730*** [6.226, 7.250]
MA*During*<150FPL*Large	$\beta_6^d$	-0.383 [-2.731, 1.224]	$\gamma_6^d$	0.041 [-2.165, 1.562]	$W_{CIII} - W_{BIII}$	-1.148** [-2.248, -0.063]
MA*After*150-300FPL*Large	$\beta_7$	-11.225*** [-13.575, -9.242]	$\gamma_7$	-8.704*** [-10.712, -6.781]	$W_{CIII} - W_{BIII}$	19.036*** [17.787, 20.959]
MA*During*150-300FPL*Large	$\beta_7^d$	-10.503*** [-13.720, -8.552]	$\gamma_7^d$	-13.655*** [-16.176, -11.613]	$W_{CIII} - W_{AIII}$	-13.455*** [-15.789, -11.673]
MA*ESHI*Large	$\beta_8$	2.181*** [1.068, 3.178]	$\gamma_8$	0.942* [-0.062, 1.679]	$L_{DI} - L_{AI}$	1.497** [0.264, 2.117]
MA*<150FPL*Large	$\beta_9$	3.697*** [2.370, 4.853]	$\gamma_9$	9.528*** [7.955, 11.906]	$L_{FI} - L_{BI}$	3.538*** [2.080, 5.663]
MA*150-300FPL*Large	$\beta_{10}$	5.135*** [3.749, 6.220]	$\gamma_{10}$	1.468 [-0.460, 3.202]	$L_{DI} - L_{BI}$	10.542*** [8.245, 12.428]
MA*After*Large	$\beta_{11}$	-1.081 [-2.533, 0.224]	$\gamma_{11}$	-0.341 [-1.632, 0.989]	$L_{FI} - L_{AI}$	-5.506*** [-7.277, -3.456]
MA*During*Large	$\beta_{11}^d$	3.457*** [1.764, 6.129]	$\gamma_{11}^d$	3.006*** [2.227, 3.979]	$L_{DII} - L_{AII}$	-0.773*** [-2.019, -0.280]
ESHI*After*Large	$\beta_{12}$	0.075 [-1.598, 1.578]	$\gamma_{12}$	-0.322 [-1.464, 0.890]	$L_{EII} - L_{BII}$	-4.791*** [-7.264, -2.714]
ESHI*During*Large	$\beta_{12}^d$	1.292 [-0.492, 3.531]	$\gamma_{12}^d$	-0.205 [-0.901, 0.575]	$L_{DII} - L_{BII}$	-3.034*** [-4.580, -1.749]
ESHI*After*<150FPL*Large	$\beta_{13}$	0.44 [-2.742, 2.901]	$\gamma_{13}$	-0.081 [-4.494, 2.925]	$L_{EII} - L_{AII}$	-2.529*** [-5.755, -0.667]
ESHI*During*<150FPL*Large	$\beta_{13}^d$	-3.494*** [-6.670, -1.257]	$\gamma_{13}^d$	-2.068 [-5.128, 0.334]	$L_{CIII} - L_{AIII}$	2.344*** [0.718, 3.615]
ESHI*After*150-300FPL*Large	$\beta_{14}$	0.647 [-2.074, 3.324]	$\gamma_{14}$	-0.272 [-2.635, 2.219]	$L_{CIII} - L_{BIII}$	0.656 [-5.671, 3.140]
ESHI*During*150-300FPL*Large	$\beta_{14}^d$	-1.539 [-3.869, 0.606]	$\gamma_{14}^d$	-1.192* [-2.775, 0.180]	$L_{CIII} - L_{BIII}$	2.926*** [0.809, 5.546]
ESHI*<150FPL*Large	$\beta_{15}$	-0.379 [-2.002, 0.847]	$\gamma_{15}$	0.966 [-0.514, 2.520]	$L_{CIII} - L_{AIII}$	0.074 [-7.029, 2.207]
ESHI*150-300FPL*Large	$\beta_{16}$	0.526 [-0.773, 1.954]	$\gamma_{16}$	-0.042 [-1.676, 1.437]	$s$	0.19 -
After*<150FPL*Large	$\beta_{17}$	-0.628 [-2.365, 1.555]	$\gamma_{17}$	1.452* [-0.242, 3.733]	$d$	-0.38 -
During*<150FPL*Large	$\beta_{17}^d$	1.287** [0.035, 3.449]	$\gamma_{17}^d$	1.214* [-0.133, 2.676]	$\rho_I$	0.127 [-1.389, 1.334]
After*150-300FPL*Large	$\beta_{18}$	-0.987 [-2.803, 1.223]	$\gamma_{18}$	-0.12 [-1.764, 1.451]	$\rho_{II}$	0.009*** [0.008, 0.011]
During*150-300FPL*Large	$\beta_{18}^d$	0.465 [-1.165, 2.517]	$\gamma_{18}^d$	0.422 [-0.753, 1.453]	$\rho_{III}$	0.057** [0.016, 0.235]
ESHI*Large	$\beta_{19}$	2.232*** [1.235, 3.007]	$\gamma_{19}$	6.714*** [6.065, 7.400]	$b_I$	1.113 [-0.484, 3.032]
Large*<150FPL	$\beta_{20}$	1.154*** [0.382, 2.172]	$\gamma_{20}$	-2.732*** [-3.746, -1.601]	$b_{II}$	15.547*** [13.444, 18.161]
Large*150-300FPL	$\beta_{21}$	-0.183 [-1.280, 0.887]	$\gamma_{21}$	0.482 [-0.902, 2.302]	$b_{III}$	2.501** [0.096, 7.976]
After*Large	$\beta_{22}$	-0.476 [-1.801, 0.644]	$\gamma_{22}$	-0.493 [-1.767, 0.469]	$\alpha_I$	-1.547 [-15.454, 17.748]

Table OA4: Results from Preferred Specification by Subsidy Amounts (Continued)

During*Large	$\beta_{22}^d$	-1.152 [-3.515, 0.219]	$\gamma_{22}^d$	-0.289 [-1.033, 0.338]	$\alpha_{II}$	-0.415*** [-0.521, -0.348]
MA*large	$\beta_{23}$	-1.064 [-2.398, 2.087]	$\gamma_{23}$	1.735 [-1.458, 3.443]	$\lambda_I$	2.454 [-12.905, 18.055]
Large	$\beta_{24}$	-4.230*** [-6.998, -3.309]	$\gamma_{24}$	-14.000*** [-15.416, -10.914]	$\alpha_I + \lambda_I$	0.906 [-0.431, 3.318]
MA*ESHI*After	$\beta_{1e}$	-2.114*** [-4.324, -0.398]	$\gamma_{1e}$	-1.218** [-2.231, -0.043]	$\alpha_{II} + \lambda_I - \mu_{III}$	0.798*** [0.740, 0.867]
MA*ESHI*During	$\beta_{1e}^d$	0.157 [-1.689, 2.709]	$\gamma_{1e}^d$	0.278 [-0.454, 1.296]	$\alpha_I - \mu_{III}$	1.017** [0.308, 2.071]
MA*ESHI*After*<150FPL	$\beta_{2e}$	-2.226 [-4.851, 0.835]	$\gamma_{2e}$	-1.123 [-5.420, 2.825]	$\mu_{III}$	-2.564 [-18.402, 20.616]
MA*ESHI*During*<150FPL	$\beta_{2e}^d$	6.221*** [2.952, 8.774]	$\gamma_{2e}^d$	-2.098* [-4.854, 0.181]	$\mu_{II}$	1.241 [-14.137, 16.713]
MA*ESHI*After*150-300FPL	$\beta_{3e}$	-4.800*** [-7.251, -2.841]	$\gamma_{3e}$	8.143*** [5.316, 10.723]	$ESHI_{After}$	0.79 -
MA*ESHI*During*150-300FPL	$\beta_{3e}^d$	-7.109*** [-10.272, -5.326]	$\gamma_{3e}^d$	-8.062*** [-10.753, -5.966]	$b_I/\tau$	1 -
MA*ESHI*<150FPL	$\beta_{4e}$	-0.307 [-3.479, 1.001]	$\gamma_{4e}$	9.097*** [6.999, 11.489]	$b_{II}/\tau$	1 -
MA*ESHI*150-300FPL	$\beta_{5e}$	4.674*** [3.146, 6.016]	$\gamma_{5e}$	2.557** [0.280, 4.168]	$b_{III}/\tau$	1 -
MA*After*<150FPL	$\beta_{6e}$	-3.544*** [-5.420, -1.474]	$\gamma_{6e}$	3.161*** [1.563, 5.834]	$DWL_{mI}$	0.011*** [0.004, 0.555]
MA*During*<150FPL	$\beta_{6e}^d$	-1.783 [-3.270, 0.420]	$\gamma_{6e}^d$	-0.985 [-2.278, 0.620]	$DWL_{mII}$	6.830*** [2.693, 11.930]
MA*After*150-300FPL	$\beta_{7e}$	7.843*** [6.065, 10.224]	$\gamma_{7e}$	4.379*** [2.814, 6.399]	$DWL_{mIII}$	0.005*** [0.005, 11.129]
MA*During*150-300FPL	$\beta_{7e}^d$	9.785*** [8.124, 12.685]	$\gamma_{7e}^d$	11.624*** [10.433, 14.162]	$\frac{DWL_{mI}}{DWL_{\tau}}$	0.010*** [0.001, 5.030]
MA*ESHI	$\beta_{8e}$	-0.348 [-1.418, 0.736]	$\gamma_{8e}$	-0.357 [-1.174, 0.143]	$\frac{DWL_{mII}}{DWL_{\tau}}$	0.032*** [0.014, 0.053]
MA*<150FPL	$\beta_{9e}$	1.658 [-4.009, 7.585]	$\gamma_{9e}$	-0.323 [-16.317, 11.692]	$\frac{DWL_{mIII}}{DWL_{\tau}}$	0.001*** [0.001, 5.970]
MA*150-300FPL	$\beta_{10e}$	-6.432** [-12.749, -1.972]	$\gamma_{10e}$	-4.329 [-13.410, 5.062]		
MA*After	$\beta_{11e}$	4.115*** [2.690, 5.289]	$\gamma_{11e}$	1.682*** [0.602, 2.392]		
MA*During	$\beta_{11e}^d$	-0.378 [-2.935, 1.100]	$\gamma_{11e}^d$	0.327 [-0.603, 0.958]		
ESHI*After	$\beta_{12e}$	-0.334 [-1.962, 1.626]	$\gamma_{12e}$	-0.652 [-1.550, 0.318]		
ESHI*During	$\beta_{12e}^d$	-1.435 [-3.738, 0.234]	$\gamma_{12e}^d$	-0.633* [-1.463, 0.060]		
ESHI*After*<150FPL	$\beta_{13e}$	-0.105 [-2.983, 3.127]	$\gamma_{13e}$	0.908 [-2.121, 4.705]		
ESHI*During*<150FPL	$\beta_{13e}^d$	2.601** [0.251, 5.848]	$\gamma_{13e}^d$	1.64 [-0.798, 4.648]		
ESHI*After*150-300FPL	$\beta_{14e}$	-0.388 [-2.444, 2.120]	$\gamma_{14e}$	0.808 [-1.169, 3.254]		
ESHI*During*150-300FPL	$\beta_{14e}^d$	1.181 [-0.893, 3.454]	$\gamma_{14e}^d$	1.031 [-0.303, 2.436]		
ESHI*<150FPL	$\beta_{15e}$	-0.591 [-1.897, 1.246]	$\gamma_{15e}$	0.074 [-1.252, 1.632]		
ESHI*150-300FPL	$\beta_{16e}$	-1.695*** [-2.938, -0.514]	$\gamma_{16e}$	-0.433 [-1.772, 1.221]		
After*<150FPL	$\beta_{17e}$	0.284 [-1.892, 1.913]	$\gamma_{17e}$	-0.759 [-2.845, 0.579]		
During*<150FPL	$\beta_{17e}^d$	-1.753*** [-3.777, -0.534]	$\gamma_{17e}^d$	-1.127** [-2.467, -0.058]		
After*150-300FPL	$\beta_{18e}$	1.084 [-0.912, 2.830]	$\gamma_{18e}$	-0.23 [-1.803, 1.444]		
During*150-300FPL	$\beta_{18e}^d$	-0.811 [-2.839, 0.773]	$\gamma_{18e}^d$	-0.368 [-1.428, 0.865]		
ESHI	$\beta_{19e}$	2.522*** [1.510, 3.395]	$\gamma_{19e}$	0.980** [0.226, 1.478]		
After	$\beta_{22e}$	1.049* [-0.207, 2.331]	$\gamma_{22e}$	1.462*** [0.686, 2.372]		
During	$\beta_{22e}^d$	1.703*** [0.395, 4.014]	$\gamma_{22e}^d$	1.219*** [0.615, 1.951]		
Observations		495,352		479,310		
R-squared		0.759		0.842		

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1, 95% confidence intervals reported; CIs block bootstrapped by state.

Excluding >=age 65, Medicare beneficiaries, military health insurance beneficiaries. Only includes interview months.

All specifications include individual, state, and state\*large firm fixed effects. Monthly weights used.

Large firm defined as >25 employees.

# Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing

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Over the past 3 decades, the U.S. Temporary Help Services (THS) industry grew five times more rapidly than overall employment. Contemporaneously, courts in 46 states adopted exceptions to the common law doctrine of employment at will that limited employers' discretion to terminate workers and opened them to litigation. This article assesses the contribution of "unjust dismissal" doctrine to THS employment specifically, and outsourcing more generally, finding that it is substantial—explaining 20% of the growth of THS between 1973 and 1995 and contributing 500,000 additional outsourced workers in 2000. States with smaller declines in unionization also saw substantially more THS growth.

Between 1979 and 1995, the Temporary Help Supply (THS) industry in the United States grew at 11% annually—over five times more rapidly

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**Table 1**  
**THS Employment by Geographic Region and Year, 1979–2000: Employed Workers (1,000s) and Percentage of Nonfarm Employment**

	Northeast (9 States) (%)	Midwest (12 States) (%)	South (16 States) (%)	West (13 States) (%)	Total (50 States) (%)
1979	114.5	104.4	104.9	109.1	432.9
	.66	.51	.46	.78%	.58
1983	111.1	75.8	112.0	97.1	396.0
	.65	.42	.48	.69	.55
1987	198.9	188.5	234.2	172.4	794.1
	1.00	.90	.86	1.01	.93
1991	203.5	280.3	480.8	260.6	1,225.2
	1.02	1.22	1.61	1.36	1.33
1995	352.3	571.0	970.1	495.5	2,388.9
	1.73	2.12	2.87	2.42	2.39
2000					3,887.0
					2.95

SOURCES.—County Business Patterns, 1979–95; Bureau of Labor Statistics National Employment, Hours, and Earnings, available at <http://www.bls.gov>.

NOTE.—Percentage of nonfarm employment appears below employment count.

than U.S. nonfarm employment—and increased its daily head count from 435,000 to 2.4 million workers (table 1). During these same years, what many have termed a revolution in jurisprudence toward worker dismissal occurred as U.S. state courts recognized exceptions to the common law doctrine of employment at will. That doctrine, which had been recognized throughout the United States by 1953, held that employers and employees have unlimited discretion to terminate their employment relationships at any time for any reason unless explicitly contracted otherwise. The recognition of exceptions to employment at will by 46 state courts between 1973 and 1995 limited employers' discretion to terminate workers and opened them to potentially costly litigation.<sup>1</sup> This article assesses whether these contemporaneous phenomena—the erosion of employment at will and the rapid growth of THS—are causally related. More generally, the article answers the question of whether changes to the legal environment surrounding worker dismissal are in part responsible for the growth of “contingent” work arrangements in the U.S. economy, the most prominent example of which is temporary help employment. The answer appears to be yes.

The analysis proceeds as follows: Section I introduces the three classes of common law exception to the at-will doctrine, evaluates their impli-

<sup>1</sup> Of course, employers' power to terminate at will has not been absolute for some time. Major pieces of federal legislation that protect the employment rights of minorities, union members, persons over the age of 40, and persons with disabilities include Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1991, the National Labor Relations Act, the Age Discrimination in Employment Act of 1967, and the Americans with Disabilities Act of 1992.

cations for THS and other “outsourced” employment, and concludes that one exception in particular—the implied contractual right to continued employment (“implied contract”)—provides a compelling incentive for firms to utilize temporary help workers. Section II considers a simple model of employment outsourcing in the presence of positive firing costs. The key implication of the model is that employers are likely to respond to mandated firing costs by outsourcing jobs that require limited firm-specific capital, an implication that aptly describes the occupations typically supplied by THS. Section III describes the data and empirical strategy, and Section IV provides empirical results. Section V concludes.

A key finding of the present analysis is that state courts’ adoption of the implied contract doctrine has resulted in approximately 22% excess temporary help employment growth in adopting states. In addition, states experiencing smaller declines in unionization saw substantially greater THS growth. Unjust dismissal doctrines did not significantly contribute to employment growth in other business service industries, however. In net, the results indicate that changes to the employment-at-will doctrine explain as much as 20% of the growth of THS between 1973 and 1995 and account for 365,000–530,000 additional workers employed in THS on a daily basis as of 2000.

The present analysis is related to empirical analyses by Dertouzos and Karoly (1992), Morriss (1995), Kugler and Saint-Paul (2000), and Autor, Donohue, and Schwab (2001), who explore the impacts of unjust dismissal doctrine on overall employment levels and growth, job termination probabilities, and job-to-job flows; to recent work evaluating the impacts of civil rights legislation on the employment of the disabled (DeLeire 2000; Acemoglu and Angrist 2001) and minorities (Donohue and Heckman 1991; Oyer and Schaefer 2000, 2002); and to research on the impact of labor-market flexibility on labor force participation, employment, and unemployment in countries in the Organization for Economic Cooperation and Development (OECD; Lazear 1990; Di Tella and MacCulloch 1998; Blanchard and Portugal 2001). Morriss (1995) offers a thorough review of case law affecting employment at will, Epstein (1984) presents the major legal and economic arguments supporting the at-will doctrine, Segal and Sullivan (1997*a*) provide a comprehensive discussion of the growth of THS, and Abraham and Taylor (1996) and Houseman (2001) provide insightful analyses of the determinants of firms’ use of flexible staffing arrangements.

The unique contribution of the current study is to explore theoretically and empirically the impact that unjust dismissal doctrine has had on employment outsourcing. Lee (1996) and Segal and Sullivan (1997*a*) suggest a possible causal connection between the growth of THS and the decline of employment at will but do not investigate the question empirically. In independent contemporaneous work, Miles (2000) explores the impact of

common law exceptions to employment at will on a variety of labor-market aggregates and reports results for temporary help employment that are largely consistent with those presented here.<sup>2</sup>

### I. The Decline of Employment at Will

The employment-at-will doctrine was most famously articulated by the Tennessee Supreme Court in 1884, which wrote that “men must be left, without interference to buy and sell where they please, and to discharge or retain employees at will for good cause or for no cause, or even for bad cause without thereby being guilty of an unlawful act per se” (*Payne v. Western & Atlantic Railroad, Tennessee* 1884). Although largely uncontroversial at the turn of the century, the judicial consensus behind the at-will doctrine eroded rapidly beginning with the publication of an extraordinarily influential law review article by Blades (1967; see Morriss 1994). Prior this time, only one state (California in 1959) had recognized an exception to employment at will. But in the subsequent 2 decades, 44 additional states recognized exceptions, as is shown in figure 1. By 1992, 46 of 50 states had amended the at-will doctrine, in 45 of these cases judicially and in one case legislatively.<sup>3</sup> The tenor of these judicial decisions is exemplified in a court opinion from the 1985 Texas case of *Sabine Pilots, Inc. v. Hauck*: “Absolute employment at will is a relic of early industrial times, conjuring up visions of the sweat shops described by Charles Dickens and his contemporaries. The doctrine belongs in a museum, not in our law.”

By the early 1990s, state courts had recognized three common law exceptions to the at-will relationship: breach of an implied contractual right to continued employment, terminations contrary to public policy, and violations of an implied covenant of good faith and fair dealing. For reasons discussed below, only the first of these exceptions is likely to be relevant to the outsourcing of employment.

<sup>2</sup> Miles (2000) reports a significant impact of both the “implied contract” and “good faith” doctrines on temporary help employment, although it is shown below that only the first of these correlations is likely to be causal. Beyond this area of overlap, the present article explores the economic incentives for firms to outsource employment to THS and considers why the implied contract doctrine apart from other common law exceptions appears relevant to this choice. Additionally, it assesses the contribution of unjust dismissal doctrines and unionization to THS employment and other business services outsourcing.

<sup>3</sup> Montana is the one state that adopted a statute specifically defining a default employment contract other than employment at will, the Montana Wrongful Discharge from Employment Act of 1987. Interestingly, this legislative action may have been a response to a particularly broad incursion into the at-will doctrine by the Montana courts (cf. Krueger 1991; Morriss 1995).

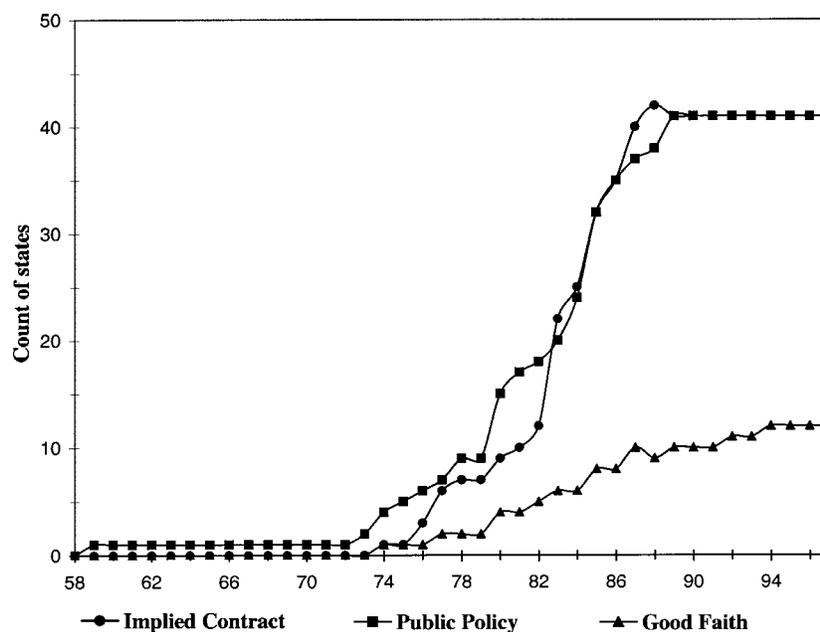


FIG. 1.—Count of states recognizing exceptions to the employment-at-will doctrine, 1958–97.

#### A. The Implied Contract Exception to Employment at Will

A landmark decision in the recent erosion of employment at will is the 1980 case of *Toussaint v. Blue Cross & Blue Shield*, in which the Michigan Supreme Court held that an employer's indirect statements about the manner in which termination decisions are made can imply legally binding employment contracts.<sup>4</sup> In *Toussaint*, the plaintiff successfully sued for breach of contract by citing an internal personnel policy handbook indicating that it was Blue Cross's policy to terminate employees only for just cause. Although Toussaint was unaware of the handbook when hired, the court held that the handbook implied a binding contract. Courts in 23 other states issued similar decisions over the next 5 years. An equally influential 1981 California case, *Pugh v. See's Candies*, further expanded the implied contract notion by finding that workers are entitled to ongoing employment even in the absence of written or indirect statements if contractual rights are implied via the context of the employment relationship. This context may include, for example, longevity of service, a history of promotion or salary increases, general company policies as exemplified

<sup>4</sup> Full citations for precedent setting cases cited in the text are given in table A1.

by treatment of other employees, or typical industry practices. Cumulatively, these court decisions generated substantial uncertainty surrounding termination, resulting in numerous cases where courts found that employees held implied contractual employment rights that employers had clearly not intended to offer.<sup>5</sup>

Systematic data on the costs of unjust dismissal suits are sparse because fewer than 3% of these suits reach a jury, and the vast majority settle (Jung 1997). Among California implied contract actions studied by Jung, plaintiffs prevailed in 52% of cases, with average and median compensatory damages of \$586,000 and \$268,000, respectively. In addition to jury awards, legal fees in the cases studied by Dertouzos, Holland, and Ebener (1988) averaged \$98,000 in cases where the defense prevailed and \$220,000 in cases where the plaintiff prevailed. Underscoring the fact that large transaction costs are the norm, the average net award received by plaintiffs was only 48% of the money changing hands.<sup>6</sup>

Indirect costs are likely to be substantial. The threat of litigation will prompt forward-looking employers to take avoidance actions such as revising employment manuals, limiting the discretion of managers to hire and fire, instigating bureaucratic procedures for documenting and terminating poorly performing employees, and potentially retaining unproductive workers who would otherwise be fired. These steps, while potentially costly, are difficult to quantify.<sup>7</sup> Additionally, since there are no representative data available on the share of terminations leading to unjust dismissal suits, it is not possible to compute a measure of expected direct employer cost.

#### B. Implications of the Implied Contract Exception for Temporary Help Employment

There is substantial evidence that employers were aware of the changing legal environment and responded to it by attempting to “contract around”

<sup>5</sup> A defendant’s attorney interviewed for this research stated that the implied contract doctrine leaves open “the largest room for creativity” on the part of plaintiffs’ attorneys because the definition of what constitutes an indirect or contextual statement of contractual rights is open to broad interpretation (personal communication with Barry Guryan, January 14, 2000).

<sup>6</sup> Figures from Dertouzos et al. (1988, table 16) and Jung (1997) are inflated to 1999 dollars using the Personal Consumption Expenditure deflator. Dertouzos et al. do not provide disaggregated data, and hence these figures apply to all unjust dismissal suits rather than just implied contract suits. Both studies use California data, which is most frequently studied because of the state’s accessible electronic case reporting system.

<sup>7</sup> Lewin (1987) reports that managers implicated by employee complaints of wrongful treatment may also suffer diminished career advancement, even in instances where the complaint is ultimately unsuccessful. This finding suggests that unjust dismissal doctrines may induce agency problems in which risk-averse managers take unduly costly actions (from the firm’s perspective) to avoid litigation.

the implied contract exception. Edelman, Abraham, and Erlanger (1992) document that throughout the 1980s, personnel and professional law journals published a flurry of articles warning employers—often in hyperbolic terms—of the liability risks imposed by unjust dismissal doctrines.<sup>8</sup> The Bureau of National Affairs (1985) found that 63% of employers surveyed in the early 1980s had recently “removed or changed wording in company publications to avoid any suggestion of an employment contract,” and 53% of employers had “added wording to applications and handbooks specifying that employment may be terminated for any reason.” Sutton and Dobbin (1996) also report that the percentage of firms using “at-will” clauses in employment contracts increased from 0% to 29% between 1955 and 1985.

In practice, however, the courts have made it difficult for employers to contract around the risk posed by implied contract suits. For example, courts have ruled that employers’ progressive discipline policies—stipulating that workers will not be fired for poor performance without first receiving successive warnings—demonstrate the intent of an implied contract of ongoing employment. Similarly, courts have taken employers’ 401K and other retirement programs as evidence of an expectation of long-term employment. And in 15 states that currently recognize the implied-contract exception, courts have held that signed disclaimers waiving implied contract rights do not, in fact, nullify these rights (Walsh and Schwarz 1996). Perhaps ironically, courts have also ruled that probationary hiring periods can themselves create an implied contract once the probationary period is complete.<sup>9</sup>

These court decisions have not extended to temporary help, however, which remains a relatively “safe” alternative for employers wishing to avoid termination risks associated with the implied-contract exception. Because THS employment is by nature temporary, there is little in the policies or business practices of THS employers that would likely be held by the courts to imply a contractual right to ongoing employment. Nor is there any precedent for finding client firms in violation of implied contracts for terminating workers on assignment through a THS firm (Lenz 1997). Hence, employers in states that have adopted the implied-

<sup>8</sup> The popular press also called attention to these legal developments. For example, a 1985 *Business Week* cover story entitled “Beyond Unions: A Revolution in Employee Rights Is in the Making” warned that “the time is coming when nonunion employees will no longer serve entirely at the employer’s will—the so-called employment-at-will doctrine that has prevailed in the United States since the late 1800s. Slowly but inexorably, judicial and legislative law is recognizing that even nonunion employees have an implicit employment contract that is enforceable in the courts” (Hoerr et al. 1985, p. 73).

<sup>9</sup> *Walker v. Northern San Diego County Hospital District* (135 Cal. App. 3d 896, 1982).

contract exception might be expected to face greater incentive to “out-source” employment to THS firms.<sup>10</sup> I discuss this point in more detail below.

### C. Other Exceptions to Employment at Will

In addition to the implied contract exception, many state courts have recognized two other exceptions to the at-will doctrine. The public policy exception, currently recognized by 41 states, bars employers from terminating employees for reasons that would contravene a statutory public policy. Essentially, this doctrine makes it illegal to retaliate against employees for upholding the law or exercising their statutory rights, for example, by attending jury duty, whistle-blowing, or refusing to commit a fraudulent act. A second less-widely recognized exception, the implied covenant of good faith and fair dealing, bars employers from terminating employees to deprive them of earned benefits, such as collecting an end-of-year sales bonus or a drawing a pension.<sup>11</sup>

While in theory the public policy and good faith doctrines may have consequences for employer conduct (cf. Dertouzos and Karoly 1992; Verkerke 1995; Morriss 1996; Olson 1997; Miles 2000; Autor et al. 2001), they are less likely to be relevant to outsourcing in general and THS employment in particular. The reason is that violations of these doctrines are actionable regardless of the identity of the employer (whether conventional firm or THS). Additionally, federal courts have ruled that staffing arrangements—which include temporary help—cannot be used to shield companies from civil-rights compliance. Hence, there is little reason to believe that the public policy and good faith exceptions confer a distinct legal advantage to THS firms.<sup>12</sup>

<sup>10</sup> Managers of manufacturing plants interviewed by Ballantine and Ferguson (1999, p. 5) explicitly mention using temporary workers to avoid legal risks. Quoting one interviewee, “We have temporaries here that have been here over a year. . . . We’ve also had people who have not worked out. We’ve had sexual harassment. We’ve had racial issues. We’ve had some drug issues and man, you get rid of those people fast. You don’t have to worry about anything legal. You just end the assignment.”

<sup>11</sup> In a handful of states, the public policy exception is construed more broadly to protect any action encouraged by public policy. The good faith exception is also read more broadly in several states to bar all terminations that are in “bad faith.”

<sup>12</sup> The civil rights case of *Amarnare v. Merrill Lynch* (611 F. Supp. 344 S.D. N.Y. 1984, aff’d, 770 F.2d 157 2d Cir. 1985) established the “no shielding” precedent. While the common law exceptions to employment at will are distinct from civil rights laws, the Amarnare precedent is likely to apply. Accordingly, a client firm could be held liable for instigating the termination of a THS worker in violation of the public policy or good faith doctrines.

## II. A Model of the Impact of Firing Costs on Employment Outsourcing

Why don't firms outsource all of their workers to circumvent firing costs? The hypothesis explored here is that by outsourcing employment, firms forgo productive specific human capital investments (in the sense of Becker 1964) that directly hired workers would otherwise undertake. Since specific capital is only valuable at the current job, workers facing briefer expected tenure make smaller specific capital investments. Recognizing this, firms may optimally precommit to longer tenure by hiring workers directly—particularly for occupations where specific capital is highly productive—even if THS arrangements offer lower firing costs.

Anecdotal evidence suggests that specific capital is indeed relevant to firms' outsourcing decisions. For example, in a study of the productivity consequences of temporary help outsourcing, Kahn (2000, pp. 242–43) writes, "In their decisions about the level of temp use, managers were extremely aware of the kinds of jobs where temps were useful and the kinds of jobs where this was not the case. For instance, one manager noted, 'Temps can describe the products we sell and take orders, but we would never hire a temp to handle customers unsatisfied with the service.' Managers also knew that when company-specific knowledge and experience were needed for the job, temps were inappropriate. . . . When only a modest amount of firm-specific experience was necessary, companies' policies made sure that the temps were well versed in the institutional knowledge and firms' computer systems by using the same temps repeatedly."

To study the impact of outsourcing on specific capital investment more formally, consider the following two-period model of employment where the first period consists of hiring and specific capital investment and the second period consists of production. There is a large number of identical, risk-neutral workers who live for two periods and a large number of firms. In period 1, workers and firms form matches and workers sink firm-specific skills investments  $s \in [0, \bar{s}]$  at cost  $c(s)$ , where  $c(\cdot)$  is a convex, strictly increasing, and continuously differentiable function with  $c(0) = 0$  and  $c'(0) = 0$ . Production and wages during this period are normalized to zero. At the close of the first period, the worker-firm pair receives a mean zero match-specific productivity shock,  $\eta$ , which can be thought of as realized match quality. For simplicity, I assume  $\eta$  has a uniform distribution,  $\eta \sim U[-z, z]$ .

If the worker-firm pair remains intact during the second period, the worker produces output of  $Y = \gamma \times s + \eta$ , where  $\gamma \geq 0$  is the productivity of specific capital investments at the job. If instead the pair splits, the worker receives an outside wage of zero. Additionally, if the worker was hired directly, the firm must pay a firing cost of  $\phi > 0$  to terminate

the position. If the firm hired the worker through THS, however, it pays no firing cost ( $\phi = 0$ ).

Since  $\gamma \times s$  is the return to firm-specific capital and  $\eta$  is a match-specific shock, neither is competitively priced, and their division will be determined by bargaining. I assume that wages are determined at the start of the second period by a Nash bargain, where the worker's bargaining power is given by the parameter  $\beta \in (0, 1)$ . If the worker-firm pair is unable to reach a bargain, the worker receives his outside wage of zero and the firm receives  $-\phi$ . Nash bargaining and risk neutrality imply that, if agreed, the worker's second period wage is:

$$w = \beta(\gamma \times s + \eta + \phi). \quad (1)$$

Three things about this setup deserve comment. First, it is important to stress that  $\phi$  represents a deadweight loss or a payment to an outside party such as a law firm and, hence, is not subject to Coasean compensation.<sup>13</sup> Second, the sole difference between direct hires and THS workers is that firms do not pay  $\phi$  to terminate THS workers. While in reality THS arrangements entail other transaction costs, including a sizable wage markup of 40%–50% (Autor, Levy, and Murnane 1999), I abstract from these details to emphasize that THS does not dominate direct hiring even absent transactions costs. Third, I assume that specific capital investments require observable but nonverifiable worker effort and commitment and are therefore not (fully) contractible.<sup>14</sup> Hence, as in Hashimoto (1981), Hart and Moore (1990), and Prendergast (1992, 1993), firms foster skill investment by rewarding realized productivity rather than by sharing in up-front investment costs. As is well known, if workers and firms can costlessly contract to share the costs and returns to specific skill investments, these investments will be made optimally. In this case, the trade-off expositied by the model would not be relevant. However, a growing theoretical and empirical literature demonstrates that because worker productivity is typically imperfectly observed by potential employers, human capital investments are likely to deviate significantly from the optimal case studied by Becker 1964 (cf. Acemoglu and Pischke 1999; Autor 2001). Hence, I consider the model germane to employer behavior.

#### A. The Impact of Firing Costs on Specific Skill Investments

Given the Nash bargain in equation (1), the worker-firm pair will only agree on a wage bargain if there is a positive surplus from continuing the relationship:

$$Y \geq -\phi. \quad (2)$$

<sup>13</sup> Any firing cost that is subject to Coasean compensation would also be present in the wage bargain but would not appear in  $\phi$ .

<sup>14</sup> In other words, the employer is able to observe the worker's specific capital investment, but a court would not.

Satisfaction of equation (2) further implies that  $w \geq 0$  and  $Y - w \geq -\phi$ ; a bargain is only feasible if the worker receives a nonnegative wage and the firm receives a continuation benefit at least equal to its firing cost.

Given equations (1) and (2), workers choose specific capital investment to maximize expected utility, which is the difference between expected earnings and the cost of specific capital investment:

$$\max_s E(U) = E(w|w \geq 0) \times P(w \geq 0) - c(s). \quad (3)$$

Using the uniform density to calculate expectations for  $\eta$ , the worker's first-order condition for specific capital investment is:

$$c'(s^*) = \frac{\beta\gamma(z + \gamma \times s^* + \phi)}{2z}. \quad (4)$$

This equation will have an interior solution at  $0 < s^* < \bar{s}$  provided that  $\gamma > 0$  and the training cost function is sufficiently convex.<sup>15</sup> As is visible from equation (4), the worker's skill investment is increasing in both the productivity of specific capital,  $\gamma$ , and in the worker's bargaining power. Critically, for purposes of the model, skill investment also depends positively on the firing cost. Because firing costs reduce the odds of termination in the second period, workers make larger specific skill investments when  $\phi$  is greater.<sup>16</sup>

#### B. Optimal Firing Costs versus Mandated Firing Costs

Now, consider the firm's trade-off between minimizing firing costs and maximizing specific capital investment. Expected profitability as a function of  $\phi$  is

$$E[\pi(\phi)] = \frac{(1 - \beta)[z + \gamma \times s(\phi) + \phi]^2}{4z} - \phi, \quad (5)$$

where I have written  $s(\phi)$  as an explicit function of  $\phi$  to underscore the dependence of specific skill investment on the firing cost. Observe that

<sup>15</sup> For simplicity, I also assume that  $\gamma \times s + \phi \leq z$ , which ensures that the probability bounds of the uniform distribution are not violated in eq. (4) and elsewhere. This assumption can be relaxed at no substantive cost by rewriting the expectation functions with minimums and maximums at  $-z$  and  $+z$ , respectively.

<sup>16</sup> Note that with a sufficiently skewed density function for  $\eta$ , it is possible to obtain the opposite result—that greater ex ante odds of termination increase worker skill investments. For example, if the probability mass of  $\eta$  were primarily concentrated at a threshold value, workers might invest heavily in specific capital to overcome this threshold. Substantively, because retaining a job using specific capital has a rent attached, added uncertainty could induce workers to make larger precautionary specific skill investments. Because of the unusual assumptions required on  $\eta$ , I consider this case remote.

$\phi$  enters both the credit and debit side of equation (5). Although  $\phi$  raises the cost of terminating workers, it also raises the expected profitability of those workers who are retained by increasing their incentives to make specific skill investments. This equation indicates that, independent of court mandates, firms may find it optimal to adopt positive firing costs  $\phi^*(\gamma) > 0$ , particularly for occupations where  $\gamma$  is large. Logically, the gain to firing costs is greater where specific capital investments are more productive ( $\gamma$  large):

$$\frac{\partial^2 \pi}{\partial \gamma \partial \phi} \geq 0. \quad (6)$$

How will firms respond when courts impose firing costs  $\tilde{\phi}$ ? Clearly, if optimal firing costs exceed mandated firing costs ( $\phi^*(\gamma) \geq \tilde{\phi}$ ), then  $\phi$  is nonbinding. But if mandated firing costs exceed optimal firing costs ( $\tilde{\phi} > \phi^*(\gamma)$ ), a subset of firms will find it more profitable to outsource despite the forgone specific capital investment. The likelihood that a firm will choose to outsource a given occupation depends directly on the magnitude of  $\phi^*(\gamma)$ . For occupations where specific capital is quite productive ( $\gamma$  large), the changing legal regime is unlikely to induce outsourcing because firms will have already written contracts more restrictive than  $\tilde{\phi}$ , and outsourcing these jobs may discourage substantial productive investment. Conversely, for occupations where specific capital is of minimal import, any increase in firing costs may be sufficient to yield employment outsourcing. Hence, the model suggests that firms will primarily respond to court-mandated firing costs by outsourcing those occupations that require the least specific capital.<sup>17</sup>

### C. Which Occupations Do Firms Outsource?

Do firms outsource low specific capital occupations to temporary help firms? Workers supplied by THS firms work overwhelmingly in occupations that rely on general, interchangeable skills. For example, low-skilled blue collar and administrative support occupations make up 63% of temporary help employment versus 30% of overall employment.<sup>18</sup> And even among white-collar occupations, THS workers are predominantly found in technical, computer, and medical occupations (such as nursing),

<sup>17</sup> If firing costs are also increasing in  $\gamma$ , then the relative profitability of outsourcing high versus low  $\gamma$  workers will depend on whether the marginal profitability of specific capital investment rises more or less quickly than the marginal firing cost. Since in theory the implied contract exception allows plaintiffs to sue for contractual economic losses (which could include the lost value of specific capital investment), it is plausible that  $\phi$  will depend positively on  $\gamma$ .

<sup>18</sup> Figures are from Cohany (1998), table 6, for operators, fabricators and laborers and administrative support, including clerical occupations.

where again skills are quite general (U.S. Department of Labor 1996, table 2).

To gauge the relevance of this relationship more rigorously, I combine data on the THS share of employment by detailed occupation during 1995–2001 with information on the prevalence of on-the-job training in each occupation (excluding THS).<sup>19</sup> Using these data, I explore whether THS penetration is greater in occupations that receive comparatively little workplace skills training. Specifically, I estimate the equation:

$$\text{THSshare}_j = \alpha + \beta_1 \times \text{Trained}_j + \beta_2 \text{Tenure}_j + \varepsilon_j, \quad (7)$$

where ( $j$ ) indexes 485 detailed (three-digit) occupations, THSshare is the average share of employment in the occupation supplied by THS firms during 1995–2001, and Trained is the share of (non-THS) workers in the occupation who report receiving skills training at their current jobs. Additionally, I control for mean job tenure in each occupation since omission of this variable could plausibly induce a spurious negative correlation between the share of workers trained at their jobs and the share of workers supplied by THS.

Estimates of equation (7), found in table 2, demonstrate that occupational training levels are a statistically and economically significant determinant of occupational THS penetration. A one-standard-deviation (SD) increase in the share of workers in an occupation receiving training at their jobs is associated with a 25% reduction in the mean occupational THS share. As would be expected, THS employment is also substantially lower in occupations with high average tenure. However, inclusion of the tenure variable only moderately reduces the estimated negative relationship between occupational skills training and THS penetration.

Additional estimates in table 2 replace the aggregate skills training variable with its subcomponents: school-based, formal employer-based, informal on-the-job, and other training. The negative relationship between training and THS penetration is reasonably pervasive across training ven-

<sup>19</sup> The THS occupational penetration measure is calculated from the combined CPS Contingent Worker Supplements for February 1995, 1997, 1999, and 2001 as the fraction of all currently employed workers in an occupation who are paid by a THS agency. Estimates are weighted by the overall fraction of national employment in each occupation in each year averaged over the four CPS Contingent Worker Supplements. Average tenure and training in each occupation are calculated from the January 1991 CPS Job Training Supplement for currently employed workers and are averaged to the occupation level using supplementary survey weights provided by the Bureau of Labor Statistics. All training measures refer to training obtained to improve skills at present job. The 1991 survey provides the most recent year of job training data available from the CPS.

**Table 2**  
**The Relationships among Occupational THS Penetration, Job Skills Training, and Employee Tenure in Detailed (Three-Digit) Occupations, 1995–2001**

	Means (SD)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of workers trained at current job	.42 (.21)	–1.21 (.30)		–.93 (.32)				
Average worker tenure (years)	7.14 (2.58)		–.09 (.02)	–.06 (.03)	–.06 (.03)	–.08 (.03)	–.09 (.02)	–.05 (.02)
Share receiving in-school training	.16 (.12)				–1.46 (.49)			
Share receiving formal company training	.14 (.14)					–.70 (.54)		
Share receiving on-the-job training	.16 (.07)						.63 (.91)	
Share receiving other training	.08 (.07)							–4.88 (.88)
Intercept	.93 (1.39)	1.44 (.14)	1.56 (.18)	1.75 (.19)	1.57 (.18)	1.61 (.19)	1.49 (.21)	1.66 (.18)
$R^2$		.034	.028	.045	.046	.031	.029	.086

NOTE.—THS = temporary help services. Dependent variable:  $100 \times$  share of occupational employment provided by THS;  $n = 485$  detailed (three-digit) occupations. Ordinary least squares estimates given, and SEs are in parentheses. Tenure and training at current job are calculated from the January 1991 Current Population Survey Job Training Supplement for currently employed (non-THS) workers averaged to the occupation level using supplementary survey weights provided by the Bureau of Labor Statistics. All training measures refer to training obtained to improve skills at present job. The dependent variable is calculated from the combined CPS Contingent Worker Supplements for February 1995, 1997, 1999, and 2001. Estimates are weighted by the overall fraction of national employment in each occupation in each year averaged over the four CPS Contingent Worker Supplements.

ues. Apparently, firms do not typically outsource jobs in which skill investments are large.<sup>20</sup>

To summarize, in a labor market with imperfectly verifiable skills investments, firms may find it optimal to adopt positive firing costs to encourage workers to invest in specific human capital. Courts' imposition of mandated firing costs causes firms to outsource those jobs for which the mandated costs far exceed the firm's optimum. The jobs most likely

<sup>20</sup> Informal on-the-job training has no relationship with THS penetration. One reason may be that this variable measures a poorly defined construct. The strongest relationship found is for "other" types of training, which is unfortunately difficult to interpret. Recent work by Varejão and Portugal (2001) also confirms these relationships. Using data from Portugal, where firing costs are among the highest in the OECD (OECD 1999), Varejão and Portugal show that firms that invest relatively heavily in worker skill training are substantially less likely to hire workers on temporary contracts and yet are far more likely to convert workers hired on temporary contract to permanent status.

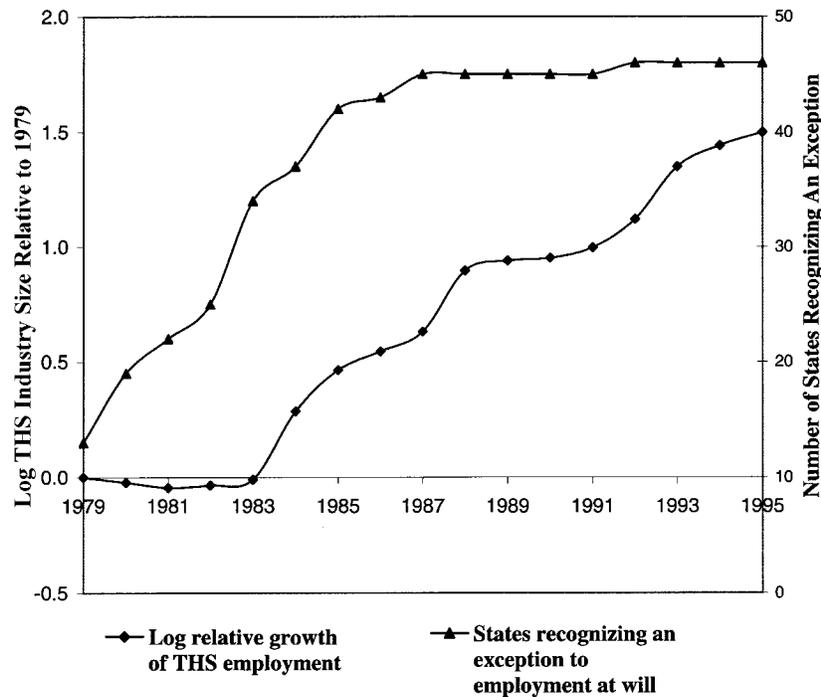


FIG. 2.—Log state temporary help supply industry growth, 1979–95, and number of states recognizing an exception to the employment-at-will doctrine.

to meet this criterion are those that rely heavily on general rather than firm-specific skills—which is a fair description of the occupations supplied by the THS industry. It therefore appears plausible that state courts' adoption of the implied contract exception may increase the demand for THS outsourcing.

### III. Empirical Framework and Data

#### A. Empirical Framework

Figure 2 presents the time series of U.S. states recognizing common law exceptions to employment at will between 1979 and 1995 alongside a plot of the unweighted average log size of THS employment in each state relative to 1979 after adjusting for state employment growth. The figure reveals a striking similarity in the movements of the two series, particularly after 1983. Of course, this relationship may not be causal. By exploiting the fact that the common law exceptions are adopted in different states and years, I assess their causal impact by contrasting THS employment growth in adopting and nonadopting states. Specifically, I es-

estimate differences-in-difference (or, more generally, fixed-effects) models of the form:

$$\begin{aligned} \ln(\text{THS}_{jt}) = & \alpha + \delta(\text{Common Law Exceptions}_{jt}) \\ & + \lambda(\ln \text{Nonfarm Emp}_{jt}) \\ & + \zeta(\text{Lab Force Demographics}_{jt}) \\ & + \mu_j + \tau_t + \varepsilon_{jt}, \end{aligned} \quad (8)$$

where the dependent variable is log temporary help employment in state ( $j$ ) and year ( $t$ ). In addition to dummies for adoption of common law exceptions, all estimates include a vector of state dummies,  $\mu_j$ , that control for mean differences in THS employment across states, and year dummies  $\tau_t$ , that control for THS growth common to all states. Some models also control for state nonfarm employment, labor force demographics, linear and quadratic state time trends, and region-by-year dummy variables. Because recent analyses demonstrate that pervasive serial correlation in state level difference-in-difference models may produce severely downward-biased standard errors (SE; Bertrand, Duflo, and Mullainathan 2001; Donald and Lang 2001), I use Huber-White SEs clustered at the state level throughout. These SEs are robust to arbitrary forms of error correlation within a state.

In applying the difference-in-difference framework to the data, it is important to consider carefully the “experiment” created by these court decisions. In the ideal case, the court decisions would be independent, random events that varied in timing and had no spillover effects to non-adopting states. If so, equation (8), if correctly specified, will provide an unbiased estimate of the average “treatment” effect,  $\delta$ .

The present analysis differs from this ideal case. The court rulings should not be viewed as independent events since 79 exceptions were recognized in 1979–95 as opposed to 20 in the preceding 2 decades. Because a movement to revise the at-will doctrine was visibly under way, firms may have responded preemptively, potentially by increasing demand for temporary help. Additionally, if the common law exceptions led to rapid growth of THS in affected states, this is likely to have contributed to the maturation and diffusion of an industry that, historically, was small and unsophisticated (Moore 1965). The differences-in-differences framework will fail to capture these effects if present, thereby potentially understating the total contribution of common law exceptions to the growth of THS.

Alongside these shortcomings, the common law exceptions have two virtues. First, the law changes are discrete. Second, because a court’s issuance of a new precedent is an idiosyncratic function of its docket and the disposition of its justices, the timing of a change to the common law

is likely to be in part unanticipated. Hence, even partly unanticipated law changes may generate discontinuous impacts on THS employment. The empirical approach will identify the extent of these discontinuous impacts.<sup>21</sup>

### B. Data Sources

To create a time series of state level THS and other business services industry employment, I use data from the Census Bureau's County Business Patterns (CBP) files for the years 1979–95. These data, collected annually from a theoretically complete universe of U.S. employers, provide a count of the total number of workers on THS payrolls during the month of March in each state and year. The CBP data do not distinguish between temporary and permanent employees of THS establishments, and hence line staff are included in these counts, although their employment share is likely to be small. The 1987 revision to the Standard Industrial Classification System (SIC) expanded the Temporary Help Supply Services industry (7362) to a slightly broader aggregate, Personnel Supply Services (7363). To the degree that this expansion is proportional across states, it will be absorbed by year effects.

As control variables for the THS employment equations, I use state-level nonfarm employment counts drawn from the Bureau of Labor Statistics State and Area Employment Statistics. I use the Outgoing Rotation Group (ORG) files of the Current Population Survey (CPS) for 1979–95 to create demographic controls for summary characteristics of the labor force in each state and year, including education, gender, age, marital status, and industry employment composition in one-digit CIC industries. For estimates of state-level union penetration, I use data from Hirsch, Macpherson, and Vroman (2001).

To characterize the state-by-year time series of exceptions to employment at will, I rely on Morriss (1995), who characterizes the relevant case law to 1989. For subsequent years, I combine information from Postic (1994) and the Bureau of National Affairs (1997). The cases cited for each exception are found in appendix A, table A1. The reader should be aware that characterizing the status of the common law is an inexact science, so in order to mitigate concerns about subjectivity, all of the results presented below were also estimated using the characterization developed by Dertouzos and Karoly (1992). The findings are neither qualitatively nor (sub-

<sup>21</sup> In their study of the impact of the decline of employment at will on state (non-THS) employment levels, Dertouzos and Karoly (1992) use a number of measures of states' legal and political climates as instrumental variables for the adoption of common law exceptions. While these factors may influence the probability of an adoption, the assumption that they are otherwise orthogonal to labor market conditions is suspect. Autor et al. (2001) demonstrate the substantial biases introduced by this instrumental variables approach.

**Table 3**  
**The Estimated Impact of Common Law Exceptions to Employment at Will on THS Employment, 1979–95**

Exceptions Recognized	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Implied contract	.112 (.099)	.136 (.063)					.096 (.099)	.137 (.062)
Public policy			.135 (.092)	-.026 (.060)			.126 (.094)	-.023 (.058)
Good faith					.106 (.113)	-.071 (.095)	.100 (.113)	-.079 (.093)
State and year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State × time trends	No	Yes	No	Yes	No	Yes	No	Yes
R <sup>2</sup>	.969	.988	.969	.988	.968	.988	.969	.988

SOURCE.—For dependent variable, see County Business Patterns, various years.

NOTE.—THS = temporary help services. Dependent variable: log state THS employment;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. For state common law information, see table A1.

stantially) quantitatively affected by the use of this alternative characterization.

Because the THS employment data are assembled from complete establishment counts and, hence, do not contain systematically heteroskedastic measurement error, estimates found in the body of the article are unweighted. Estimates that use state mean employment as weights, found in table B1, are closely comparable to unweighted estimates and are discussed briefly in the text.<sup>22</sup>

## IV. Empirical Results

### A. Initial Estimates

Summary data on THS employment by region and year are found in table 1, and initial estimates of equation (8) are found in table 3. Each column presents a regression of the log of state THS employment on state and time dummies, state linear time trends (in even-numbered columns), and indicator variables for the three common law exceptions, which are equal to one if an exception is present in a given state and year and zero otherwise. The first two columns contain the estimated impact of the implied contract exception on THS employment. The coefficient of 0.112 in column 1 indicates that after removing mean state THS levels and common year effects, THS employment grew by approximately 11.2 log points more in states adopting the implied contract exception than in nonadopting states. This impact is estimated imprecisely, however. The second column adds 50 state-specific time trends to the model, increasing the point estimate slightly to 13.6 log points and reducing the SE con-

<sup>22</sup> Since the empirical objective is to estimate the average “treatment” effect of common law exceptions on THS in percentage terms, there is also no a priori reason to place more weight on larger states.

siderably. An  $F$ -test of the hypothesis that the state trends are jointly zero is strongly rejected by the data, and hence I employ these linear trends in most specifications.

Comparable models estimated with the public policy and good faith exceptions are found in columns 3–6. Although both common law exceptions appear initially to contribute to the growth of THS, each point estimate becomes insignificantly negative once state trends are included. It appears that both the public policy and good faith exceptions were adopted in states where THS was already growing rapidly.

The last two columns of table 3 estimate the impact of the three exceptions simultaneously. The point estimate for each common law exception is only minimally affected by the inclusion of the others. The implied contract exception remains robust with a coefficient of 13.7 log points. The public policy and good faith exceptions are again insignificant once state trends are accounted for. Because these doctrines remain insignificant in the remainder of the analysis, they are not reported in subsequent tables, although they are always included in regression models.

#### B. Does the Specific Doctrine Matter?

The results in table 3 suggest that the implied contract doctrine is the only one of the three exceptions to employment at will to affect THS employment. It is possible, though, that it is not the implied contract doctrine in itself that matters but simply the fact that any exception to employment at will has been adopted (or the accumulation of multiple exceptions). To examine this issue, I begin with the specification from column 8 of table 3 (containing state time trends) and introduce in table 4 a variety of explanatory variables designed to control for the number or existence of legal exceptions in a state. The second column of table 4 shows that merely having any of the three legal exceptions to employment at will does not have an impact on state THS employment. The third column of table 4 reveals that the count of the number of legal exceptions does not correlate with a statistically significant increase in THS employment, nor do dummies indicating the individual presence of one, two, or three exceptions. Indeed, whether one controls for the existence of any legal exception (col. 5) or the count of the number of exceptions (col. 6), the implied contract dummy consistently has a positive and significant coefficient. It appears that the individual legal doctrine—as opposed to the existence of a single or number of exceptions—matters.

#### C. Controlling for Other Covariates

I next test the robustness of the results by controlling for a richer set of covariates, including state employment, quadratic state time trends, region-by-year effects, and labor-force demographics. Estimates are found

**Table 4**  
**The Estimated Impact of Common Law Exceptions to Employment at Will on THS Employment, 1979–95: Testing the Impact of the Number of Doctrines versus the Specific Doctrines**

Exceptions Recognized	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Implied contract doctrine	.137 (.062)				.126 (.067)	.216 (.116)	.151 (.085)
Public policy doctrine	-.023 (.058)				-.031 (.082)	.056 (.109)	.007 (.057)
Good faith doctrine	-.079 (.093)				-.084 (.090)		-.088 (.145)
Any doctrine		.071 (.065)			.022 (.091)		
Count of doctrines			.034 (.032)			-.079 (.093)	
One doctrine				.075 (.068)			
Two doctrines				.057 (.072)			-.055 (.092)
Three doctrines				.153 (.126)			.029 (.212)
$R^2$	.99	.99	.99	.99	.99	.99	.99

SOURCE.—For dependent variable, see County Business Patterns, various years.

NOTE.—THS = temporary help services. Dependent variable: log state THS employment;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. All models include state and year main effects and state specific linear time trends. For state common law information, see table A1.

in table 5. A first specification check addresses the concern that the states that adopted the implied contract were simply those undergoing faster employment growth. This would be true if courts in states with robust economies were particularly inclined to “liberalize” the employment regime. Column 1 of table 5 adds a control for the log of state nonfarm employment to the baseline specification, which obtains a coefficient of 1.5 conditional on trend. Consistent with Segal and Sullivan (1995), who report that THS employment is highly procyclical, the point estimate indicates that THS employment grew or contracted about 50% faster than overall employment within states on a year-to-year basis.<sup>23</sup> In columns 4–6, I add controls for quadratic state time trends and interactions between year dummies and indicators for each of the nine census regions that allow state THS employment to trend nonlinearly and also absorb region-specific shocks. The implied contract coefficient is largely insensitive to these additional controls.

To explore whether the estimates are driven by demographic changes

<sup>23</sup> One cannot, however, reject that the THS employment–overall employment elasticity is equal to 1.0 at the 5% level. Although the nonfarm employment measure also includes THS employment, THS is a small component (0.2%–2%) of the total, and subtracting it from the nonfarm employment measure has no discernable impact on the point estimates.

**Table 5**  
**The Estimated Impact of the Implied Contract Exception to Employment at Will on THS Employment, 1979–95, Controlling for State Demographics**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Implied contract exception	.148 (.057)	.132 (.063)	.174 (.056)	.141 (.068)	.134 (.077)	.145 (.056)	.141 (.068)
Log of state nonfarm employment	1.55 (.43)	1.59 (.64)	1.44 (.58)	1.66 (.91)	2.01 (.43)	1.67 (.42)	1.77 (.84)
Labor force demographics:							
High school graduates					5.60 (2.16)	.08 (1.23)	.12 (1.24)
Some college					6.38 (2.31)	.94 (1.44)	1.02 (1.26)
College +					.04 (1.88)	-1.46 (1.57)	-1.42 (1.65)
Female					3.09 (2.08)	2.01 (1.35)	1.98 (1.36)
Married					1.33 (3.34)	1.57 (1.80)	2.60 (1.99)
Married and female					-2.44 (6.07)	-3.31 (2.64)	-2.83 (3.15)
Black					-3.19 (1.39)	-2.01 (1.19)	-1.56 (1.09)
Other nonwhite					-.52 (3.69)	-.14 (1.74)	.29 (2.65)
Ages 16–24					1.86 (1.79)	-.89 (1.06)	-.29 (1.39)
Age > 54					.66 (2.31)	.70 (1.31)	-2.73 (1.66)
Other covariates:							
State × time trends	Yes	Yes	Yes	Yes	No	Yes	Yes
Quadratic state × time <sup>2</sup> trends	No	Yes	No	Yes	No	No	Yes
Region by year dummies	No	No	Yes	Yes	No	No	Yes
R <sup>2</sup>	.989	.990	.991	.993	.976	.989	.993

NOTE.—THS = temporary help services. Dependent variable: log state THS employment;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. All models include state and year dummies and dummy variables for public policy and good faith exceptions. Labor force demographics are calculated for state labor force (employed and unemployed) from Current Population Survey merged outgoing rotation groups (MORG) for 1979–95. Omitted reference group is unmarried white, male, high school dropouts ages 25–54.

in the labor force, I include in columns 5–7 detailed state demographic variables that measure the fraction of the labor force in the following groups: high school graduate, some college, and greater than college; female, married, and married and female; black and other race; and age 16–24 and 55 plus.<sup>24</sup> Consistent with the demographics composition of temporary help employment (Cohany 1998), there is a substantial correlation between the growth of THS and increases in the labor-force shares of high school graduates, some-college attendees, and women.<sup>25</sup> Subsequent columns add quadratic time trends and region-by-year dummies. In column 5, the base specification augmented with demographic controls, the estimated impact of the implied contract exception on THS employment is 13.3 log points. The final column yields a point estimate of 14.1 log points, which is stubbornly significant despite the inclusion of approximately 300 covariates.

Estimates of these models that use average state employment as weights are found in appendix table B1. These estimates confirm a significant effect of the implied contract exception on THS growth. In the base specification, column 2, the point estimate is 7.1 log points as compared with 14.8 log points for the unweighted estimate. When labor-force demographics, region-by-year dummies, and quadratic state time trends are included, the point estimate increases to 9.3 log points as compared with 14.1 log points for the unweighted estimate.

#### D. Estimates by Region and Time Period

Because the many court decisions altering the common law provide multiple “experiments,” one can usefully subdivide the data to provide a consistency check on the estimates. Two such tests are discussed here. The top panel of table 6 presents estimates of the baseline model using state-level data subdivided into three 4-year intervals over 1979–91.<sup>26</sup> To alleviate concern about the nonindependence of the outcome variable over short time spans, I estimate the models using observations at 1-, 2-, and 4-year frequencies. The point estimates present a highly consistent picture: the implied contract coefficient is positive in each case and generally in the range of 7–20 log points. Interestingly, the estimated impact of the implied contract exception does not appear smaller for later adopters, suggesting that anticipatory effects are not particularly important. The public policy and good faith exceptions (not tabulated) again present no

<sup>24</sup> The omitted group is white, male, high school dropouts ages 25–54. The labor force sample includes both employed and unemployed workers.

<sup>25</sup> Given the substantial overrepresentation of blacks in temporary help employment (22% of THS vs. 11% of non-THS employment in 1995 [Cohany 1998]), one surprising finding is the negative relationship between the share of a state’s labor force that is black and the level of state THS employment.

<sup>26</sup> No implied contract exceptions were adopted after 1989.

**Table 6**  
**The Estimated Impact of the Implied Contract Exception to Employment at Will on THS Employment by Time Period and Region**

	A. 4-Year Subperiods of 1979–91		
	1-Year Intervals ( <i>n</i> = 250)	2-Year Intervals ( <i>n</i> = 150)	4-Year Intervals ( <i>n</i> = 100)
1979–83	.122 (.088)	.073 (.092)	.034 (.152)
1983–87	.071 (.121)	.199 (.099)	.259 (.141)
1987–91	.145 (.110)	.089 (.047)	.187 (.106)
B. Nine Geographic Divisions, 1979–95			
	New England ( <i>n</i> = 102)	West North Central ( <i>n</i> = 119)	West South Central ( <i>n</i> = 68)
1979–95	.146 (.102)	.116 (.122)	.077 (.137)
	Middle Atlantic ( <i>n</i> = 51)	South Atlantic ( <i>n</i> = 136)	Mountain Division ( <i>n</i> = 136)
1979–95	.000 (.064)	.154 (.071)	.478 (.187)
	East North Central ( <i>n</i> = 85)	East South Central ( <i>n</i> = 68)	Pacific Division ( <i>n</i> = 85)
1979–95	.166 (.110)	.009 (.089)	.057 (.157)

NOTE.—THS = temporary help services. Dependent variable: log state THS employment. Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. Each coefficient is from a separate regression of log state THS employment on a dummy variable equal to one after adoption of an implied contract exception. All models include state and year dummies, a control for the log of state nonfarm unemployment, and dummy variables for public policy and good faith exceptions. The first column of panel A and all models in panel B also include controls for state linear time trends. Note that no implied contract exceptions were adopted after 1991.

clear pattern. In the lower panel of table 6, I provide estimates of the base specification for each of the nine geographic census regions. These estimates are reasonably stable across census regions: positive in eight of nine regions, and in the range of 6–17 log points in six of these.<sup>27</sup>

#### E. Inferring Causality via the Timing of Common Law Changes

The discrete specification above provides no sense of the dynamics of common law adoption and THS employment: how quickly employment

<sup>27</sup> In regressions not tabulated here, I find that there is never a significant cross-sectional relationship between either the log level or the share of employment in a state supplied by THS and the presence of an implied contract exception. Apparently, there are important unmeasured determinants of cross-state THS penetration, which are effectively purged by the fixed-effects model used for the primary analysis.

**Table 7**  
**The Estimated Impact of the Implied Contract Exception to Employment at Will on THS Employment, 1979–95, Controlling for State Demographics**

	(1)	(2)	(3)	(4)
Implied contract leads and lags:				
Law change <sub><i>t</i>+2</sub>	.030 (.066)	-.017 (.052)	-.015 (.053)	.039 (.048)
Law change <sub><i>t</i>+1</sub>	.025 (.065)	-.001 (.058)	.000 (.080)	.054 (.080)
Law change <sub><i>t</i>0</sub>	.120 (.091)	.108 (.080)	.108 (.096)	.158 (.092)
Law change <sub><i>t</i>-1</sub>	.121 (.109)	.147 (.085)	.146 (.115)	.204 (.117)
Law change <sub><i>t</i>-2</sub>	.168 (.130)	.228 (.104)	.224 (.134)	.296 (.134)
Law change <sub><i>t</i>-3</sub>	.084 (.139)	.144 (.107)	.144 (.135)	.192 (.137)
Implied contract law <sub><i>t</i>-4 forward</sub>	.100 (.175)	.196 (.125)	.222 (.153)	.255 (.162)
Other covariates:				
State × time trends	No	Yes	Yes	Yes
State × time <sup>2</sup> trends	No	No	Yes	Yes
Region × year dummies	No	No	No	Yes
H <sub>0</sub> : adoption <sub><i>t</i>(0-t4)</sub> = 0	.46	.27	.35	.23
R <sup>2</sup>	.973	.989	.991	.993

NOTE.—THS = temporary help services. Dependent variable: log state THS employment;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. All models include state and year dummies, a control for log state nonfarm employment, and leads and lags of adoption of the public policy and good faith exceptions. Law change dummies  $t_{+2} - t_{-3}$  are equal to one in only 1 year each per adopting state. Implied Contract<sub>*t*-4 forward</sub> dummy is equal to one in every year beginning with the fourth year after adoption.

grows after an exception is adopted and whether this impact accelerates, stabilizes, or mean reverts. If temporary help employment growth leads to the adoption of exceptions rather than vice versa, the previous estimates would obscure this reverse causality. To explore these dynamics, table 7 provides estimates of a subset of the models in table 5, augmented with leads and lags of the implied contract exception. Specifically, I add indicator variables for 1 and 2 years before adoption, years 0–3 after adoption, and year 4 forward. Of these seven indicator variables, note that the first six are equal to one only in the relevant year, while the final variable is equal to one in each year, starting with the fourth year of adoption.

The first column of table 7 presents the base specification augmented with the leads and lags. The coefficients on the adoption leads are close to zero, showing little evidence of an anticipatory response within states about to adopt an exception.<sup>28</sup> In the year of adoption, temporary help employment increases substantially by 12 log points, after which this

<sup>28</sup> This finding should be distinguished from the hypothesis that employers in all states increased their demand for THS as an anticipatory response to common law changes. This latter phenomenon would not be detected by preadoption dummies unless employers foresaw individual court decisions in their own states.

increment fluctuates at between 8 and 17 log points over the subsequent 3 years; then it averages 10 log points in year 4 forward. Subsequent columns repeat these estimates, adding linear and quadratic time trends and region-by-year effects. The pattern of coefficients is comparable in each case, providing robust evidence that adoption of the implied contract exception led the growth of THS rather than vice versa. In the preferred specification that includes linear state trends (col. 2), the estimated impact is 19.6 log points at year 4. This pattern is depicted by figure 3.

In results not tabulated here, I have explored more complex dynamics by allowing the common law exceptions to take a linear or quadratic time slope and including additional years of indicator variables. The data reject these more complex specifications in favor of those found in table 7. I find no evidence of an accumulating impact on THS employment beyond 4 years, nor is there evidence of mean revision in the longer term. It thus appears that the extent of the dynamics of the THS demand response to adoption of the implied contract exception is resolved within 4 years. Note, however, that since THS expanded rapidly throughout this time, a constant impact of 13–20 log points (~ 14–22 percentage points) implies a growing absolute effect on THS employment.<sup>29</sup>

Two further observations on this pattern of results deserve mention. First, the quite rapid growth of THS employment after the adoption of an implied contract exception—on the order of 10% in the year of a ruling—may appear implausibly large. Note, however, that THS is an industry characterized by extremely high flows. For example, Segal and Sullivan (1997*b*) estimate that 60% of THS workers leave the industry within 1 calendar quarter. A substantial change in the scale of the industry therefore requires only that the exit rate decreases slightly (e.g., assignments lengthen) or that intake accelerates.

A second issue is whether, contrary to the estimates above, one should expect the “steady state” impact of a common law change on THS to be more substantial than the near-term impact. The stylized model in Section II suggests that the degree to which firms outsource employment in response to the legal environment is circumscribed by the “technology” of jobs ( $\gamma$  specifically), in particular how much outsourcing reduces productivity relative to termination costs. More generally, it seems likely that firms facing added legal risks will alter their occupational technology to make outsourcing less costly, perhaps by shifting the mix of human capital from specific toward general skills (e.g., using off-the-shelf instead of custom software) or learning to manage outsourced workers more effectively. Logically, the temporary help industry has striven to assist this

<sup>29</sup> Models that control for the fraction of neighboring states and the fraction of states in the same census region recognizing an implied contract exception show no evidence of geographically localized spillovers from the common law changes.

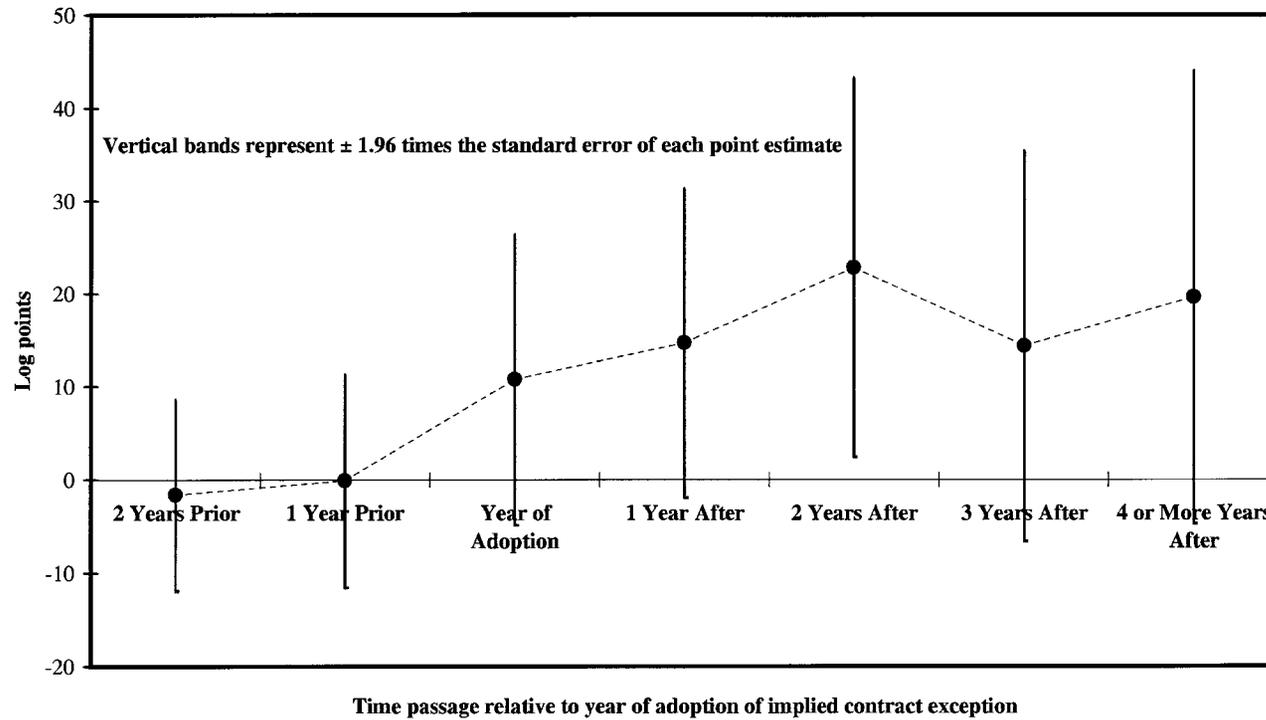


FIG. 3.—Estimated impact of implied contract exception on log state temporary help supply industry employment for years before, during, and after adoption, 1979–95.

effort by developing a sophisticated capacity for training and screening workers (Autor 2001). Unfortunately, the present empirical framework is unable to detect any richer interplay between the legal environment and the growth of outsourcing since these practices will diffuse slowly and potentially affect all states simultaneously.

#### F. Unionization and the Growth of Temporary Help Employment

A potentially complementary explanation for the recent growth of outsourcing in the United States is the changing role of labor unions. Unionized workers have traditionally received greater employment protections than those provided by the at-will doctrine, and it is therefore sensible to ask whether the recent decline of unionization has played a role in the erosion of employment at will and the growth of temporary help. Unions might affect the development of temporary help either indirectly, by influencing the adoption of unjust dismissal doctrines, or directly, by either retarding or contributing to employers' demand for THS workers.

To explore these possibilities, I first estimated probability models in a state-by-time panel to explore whether states where union penetration was growing or declining relatively faster were more likely to adopt common law exceptions. I found no evidence to support this notion, and these results are not tabulated.<sup>30</sup> I next estimated models of log THS employment comparable with those in table 5, which control for the percentage of the state workforce that is unionized. These estimates, found in table 8, provide surprisingly robust evidence that union penetration affects temporary help employment.

The initial column of table 8 presents a model of log state THS employment controlling only for state union penetration and state and year dummies. The union coefficient of 0.026 implies that for every percentage-point increase in unionization, THS employment grows by 2.6 log points. Inclusion of state linear time trends reduces this coefficient to 0.016, which remains highly significant. Subsequent columns add controls for the adoption of the implied contract exception, the log of state nonfarm employment, and a full set of trends, region-by-year effects, and labor-force demographics. Additionally, because of the concern that state unionization level might proxy for the presence of manufacturing, which is a substantial user of temporary help workers (Estavao and Lach 1999), column 2 adds controls for employment composition in 12 major industries. The union

<sup>30</sup> Miles (2000) also reports that state unionization levels have no impact on the expected time duration until a state adopts a common law exception.

**Table 8**  
**Union Penetration, the Implied Contract Exception to Employment at Will and State THS Employment, 1979–95**

	(1)	(2)	(3)	(4)	(5)	(6)
State workforce unionized (%)	.026 (.011)	.016 (.007)	.016 (.007)	.013 (.007)	.014 (.007)	.014 (.007)
Implied contract exception			.132 (.062)	.143 (.057)	.142 (.056)	.129 (.064)
Log of state nonfarm employment				1.52 (.42)	1.06 (.61)	1.36 (.90)
State × time trends	No	Yes	Yes	Yes	Yes	Yes
Industry composition controls	No	Yes	No	No	Yes	Yes
State × time <sup>2</sup> trends	No	No	No	No	No	Yes
Region by year dummies	No	No	No	No	No	Yes
Labor force demographics	No	No	No	No	No	Yes
R <sup>2</sup>	.969	.988	.987	.989	.989	.993

NOTE.—THS = temporary help services;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. State fraction unionized measures are from Hirsch et al. (2001). All models also include state and year dummies and dummies for public policy and good faith exceptions. Labor force demographics (col. 6) are as in table 5. Models in cols. 2, 5, and 6 include controls for the fraction of the state labor force in each of 12 major industries estimated from the Current Population Survey Merged Outgoing Rotation Groups (MORG) files.

impact on THS employment remains significantly positive and in the range of 1.5 log points.<sup>31</sup>

In interpreting the THS-unionization relationship, two points should be kept in mind. First, union penetration fell substantially over this time period, from 22% to 14% in the data, and hence unionization does not contribute to an explanation for the recent growth of THS. Instead, the estimates are best read as indicating that temporary help grew relatively faster in states where unions declined more slowly. Second, unlike the case of the implied contract doctrine, the unionization estimates do not have a clear causal interpretation since union penetration cannot be viewed as exogenous. The relationship is nevertheless suggestive and provides an empirical underpinning for the visible enmity between THS employers and U.S. labor unions (cf. Carré, duRivage, and Tilly 1994; Lips 1998). One interpretation of this finding is that employers in highly unionized states use temporary help to avoid union constraints on wages or man-

<sup>31</sup> An interaction between the level of unionization and a dummy for the implied contract exception was small and insignificant.

agement practices. An alternative and probably less viable reading is that high levels of THS employment contribute to workers' demands for union representation.

#### G. Impact of the Decline of Employment at Will on Other Business Services Employment

Although temporary help grew substantially faster than other forms of outsourced employment, non-THS business service employment (such as janitorial services and computer and data processing) also experienced rapid growth between 1979 and 1995, rising from 2.1% to 3.6% of employment (excluding THS). It is natural to ask whether the erosion of employment at will contributed to this phenomenon as well. To explore this question, I estimate log employment models as in table 8 for each of the business service industries. Before proceeding to these estimates, I note that the legal analysis above indicates that the adoption of unjust dismissal doctrines would not directly contribute to the growth of other business services since, unlike THS, these industries are not directly advantaged by these doctrines. Hence, these results may be viewed as a falsification test of the earlier findings.

Estimates in table 9 give little indication that the adoption of the implied contract doctrine contributed to the growth of other business service employment. Except for those subcomponents of business services that contain temporary help (table 9, rows 1 and 10), the estimates are primarily insignificant and do not have consistent signs. Results for the impacts of the public policy and good faith doctrines (not tabulated) and the unionization variable also present no consistent pattern.

### V. Conclusions

To summarize the primary findings, figure 4 depicts the time series of states adopting the implied contract exception alongside estimates of temporary help employment for 1979–95, both before and after conditioning on the adoption of the implied contract exception. A fourth line on this plot indicates the share of the growth of temporary help since 1973 explained by changes to the at-will doctrine. The estimates indicate that as of 1995, 306,000 additional workers were employed in temporary help on a daily basis as a result of the implied contract exception.

Extending this estimate forward and using the weighted and unweighted point estimates to form bounds, I find that 361,000–530,000 additional workers were employed in temporary help as of the year 2000 because of the implied contract exception.<sup>32</sup> As the lower line of figure 4 indicates,

<sup>32</sup> As of 1995, the most recent year for which state level estimates are available, 75.6% of THS employment was in states that had adopted an implied contract exception. Assuming this ratio continued to hold as of 2000, when national THS

**Table 9**  
**The Implied Contract Exception to Employment at Will, Union Penetration, and Employment in the Business Services Sector, 1980–95**

	Implied Contract Exception	State % Unionized	Log of State Nonfarm Employment	R <sup>2</sup>	Mean (SD) % of State Employment
1. All business services (SIC 7300)	.012 (.014)	-.0054 (.0054)	1.35 (.12)	.996	4.20 (1.23)
2. Business services except personnel supply	-.015 (.017)	-.010 (.009)	1.19 (.18)	.993	3.02 (.90)
3. Advertising (SIC 7310)	.059 (.042)	.0090 (.0051)	.98 (.36)	.991	.16 (.09)
4. Credit reporting and collecting (SIC 7320)	-.025 (.033)	-.0005 (.0043)	.60 (.29)	.986	.10 (.03)
5. Mailing, reproduction, and stenographic (SIC 7330)	-.011 (.047)	.0014 (.0075)	.96 (.27)	.990	.18 (.09)
6. Services to buildings (SIC 7340)	-.030 (.027)	.0023 (.0036)	1.07 (.25)	.995	.74 (.23)
7. Equipment rental and leasing (SIC 7350)	.019 (.038)	.0014 (.0050)	2.30 (.31)	.987	.21 (.09)
8. Computer and data processing services (SIC 7370)	.023 (.039)	-.0107 (.0047)	1.46 (.42)	.992	.59 (.40)
9. Miscellaneous business services (SIC 7380)	-.005 (.023)	-.0018 (.0048)	1.41 (.20)	.993	.99 (.31)
10. Personnel supply services (SIC 7360, includes THS)	.105 (.047)	.0072 (.0063)	1.87 (.35)	.989	1.18 (.45)

SOURCE.—For business services employment, see County Business Patterns (various years).

NOTE.—SIC = standard industrial classification; THS = temporary help services. Dependent variable is log state employment in business services and its subsectors;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. Estimates include state and year dummies, state linear time trends, and dummies for public policy and good faith exceptions. State fraction unionized are from Hirsch et al. (2001). Business services employment counts are adjusted for compatibility between the 1977 and 1987 SIC standards.

the estimates explain as much 20% of the growth of temporary help services employment over the 23-year period from 1973 to 1995. Observe, however, that the explanatory power of the model actually falls in the recent period since temporary help has continued to expand rapidly since 1992, several years after the most recent implied contract exception was adopted. Hence, the present analysis provides a starting point for understanding the recent dramatic growth of THS specifically and outsourcing more generally but is not a complete account.

employment was equal to 3,887 thousand, the total employment estimated impact is  $3,887 \times 0.756/[i/(1+i)]$ , where  $i$  is equal to either 0.14 (weighted estimate) or 0.22 (unweighted estimate).

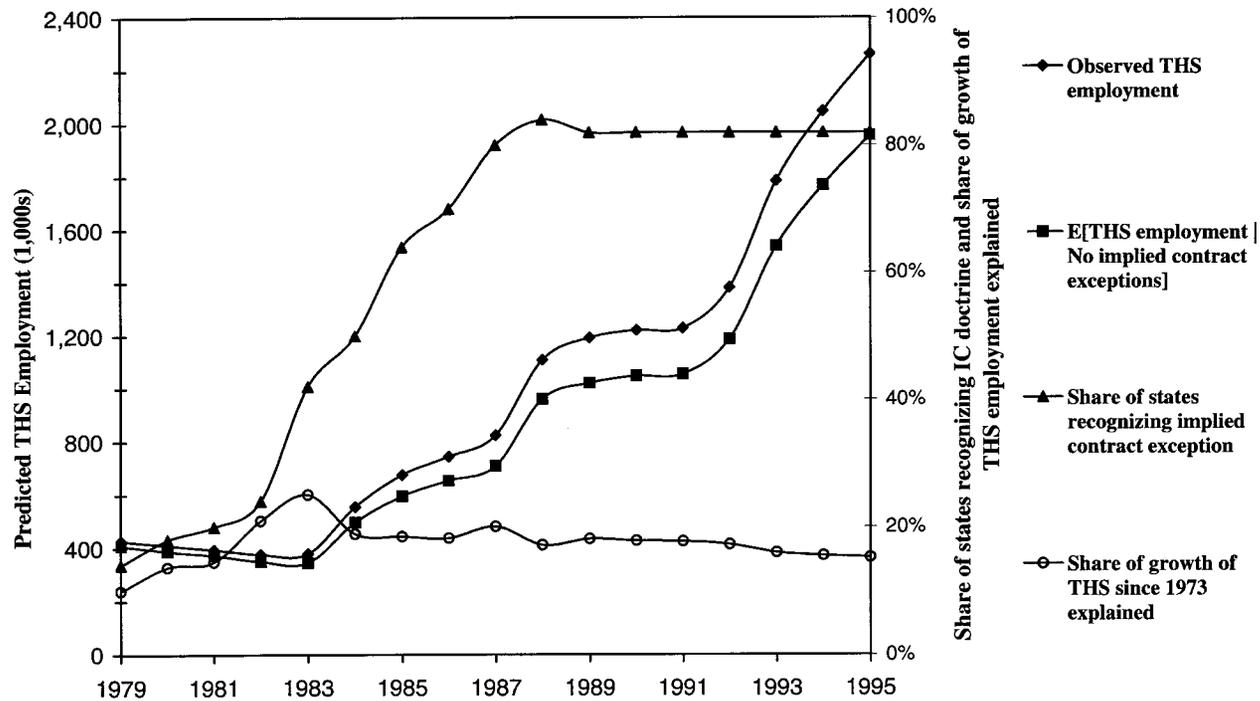


FIG. 4.—Predicted state temporary help supply industry employment, 1979–95, conditioning on adoption of implied contract exceptions

There is an irony to the findings of this research—namely, that labor-market interventions intended to protect or expand workers’ employment “rights” appear to have had unintended and potentially perverse consequences. Acemoglu and Angrist (2001) and DeLeire (2000) conclude that the Americans with Disabilities Act reduced the employment of the disabled, while Oyer and Schaefer (2000, 2002) present evidence that the Civil Rights Act of 1991 increased firms’ use of mass layoffs as a shield for the firing of black men and raised the earnings of experienced workers relative to the young. In a similar vein, the current research suggests that courts’ efforts to protect workers against unjust dismissal have fostered the growth of temporary help employment—nonpreferred jobs that offer less job security and lower pay than standard positions. Moreover, there is some evidence that labor unions, which have historically provided employment protection to their members, also induce employment outsourcing to temporary help.

It should be stressed, however, that the welfare impacts of the decline of employment at will are indeterminate based on the present evidence. While the current analysis explores one margin of response to the changing legal doctrines, it offers no evidence on the compensatory benefits that workers may have received by dint of these laws. Theory also suggests that some legal restrictions on private contracting can enhance efficiency (Aghion and Hermalin 1990; Levine 1991). Whether workers were in net harmed by these well-meaning judicial efforts—and if so, which groups of workers have borne the greatest burden—is a question open to research.

## Appendix A

### Legal Appendix

**Table A1**  
**Cases and Statutes Used for the Analysis**

State	Public Policy	Implied Contract	Implied Covenant
Alabama		<i>Hoffman-La Roche, Inc. v. Campbell</i> (7/10/87) 512 So. 2d 725, 728–29 (Ala. 1987)	<i>Hoffman-La Roche, Inc. v. Campbell</i> (7/10/87) 512 So. 2d 725, 728–29 (Ala. 1987)
Alaska	<i>Knight v. American Guard &amp; Alert, Inc.</i> (2/21/86) 714 P.2d 788 (Alaska 1986)	<i>Eales v. Tanana Valley Medical-Surgical Group</i> (5/27/83) 663 P.2d 958 (Alaska 1983)	<i>Mitford v. de Lasala</i> (5/20/83) 666 P.2d 1000 (Alaska 1983).
Arizona	<i>Wagenseller v. Scottsdale Memorial Hospital</i> (6/17/85) 710 P.2d 1025 (Ariz. 1985)	<i>Leikvold v. Valley View Community Hospital</i> (6/14/83) 688 P.2d 201 (Ariz. App. 1983), vacated (4/25/84) 688 P.2d 170 (Ariz. 1984).	<i>Wagenseller v. Scottsdale Memorial Hospital</i> (6/17/85) 710 P.2d 1025 (Ariz. 1985)
Arkansas	<i>M.B.M Co. v. Counce</i> (3/24/80) 596 S.W.2d 681 (Ark. 1980)	<i>Jackson v. Kinark Corp.</i> (6/4/84) 669 S.W.2d 898 (Ark. 1984)	
California	<i>Petermann v. International Brotherhood of Teamsters, Chauffeurs, Warehouseman &amp; Helpers of America, Local 396</i> (9/30/59) 344 P.2d 25 (Cal. Ct. App. 1959)	<i>Rabago-Alvarez v. Dart Industries</i> (2/6/76) 127 Cal. Rptr. 222 (Cal. Ct. App. 1976)	<i>Cleary v. American Airlines, Inc.</i> (10/29/80) 168 Cal. Rptr. 722 (Cal. Ct. App. 1980); modified to remove tort damages by <i>Foley v. Interactive Data Corp.</i> (12/29/88) 765 P.2d 373 (Cal 1988)
Colorado	<i>Winther v. DEC International, Inc.</i> (9/18/65) 625 F. Supp. 100 (D. Colo. 1985)	<i>Brooks v. Trans World Airlines</i> (10/18/83) 574 F. Supp. 805 (D. Colo. 1983)	
Connecticut	<i>Sheets v. Teddy's Frosted Foods, Inc.</i> (1/22/80) 427 A.2d 385 (Conn. 1980)	<i>Finley v. Aetna Life &amp; Casualty Co.</i> (10/1/85) 499 A.2d 64 (Conn. App. Ct. 1985) reversed 1/27/87 520 A.2d 208 (Conn. 1987). (But note that implied contract exception was upheld despite reversal of verdict.)	<i>Magnan v. Anaconda Industries</i> (6/10/80) 429 A.2d 492 (Conn. Super. Ct. 1980) reversed and remanded on other grounds (7/38/84) 479 A.2d 781 (Conn. 1984). (But note that implied covenant exception was upheld.)

Table A1 (Continued)

State	Public Policy	Implied Contract	Implied Covenant
Delaware			<i>Merrill v. Crothall-American, Inc.</i> (4/21/92) 606 A.2d 96, 7 IER Cases 781 (Del SupCt 1992)
Florida			
Georgia			
Hawaii	<i>Parna v. Americana Hotels, Inc.</i> (10/28/82) 652 P.2d 625 (Haw. 1982)	<i>Kinoshita v. Canadian Pacific Airlines</i> (8/ 26/86) 724 P.2d 100 (Haw. 1986)	
Idaho	<i>Jackson v. Minidoka Irrigation District</i> (4/ 21/77) 563 P.2d 54 (Idaho 1977)	<i>Jackson v. Minidoka Irrigation District</i> (4/ 21/77) 563 P.2d 54 (Idaho 1977)	<i>Metcalf v. Intermountain Gas Co.</i> (8/8/89) 778 P.2d 744 (Idaho 1989).
Illinois	<i>Kelsay v. Motorola, Inc.</i> (12/4/78) 384 N.E.2d 353 (Ill. 1978)	<i>Carter v. Kaskaskia Community Action Agency</i> (12/20/74) 322 N.E.2d 574 (Ill. App. Ct. 1974)	
Indiana	<i>Frampton v. Central Indiana Gas</i> (5/1/73) 297 N.E.2d 425 (Ind. 1973)	<i>Romack v. Public Service Co. of Indiana</i> (8/20/87) 511 N.E.2d 1024 (Ind. 1987).	
Iowa	<i>Northrup v. Farmland Industries, Inc.</i> (7/ 31/85) 372 N.W.2d 193 (Iowa 1985)	<i>Young v. Cedar County Work Activity Ctr., Inc.</i> (11/5/87) 418 N.W.2d 844 (Iowa 1987)	
Kansas	<i>Murphy v. City of Topeka-Shawnee County Department of Labor Services</i> (6/19/81) 630 P.2d 186 (Kan. Ct. App. 1981)	<i>Allegrri v. Providence-St. Margaret Health Center</i> (8/2/84) 684 P.2d 1031 (Kan. Ct. App. 1984)	
Kentucky	<i>Firestone Textile Co. v. Meadows</i> (11/23/83) 666 S.W.2d 730 (Ky. 1983).	<i>Shah v. American Synthetic Rubber Co.</i> (8/ 31/83) 655 S.W.2d 489 (Ky. 1983)	
Louisiana			
Maine		<i>Terrio v. Millinocket Community Hospital</i> (11/2/77) 379 A.2d 135 (Me. 1977)	
Maryland	<i>Adler v. American Standard Corp.</i> (7/16/81) 432 A.2d 464 (Md. 1981)	<i>Staggs v. Blue Cross of Maryland, Inc.</i> (1/ 14/85) 486 A.2d 798 (Md. Ct. Spec. App. 1985) cert. denied, 493 A.2d 349 (Md. 1985)	
Massachusetts	<i>McKinney v. National Dairy Council</i> (5/28/ 80) 491 F. Supp. 1108 (D. Mass. 1980)	<i>Hobson v. McLean Hospital Corp.</i> (5/16/ 88) 522 N.E.2d 975 (Mass. 1988)	<i>Fortune v. National Cash Register Co.</i> (7/ 20/77) 364 N.E.2d 1251 (Mass. 1977)

	Michigan	<i>Sventko v. Kroger Co.</i> (6/24/76) 245 N.W.2d 151 (Mich. 1976)	<i>Toussaint v. Blue Cross and Blue Shield of Michigan</i> (6/10/80) 292 N.W.2d. 880 (Mich. 1980)	
	Minnesota	<i>Phipps v. Clark Oil &amp; Refining Co.</i> (11/18/86) 396 N.W.2d 588 (Minn. Ct. App. 1986), <i>aff'd</i> 408. N.W.2d 569 (Minn. 1987)	<i>Pine River State Bank v. Mettelle</i> (4/29/83) 333 N.W.2d 622 (Minn. 1983)	
	Mississippi	<i>Laws v. Aetna Finance Co.</i> (7/17/87) 667 F. Supp. 342 (N.D. Miss. 1987)		
	Missouri	<i>Boyle v. Vista Eyewear, Inc.</i> (11/5/85) 700 S.W.2d 859 (Mo. Ct. App. 1985)	<i>Arie v. Intertherm, Inc.</i> (1/18/83) 648 S.W.2d 142 (Mo. Ct. App. 1983); this precedent was overturned by <i>Johnson v. McDonnell Douglas Corporation</i> (2/17/88) 745 S.W.2d 661 (Mo. Sup. Ct. 1988)	
	Montana	<i>Keneally v. Orgain</i> (1/30/80) 606 P.2d 127 (Mont. 1980)	<i>Montana Wrongful Discharge from Employment Act</i> (1/1/87) Mont. Code Ann. 39-2-901 to §§ 39-2-914 (1987)	<i>Gates v. Life of Montana Insurance Co.</i> (1/5/82) 638 P.2d 1063 (Mont. 1982).
35	Nebraska	<i>Ambroz v. Cornhusker Square Ltd.</i> (11/25/87) 416 N.W.2d 510 (Neb. 1987)	<i>Morris v. Lutheran Medical Center</i> (11/18/83) 340 N.W.2d 388 (Neb. 1983)	
	Nevada	<i>Hansen v. Harrab's</i> (1/25/84) 675 P.2d 394 (Nev. 1984)	<i>Southwest Gas Corp. v. Ahmad</i> (831/83) 668 P.2d 261 (Nev. 1983)	<i>K-Mart Corp. v. Ponsock</i> (2/24/87) 732 P.2d 1364 (Nev. 1987)
	New Hampshire	<i>Monge v. Beebe Rubber Co.</i> (2/28/74) 316 A.2d 549 (N.H. 1974)	<i>Panto v. Moore Business Forms, Inc.</i> (8/5/88) 547 A.2d 260 (N.H. 1988)	<i>Monge v. Beebe Rubber Co.</i> (2/28/74) 316 A.2d 549 (N.H. 1974)
	New Jersey	<i>Pierce v. Ortho Pharmaceutical Corp.</i> (7/28/80) 417 A.2d 505 (N.J. 1980)	<i>Woolley v. Hoffman-La Roche Inc.</i> (5/9/85) 491 A.2d 1257 (N.J. 1985) <i>modified</i> , 499 A.2d 515 (N.J. 1985)	
	New Mexico	<i>Vigil v. Arzola</i> (7/5/83) 699 P.2d 613 (N.M. Ct. App. 1983) <i>rev'd</i> , 687 P.2d 1038 (N.M. 1984)	<i>Forrester v. Parker</i> (2/1/80) 606 P.2d 191 (N.M. 1980)	
	New York		<i>Weiner v. McGraw-Hill, Inc.</i> (11/18/82) 443 N.E.2d 441 (N.Y. 1982)	
	North Carolina	<i>Sides v. Duke Hospital</i> (5/7/85) 328 S.E.2d 818 (N.C. Ct. App. 1985)		

Table A1 (Continued)

State	Public Policy	Implied Contract	Implied Covenant
North Dakota	<i>Krein v. Marian Manor Nursing Home</i> (11/19/87) 415 N.W.2d 793 (N.D. 1987)	<i>Hammond v. North Dakota State Personnel Board</i> (2/23/84) 345 N.W.2d 359 (N.D. 1984)	
Ohio	<i>Goodspeed v. Airborne Express, Inc.</i> (2/11/85) 121 L.R.R.M. (BNA) 3216 (Ohio Ct. App. 1985); precedent reversed by <i>Phung v. Waste Management, Inc.</i> (4/16/86) N.E.2d 1114 (Ohio 1986)	<i>West v. Roadway Express</i> (3/21/82) 115 L.R.R.M. (BNA) 4553 (Ohio Ct. App. 1982), <i>cert. denied</i> , 459 U.S. 1205 (1983)	
Oklahoma	<i>Burke v. K-Mark Corp</i> (2/7/89) 770 P.2d 24 (Okla. 1989)	<i>Langdon v. Saga Corp.</i> (12/28/76) 569 P.2d 524 (Okla. Ct. App. 1976)	<i>Hall v. Farmers Insurance Exchange</i> (5/21/85) 713 P.2d 1027 (Okla. 1985); precedent reversed by <i>Hinson v. Cameron</i> (6/9/87) 742 P.2d 549 (Okla. 1987)
Oregon	<i>Nees v. Hocks</i> (6/12/75) 536 P.2d 512 (Or. 1975)	<i>Yartzoff v. Democrat-Herald Publishing Co.</i> (3/28/78) 576 P.2d 356 (Or. 1978)	
Pennsylvania	<i>Geary v. United States Steel Corp.</i> (3/25/74) 319 A.2d 174 (Pa. 1974)		
Rhode Island			
South Carolina	<i>Ludwick v. This Minute of Carolina, Inc.</i> (11/18/85) 337 S.E.2d 213 (S.C. 1985)	<i>Small v. Springs Industries, Inc.</i> (6/8/87) 357 S.E.2d 452 (S.C. 1987)	
South Dakota	<i>Johnson v. Kreiser's Inc.</i> (12/7/88) 433 N.W.2d 225 (S.D. 1988)	<i>Osterkamp v. Alkota Manufacturing, Inc.</i> (4/13/83) 332 N.W.2d 275 (S.D. 1983)	
Tennessee	<i>Clanton v. Cain-Sloan Co.</i> (8/20/84) 677 S.W.2d 441 (Tenn. 1984)	<i>Hamby v. Genesco, Inc.</i> (11/5/81) 627 S.W.2d 373 (Tenn. Ct. App. 1981)	
Texas	<i>Hauck v. Sabine Pilots, Inc.</i> (6/7/84) 672 S.W.2d (Tex. Civ. App.-Beaumont 1984), <i>aff'd sub nom. Sabine Pilot Serv., Inc. v. Hauck</i> , 687 S.W.2d 733 (Tex. 1985)	<i>Johnson v. Ford Motor Co.</i> (4/11/85) 690 S.W.2d 90 (Tex. Civ. App.-Eastland 1985, writ ref'd n.r.e.)	
Utah	<i>Berrube v. Fashion Centre, Ltd.</i> (3/20/89) 771 P.2d 1033 (Utah 1989)	<i>Rose v. Allied Development Co.</i> (5/13/86) 719 P.2d 83 (Utah 1986)	
Vermont	<i>Payne v. Rozendaal</i> (9/26/86) 520 A.2d 586 (Vt. 1986)	<i>Sherman v. Rutland Hospital, Inc.</i> (8/9/85) 500 A.2d 230 (Vt. 1985)	

Virginia	<i>Bowman v. State Bank of Keysville</i> (6/14/85) 331 S.E.2d 797 (Va. 1985)	<i>Frazier v. Colonial Williamsburg Foundation</i> (9/9/83) 574 F. Supp. 318 (E.D. Va. 1983)	
Washington	<i>Thompson v. St. Regis Paper Co.</i> (7/5/84) 685 P.2d 1081 (Wash. 1984)	<i>Roberts v. Atlantic Richfield Co.</i> (8/18/77) 568 P.2d 764 (Wash. 1977)	
West Virginia	<i>Harless v. First National Bank</i> (7/14/78) 246 S.E.2d 270 (W. Va. 1978)	<i>Cook v. Heck's Inc.</i> (4/4/86) 342 S.E.2d 453 (W. Va. 1986)	
Wisconsin	<i>Ward v. Frito-Lay, Inc.</i> (1/28/80) 290 N.W.2d 536 (Wis. Ct. App. 1980)	<i>Ferraro v. Koelsch</i> (6/5/85) 368 N.W.2d 666 (Wis. 1985)	
Wyoming	<i>Griess v. Consolidated Freightways</i> (7/5/89) 776 P.2d 752 (Wyo. 1989)	<i>Mobil Coal Producing Inc. v. Parks</i> (8/13/85) 704 P.2d 702 (Wyo. 1985)	<i>Wilder v. Cody City Chamber of Commerce</i> (01/25/94) 868 P.2d 211 (Wyo. 1994)

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NOTE.—Blank entries in the table indicate that no exception was recognized in the relevant state and category.

## Appendix B

**Table B1**  
**The Estimated Impact of the Implied Contract Exception to Employment at Will on THS Employment, 1979–95, Weighted by State Employment Shares**

	(1)	(2)	(3)	(4)	(5)
Implied contract exception	.071 (.038)	.069 (.040)	.099 (.034)	.085 (.039)	.093 (.039)
Other covariates:					
State × time trends	Yes	Yes	Yes	Yes	Yes
State × time <sup>2</sup> trends	No	Yes	No	Yes	Yes
Region by year dummies	No	No	Yes	Yes	Yes
Labor force demographics	No	No	No	No	Yes
$R^2$	.991	.993	.994	.995	.995

NOTE.—THS = temporary help services. Dependent variable: log state THS employment;  $n = 850$ . Ordinary least squares estimates given. Huber-White robust SEs in parentheses allow for arbitrary correlation of residuals within each state. Estimates weighted by mean state share of national employment over 1979–95. All models include dummy variables for public policy and good faith common law exceptions, state and year dummies, and state linear time trends. Labor force demographics in col. 5 are as in table 5.

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June 29, 2015

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## EXECUTIVE SUMMARY

- Puerto Rico faces hard times. Structural problems, economic shocks and weak public finances have yielded a decade of stagnation, outmigration and debt. Financial markets once looked past these realities but have since cut off the Commonwealth from normal market access. A crisis looms.
- For its part, the administration has worked hard to stave off a financing crisis with important measures since 2013, including higher taxes, pension reforms and spending cuts. However, as much as these are needed, much remains to be done to build on this progress. Given the economic downdrafts, the coming years will be difficult. But it is within the power of this government, which has repeatedly demonstrated a willingness to act, to set the economy on a sustainable path.
- Puerto Rico has advantages it can parlay into market confidence and durable growth if decades-old policy failings are fully addressed. The debt cannot be made sustainable without growth, nor can growth occur in the face of structural obstacles and doubts about debt sustainability. The strategy here is an integrated package, indicative of the scope and order of magnitude of needed policies:
  - *Structural reforms.* Restoring growth requires restoring competitiveness. Key here is local and federal action to lower labor costs gradually and encourage employment (minimum wage, labor laws, and welfare reform), and to cut the very high cost of electricity and transportation (Jones Act). Local laws that raise input costs should be liberalized and obstacles to the ease of doing business removed. Public enterprise reform is also crucial.
  - *Fiscal reform and public debt.* Probably the most startling finding in this report will be that the true fiscal deficit is much larger than assumed. Even a major fiscal effort leaves residual financing gaps in coming years, which can be bridged by debt restructuring (a voluntary exchange of existing bonds for new ones with a longer/lower debt service profile). Public enterprises too face financial challenges and are in discussions with their creditors. Despite legal complexities, *all* discussions with creditors should be coordinated.
  - *Institutional credibility.* The legacy of weak budget execution and opaque data – our fiscal analysis entailed many iterations – must be overcome. Priorities include legislative approval of a multi-year fiscal adjustment plan, legislative rules on deficits, a fiscal oversight board, and more reliable and timely data.
- This is a daunting agenda politically, legally, and organizationally. It is also an urgent one: the government's cash balances can evaporate in the face of delays, reducing the room for maneuver and intensifying the crisis.

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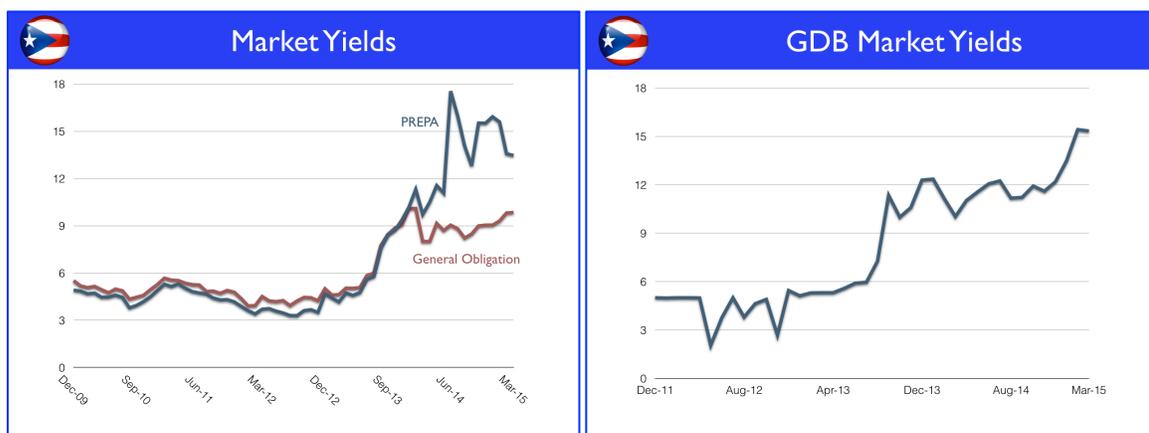
**DISCLAIMER.** This report was prepared at the request of legal counsel, and is for discussion purposes only. It is based on publicly available information, as well as reports and discussions with experts engaged by the Commonwealth of Puerto Rico (the “Commonwealth”), the Government Development Bank for Puerto Rico (“GDB”), and certain other government instrumentalities of the Commonwealth. The information contained in this report has not been reviewed by any auditors (independent or otherwise), nor have such auditors been consulted. The authors of this report have made no independent verification as to the accuracy or completeness of the information contained herein, and they assume no responsibility for independently verifying the information contained herein. Accordingly, they make no representation or warranty as to the accuracy, completeness, or reasonableness of the information herein, and this report, including any analysis or description of any possible recommended measures, is subject to reconsideration and modification at any time. ♦ The description of potential fiscal or structural measures set forth herein is not exhaustive, nor should it be viewed as an unqualified recommendation or endorsement of any specific measure, and that there may be compelling policy and other reasons not to adopt such recommendations. The authors acknowledge that any specific recommendation may be impractical or impossible to implement for a variety of reasons and that the authors do not possess all of the information that may be relevant to the consideration of any specific measure. Any statements contained in this report, whether forward-looking or historical, are not guarantees of future performance and involve certain risks, uncertainties, estimates and assumptions made in this report. The economic and financial condition of the Commonwealth and its instrumentalities is affected by various financial, social, economic, environmental, and political factors. These factors can be very complex, may vary from one fiscal year to the next, and are frequently the result of actions taken or not taken, not only by the Commonwealth and its agencies and instrumentalities, but also by entities such as the government of the United States. Because of the uncertainty and unpredictability of these factors, their impact cannot be included in assumptions in this report. Future events and actual results may differ materially from any estimates, projections or statements contained herein. ♦ Nothing in this report should be considered as an express or implied commitment to do or take, or to refrain from taking, any action by the Commonwealth, the GDB or any government instrumentality in the Commonwealth. Nothing in this report shall be considered a solicitation, recommendation or advice to any person to participate, pursue or support a particular course of action or transaction, to purchase or sell any security, or to make any investment decision. Nothing contained herein may be used or offered into evidence in any legal, administrative or other proceeding.

## I. THE CRISIS OF CONFIDENCE

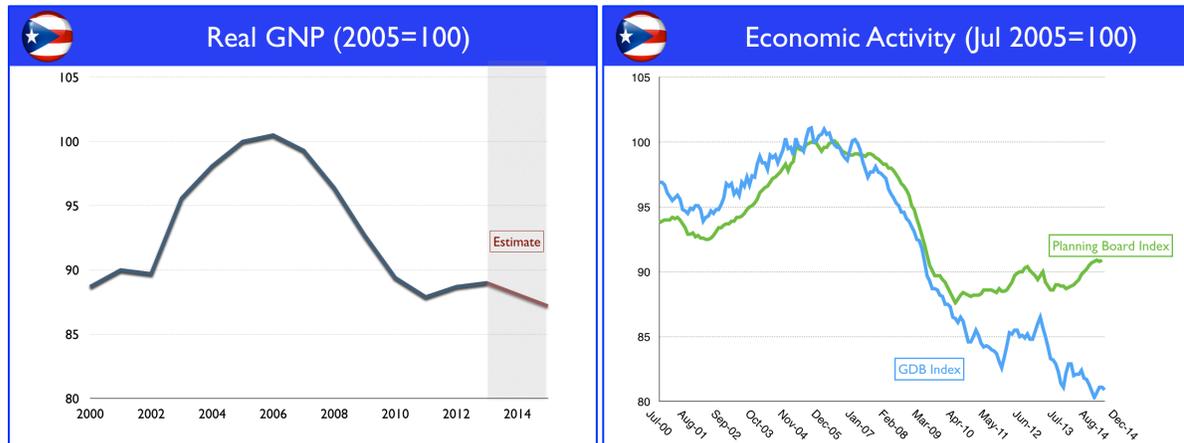
*The shut off from normal market access risks a more pronounced crisis than the slow-motion deterioration the island has endured since 2005. The loss of confidence stems from protracted economic stagnation and weak public finances, which feed each other.*

### 1. Market confidence in the sustainability of public debt has deteriorated markedly.

Starting in 2013, risk premia on general obligation bonds began moving up steadily, as did those on the obligations of public enterprises. The traditional base of municipal bond investors narrowed after ratings agencies downgraded Puerto Rico debt to below investment grade in early 2014, with new investors demanding higher risk premia, shorter maturities, and greater seniority. The mid-teen yields of the government's fiscal agent, the Government Development Bank (GDB), also confirm that the market sees a weak liquidity position and puts a high probability on the risk of default. As a result, the Commonwealth is now virtually shut off from normal market access.



2. **Sections II-III explore the main factors – economic stagnation and persistent fiscal deficits – behind the market's negative assessment of debt sustainability.** Few countries have been able to establish debt sustainability with low growth, which limits revenues and raises debt ratios. In Puerto Rico, growth has not just been low but output has actually been *contracting* for almost a decade now, which is remarkable for an economy suffering neither civil strife nor overt financial crisis. GNP data for the fiscal year ending June 2014 suggest that the economy shrank by about 1% in FY2014. More recent data are not available but our reading of the indicators is that the economy continues to contract at a rate of *at least* 1% per annum, likely more, in FY2015. As discussed in Section II, the drivers of economic decline have been years in the making: the problems are structural, not cyclical, and as such are not going away. Further, as discussed in Section III, fiscal deficits are much larger than assumed. The actions to date are insufficient, and fiscal deficits too are not going away. The economy is in a vicious circle where unsustainable public finances are feeding into uncertainty and low growth, which in turn is raising the fiscal deficit and the debt ratio.



3. **Section IV-VI explain the urgency in the current situation and the case for an alternative approach.** The cash flow position of the government is fast deteriorating. In Section IV, we estimate the fiscal financing gap that must be filled just on current trends (let alone on a deterioration of prospects). This is followed in Section V by a discussion of possible measures to rein in deficits in a manner that is least harmful to growth prospects – certainly less harmful than the alternative of an overt crisis – and the need for debt service relief until such time as the reform program can restore growth and the sustainability of public finances. Section VI subjects the analysis to some skeptical questions.

## II. ECONOMIC ORIGINS

*Both economic shocks and flawed policies have played a role in Puerto Rico's decline. After a decade of stagnation, negative growth is now mostly a supply side problem.*

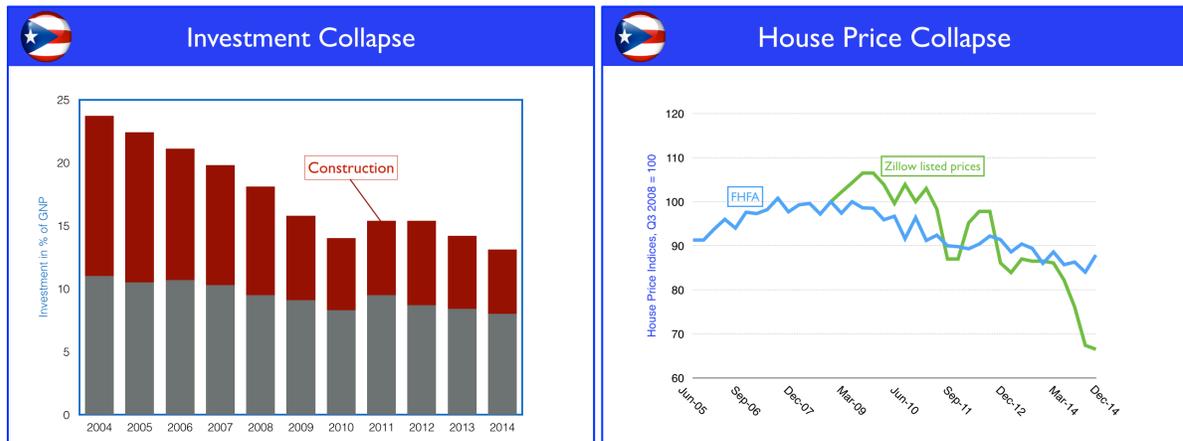
4. **The economic shocks have been numerous.** Because negative growth coincided with the final phase-out of IRS Section 936 provisions for mainland manufacturers on the island, it is customary to cite the loss of tax preferences as the original sin behind Puerto Rico's travails. The loss undoubtedly hollowed out the manufacturing base but was hardly the only blow. Many other forces, perhaps collectively more important, also bore down:

- *Investment/housing bust.* Investment fell by 10% points of GNP in the decade to FY2014, with construction accounting for three-quarters of the overall reduction in the investment ratio. Much of the damage came from the sharp fall in house prices<sup>1</sup>, which preceded the one on the mainland and may be larger than commonly cited indices suggest. Lower home prices reduced the net wealth of individuals and small

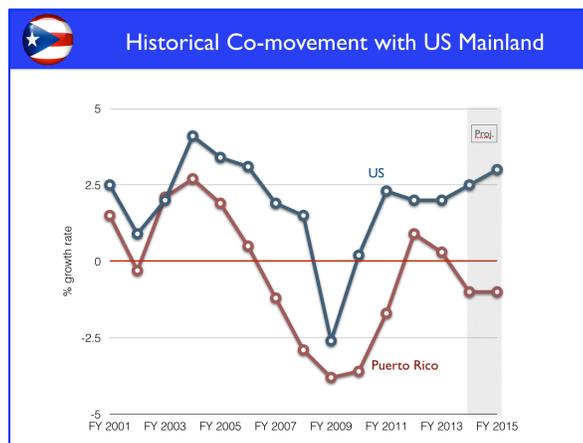
<sup>1</sup> The Federal Housing Finance Administration (FHFA) produces a "repeat sale" index that, by definition, excludes new home sales. But unsold *new* homes have been a big part of the housing boom-bust in Puerto Rico. The figure below on the right therefore also shows a broader index: Zillow's median list prices for new and existing homes. The 38% decline in the latter is large and indicative of on-going market pressures.

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firms, and thus their capacity to borrow. The resulting weakness in consumption and investment, in turn, fed back into housing weakness – another vicious cycle.

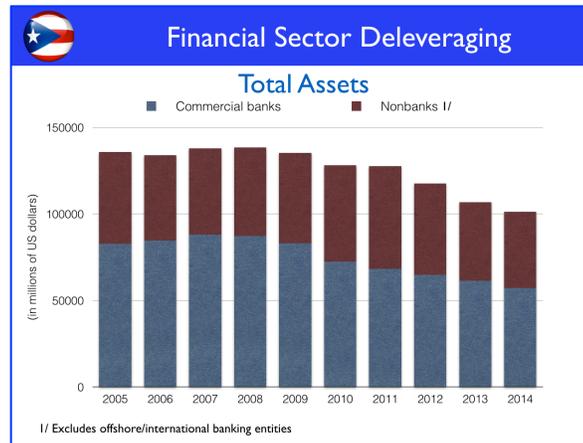


- Recession on the US mainland.* Until recently, economic activity in Puerto Rico tracked that on the US mainland, the island's largest trade partner and investor. As such, the downturn in US activity during 2007-09 had a significant negative effect. The subsequent recovery in US demand should have lifted key sectors such as manufacturing, which is overwhelmingly geared to the US. The fact that this has not happened suggests a structural problem with competitiveness.

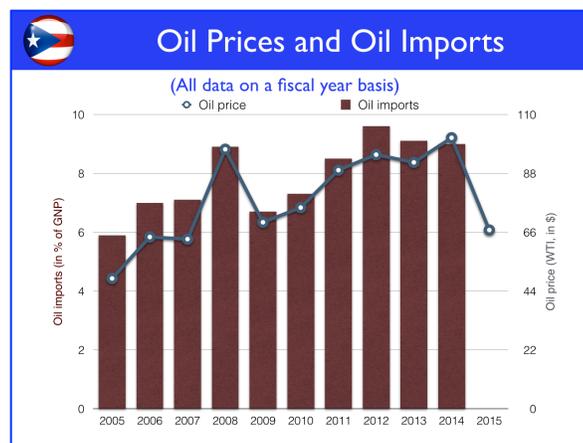


- Bank distress and credit crunch.* The fall in the economy and housing was amplified by the associated distress in the banking sector and vice versa. Commercial bank assets have fallen by 30% since 2005, as banks reduced their balance sheets in response to the hit to their capital from lower asset prices. The distress in the banking sector would have been worse were it not for the backstop provided by FDIC, which had to intervene several banks, and for initiatives such as TARP.

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- *Oil prices.* The doubling in oil prices during 2005-12 was a major setback, given Puerto Rico's dependence on imported oil for virtually all of its power generation. The 3% of GNP increase in the oil bill represented an equivalent loss of income for Puerto Rico that could have supported the local economy.



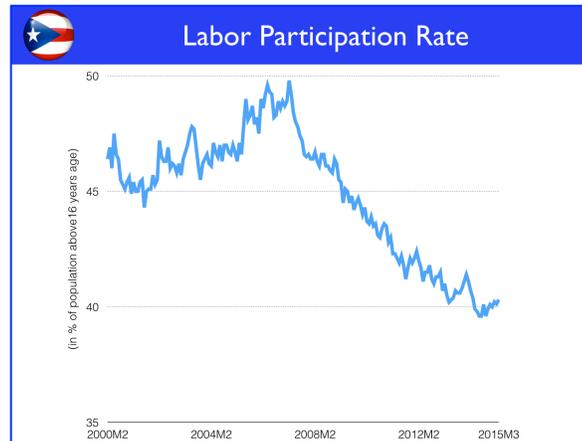
##### 5. **But even more significant forces on the supply side have been gnawing at growth:**

- *Employment and labor costs.* The single most telling statistic in Puerto Rico is that only 40% of the adult population – versus 63% on the US mainland – is employed or looking for work; the rest are economically idle or working in the grey economy. In an economy with an abundance of unskilled labor, the reasons boil down to two.
  - Employers are disinclined to hire workers because (a) the US federal minimum wage is very high relative to the local average (full-time employment at the minimum wage is equivalent to 77% of per capita income, versus 28% on the mainland) and a more binding constraint on employment (28% of hourly workers in Puerto Rico earn \$8.50 or less versus only 3% on the mainland); and (b) local regulations pertaining to overtime, paid vacation, and dismissal are costly and more onerous than on the US mainland.

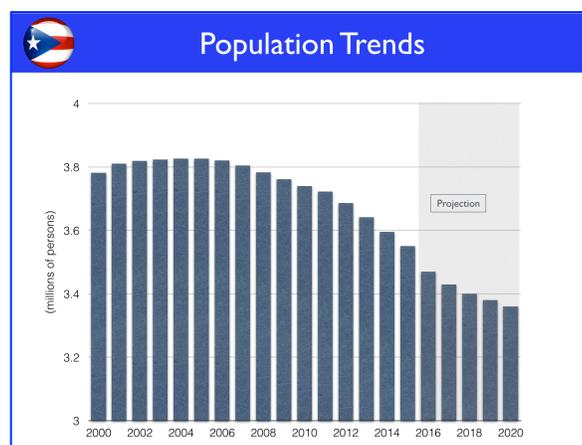
## PUERTO RICO – A WAY FORWARD

- Workers are disinclined to take up jobs because the welfare system provides generous benefits that often exceed what minimum wage employment yields; one estimate shows that a household of three eligible for food stamps, AFDC, Medicaid and utilities subsidies could receive \$1,743 per month – as compared to a minimum wage earner’s take-home earnings of \$1,159.

The result of all of the above is massive underutilization of labor, foregone output, and waning competitiveness.

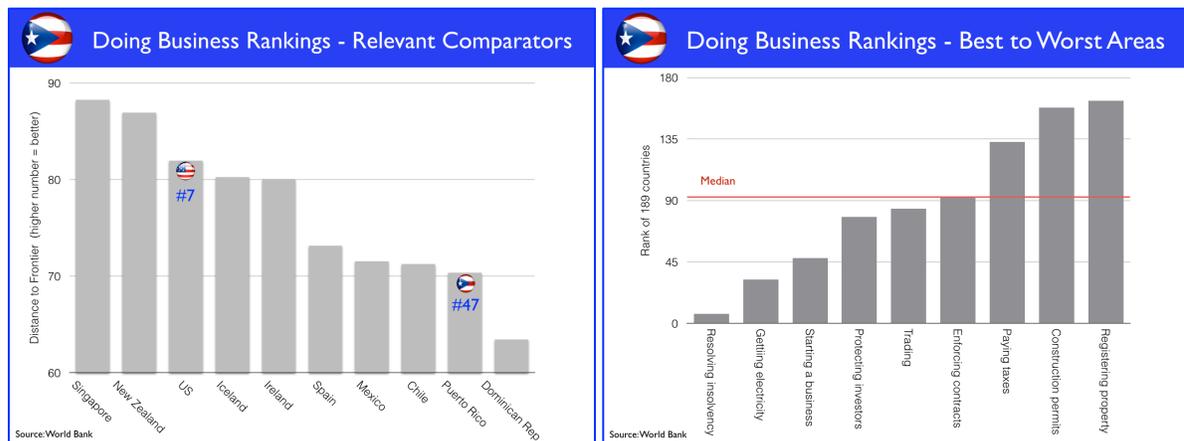


- **Outmigration and population loss.** Diminished job opportunities have also prompted a sharp rise in outmigration, greater even than that in the 1950s. As a result, after growing continuously for almost two centuries, Puerto Rico’s population declined for the first time in 2006, and has since shrunk from its peak to about 3.5 million in 2015. Even if there is no intensification in economic problems, which is a big if, the Planning Board projects that the population will continue to fall through 2020. The loss of 1% of population each year – ten times more than the rate in Japan or West Virginia, the only US state with subzero growth – obviously decreases demand on the island but also potential growth as the labor force shrinks.



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- **Energy costs.** Although they have fallen with oil prices, electricity costs of 22 cents per kilowatt hour are exceedingly high – similar to levels in less developed islands and several times the prices on the US mainland. As a key input cost, this cascades down to locally produced goods and services and stunts potential growth sectors such as tourism. Electricity is produced and distributed by an inefficient and over-staffed public enterprise (PREPA) using technologies decades out of date. A failure to tackle these issues satisfactorily has greatly undermined competitiveness.
- **Transport costs.** All islands, remote from the centers of economic activity, suffer from high transportation costs. But Puerto Rico does so disproportionately, with import costs at least twice as high as in neighboring islands on account of the Jones Act, which forces all shipping to and from US ports to be conducted with US vessels and crews. Even those that consider the negative effects of the Jones Act to be exaggerated – e.g., outbound cargo rates are lower than inbound ones, as ships would rather not return empty – concede it is a clear net negative. Puerto Rico also has local laws that add to transportation costs – specifically, prices and licensing requirements set by the Public Service Commission for ground transportation.
- **Barriers to competition and business activity.** A number of local laws and regulations restrict domestic competition and business investment. Puerto Rico’s rankings in the World Bank’s Doing Business Index slipped to 47 of 189 in 2015 (versus a #7 ranking for the US as a whole); in some areas, the rankings are decidedly bottom tier.



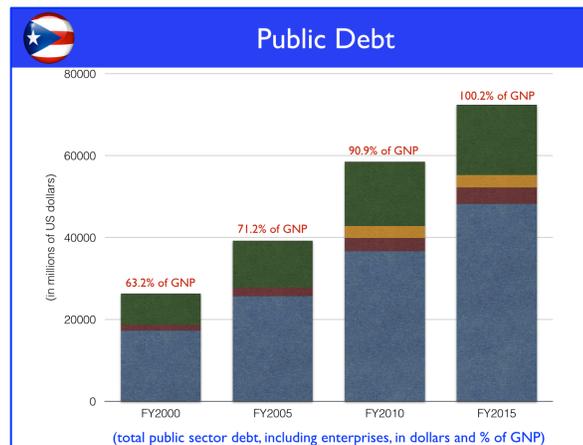
6. **These problems have shaped Puerto Rico’s economic structure, policies, and growth.** High minimum wages and welfare benefits have mostly hit unskilled employment in labor intensive sectors such as tourism; the number of tourist arrivals today is in fact lower than a decade ago, and the number of hotel beds about the same as in the 1970s. The high costs of labor and transportation have meant that Puerto Rico’s manufacturing sector is forced into high-value/low-weight/capital-intensive industries such as pharmaceuticals, bio-technology and software. The high cost of energy and water supply problems have also dissuaded numerous firms and industries from locating in Puerto Rico. To offset this high

input-cost structure, the government has had to resort to tax breaks to attract mainland and foreign direct investment – to the detriment of the tax system and the budget.

### III. FISCAL ORIGINS

*It is not just low growth that is casting a shadow over debt sustainability. Using standard IMF metrics, the overall deficit is larger than recognized, its true size obscured by incomplete accounting. This means that any fiscal adjustment program to restore market confidence starts in a deeper-than-assumed hole.*

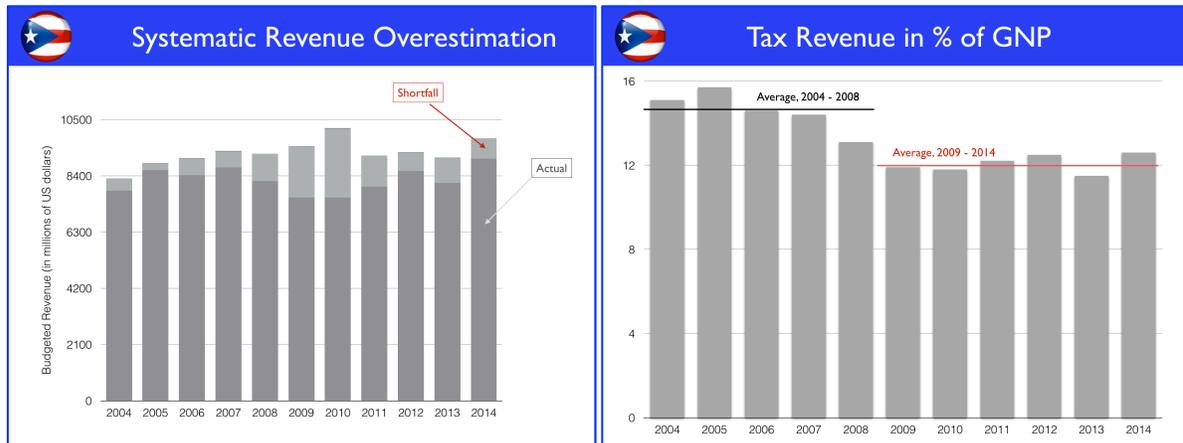
7. **Public sector debt has risen every year since 2000, through good years and bad ones, reaching 100 percent of GNP by end-FY 2014.** The central government and the three large public enterprises – the water and sewerage utility (PRASA), the state electricity company (PREPA), and the highway authority (HTA) – have been responsible for most of the increase in public debt. The fact that debt was rising even in years before the economy started to contract says something about the weakness in public finances. And how could debt continue climbing in the face of one emergency measure after another to “balance the budget” – from the sales tax in FY2006 to staff cuts in FY2009 to pension reform in FY2013?



8. **Persistent deficits reflect institutional factors, not just the weak economy:**

- *Overly optimistic revenue projections and budget formulation.* The Commonwealth’s budget is based on extremely optimistic revenue projections. Over the period FY2004-2014, and even excluding the Lehman shock year FY2009, revenue forecasts have systematically exceeded actual collections by some \$1.5 billion each year (15% of the original budget). The budget also systematically underestimates tax refunds due to the public from previous year filings. Revenue over-estimation happens in other places too – but rarely is it so consistently large. Moreover, tax revenues have slid markedly relative to nominal GNP, from over 15% of GNP prior to 2006 to around 12% of GNP, despite new measures implemented in the intervening period.

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- Lack of expenditure control and the buildup of payables.* Midway in the fiscal year, the Office of Budget Management lowers its revenue forecast and assigns lower spending targets to agencies. But it has no enforcement power to oversee cuts. As a result, spending agencies continue to spend, accumulating unpaid bills that remain in their offices or sit temporarily unpaid at the Treasury. These payables used to be cleared at the start of the next fiscal year with fresh appropriations and debt issuances. But the stock of payables has been rising in recent years, lengthening the queue of unhappy suppliers and the time they must wait to be paid. There are also other problems with expenditure control, including tax verification of payrolls.
- Cash crunch and tax bargaining.* The near continuous pressure on the Treasury often brings government cash deposits down to precarious levels. To deal with this problem, in addition to delaying payables, the Treasury also tries to manage tax receipts. Sometimes, it offers tax amnesties; at other times, it offers a negotiated discount on the anticipated tax obligation if taxpayers pre-pay (closing agreements). While such practices raise needed cash, they also reduce incentives for prompt tax compliance and over time erode the tax base.
- Tax expenditure.* Although statutory tax rates are comparable to federal ones, Puerto Rico grants extensive tax credits and exemptions to attract investment – to alleviate the problem of the island’s high cost structure. For example, it is normal for firms to pay only 0-4% on their profits for 15 years (renewable); in addition, there are numerous tax credits and exemptions from income and excise taxes during and after the construction phase. Not surprisingly, collections have lagged behind the growth in manufacturing income. We have not quantified the foregone revenue/tax expenditure but there are estimates of \$250-500 million per year.
- Deficit monitoring.* The accounting systems in Puerto Rico do not permit timely and reliable monitoring of fiscal trends. The dense and hard-to-penetrate Consolidated Annual Fiscal Report (CAFR) is reliable but not timely – the latest accounts still relate to FY2013. By contrast, information on the Treasury’s General Fund operations is timely but partial, as explained below.

9. **The standard measure of the fiscal balance in Puerto Rico, using General Fund accounts, greatly understates the true deficit and the challenge ahead.** There are three fundamental problems. First, the General Fund is on a cash basis: if, say, the education department delays payments for school supplies, the purchase is not recorded as spending, thus understating the deficit. (Only a year later, after boxes of missing invoices have been hauled to the Treasury and recorded for the CAFR audit, does a truer picture emerge of the fiscal deficit on an accruals basis.) Second, the General Fund excludes numerous agencies – some 150 in total, including large ones like the health insurer ASES and smaller ones like the public buildings administration – that also run deficits, as well as the GDB, which operates like an arm of the government. Third, the General Fund excludes some \$300-400 million per year of capital expenditure; these too deplete cash balances or raise debt and must be counted. These missing items – missing due to the conceptual framework of the General Fund rather than any intention to mislead – are not accounting niceties but directly impact government operations. For example, if the interest payments the GDB has to make depletes its cash balances, this impacts the Commonwealth’s credit rating and market access – even if the General Fund cash deficit were zero. Similarly, if the numerous small agencies run large deficits, these reduce the cash balances available to the Commonwealth. An analysis of fiscal and debt sustainability cannot be conducted on so narrow a measure as the balance in the General Fund.

10. **Accordingly, we construct a measure of the deficit incorporating estimates of non-cash spending and a broader definition of central government.** First, to ensure that both cash and non-cash spending are captured in our metric, we begin by using the fact that the flow deficit must add up to (1) net debt issued to the private sector by the Commonwealth and the GDB; (2) the accumulation of payables (due to suppliers and tax refunds)<sup>2</sup>; (3) the run down of cash balances, and (4) other non-debt creating financing such as asset sales. This measure of the deficit, as used by the IMF, includes all of these financing items.<sup>3</sup> Second, we use a wider definition of the central government, which here is comprised of the Treasury and other primary government units (as defined in Puerto Rico), including those receiving formula-based budgetary transfers (e.g., University of Puerto Rico), the GDB and COFINA. To get the central government primary deficit, we add General Fund revenues, COFINA revenues, and the net operating surplus of the GDB (revenue less administrative expenses) and deduct General Fund expenses (excluding debt service), the net operating deficits (excluding debt service) of the primary units, non-enterprise component units (e.g., ASES), and capital expenditures; federal transfers and spending cancel out but are included as an indicator of the size of the central government in the economy. Effectively, the central government includes all parts of the public sector except the municipalities, the retirement funds, and the three large enterprises (PREPA, PRASA, and HTA).

<sup>2</sup> The payables here refer to macro-relevant arrears (e.g., for suppliers, wages, and tax refunds) and differ from the accounting concept (which includes items like accumulated vacation benefits).

<sup>3</sup> In principle, the GAAP analysis of the CAFR too incorporates the financing sources cited here – but it also includes asset and liability valuation effects, which are not really financing sources for the government and obscure the flow deficit relevant to fiscal policy. Our estimates for past years remove the latter effects.

11. **The primary and overall deficits estimated in Table 1 are larger and more problematic than generally understood.** The original budget objective in FY2015 was to run a surplus of revenue over non-debt expenditure (a primary surplus) sufficient to cover interest and amortization – what in the Commonwealth is called “balancing the budget”. In theory, had this occurred, cash balances and payables would have been unchanged and the debt stock would have declined by the amount of amortization. In practice, Table 1 shows that FY2015 will witness an alarming decline in cash balances and a further buildup of payables due to the fact that the \$850 million primary surplus is a far cry from interest and amortization costs of \$2.8 billion. The problem is not just that revenues are falling short while General Fund spending trundles along. It is also that there is other spending – on goods, services, interest and amortization – by entities other than the General Fund that is draining cash balances. This underlines the importance of using metrics that capture the full financing needs of the Commonwealth. Doing so brings the realization that the central government will be starting FY2016 in a deeper hole than understood, with the room for maneuver constrained by the loss of market access, dwindling cash balances, and a longer queue of disgruntled suppliers.

Table 1. Puerto Rico: Central Government Accounts			
(In millions of dollars)			
	2013	2014	Proj. 2015
Total revenue	15,881	16,468	16,438
Tax Revenue	7,889	8,551	8,724
Nontax revenue	775	590	621
GDB net operating revenue	25	25	25
Cofina	607	630	655
Federal transfers	6,586	6,671	6,414
Total Noninterest Expenditure	16,363	16,797	15,586
GF budget, less total debt service	8,946	9,135	8,325
Net operating deficit non-GF governmental funds 1/	357	359	359
Net operating deficit of non-enterprise comp.units 2/	78	139	200
Capital	396	493	288
Federal programs	6,586	6,671	6,414
Financing gap in retirement funds (ERS, TRS, and JRS)	0	0	0
<b>Primary balance</b>	<b>-481</b>	<b>-329</b>	<b>852</b>
Interest expenditures	2,099	1,743	1,735
<b>Overall balance</b>	<b>-2,580</b>	<b>-2,072</b>	<b>-882</b>
Amortization	1,597	2,606	1,117
<b>Gross Financing Needs</b>	<b>4,178</b>	<b>4,678</b>	<b>2,000</b>
<b>Identified financing</b>	<b>4,178</b>	<b>4,678</b>	<b>2,000</b>
Disbursements	2,535	3,255	0
Change in stock of payables	591	-124	491
Change in stock of deposits	436	1,547	1,508
Privatization	615	0	0
<b>Memorandum items (% of GNP, unless indicated):</b>			
Nominal GNP (millions of dollars)	68,768	69,202	69,195
Revenue, ex-federal	13.5	14.2	14.5
Noninterest expenditure, ex-federal	14.2	14.6	13.3
Primary balance	-0.7	-0.5	1.2
Interest expenditure	3.1	2.5	2.5
Overall balance	-3.8	-3.0	-1.3
Stock of deposits and investments (millions of dollars)	4,554	3,007	1,498
Stock of payables (millions of dollars)	3,302	3,178	3,669
1/ Includes primary government agencies such as Public Buildings, the Medical Services Administration, and the Infrastructure Financing Authority (PRIFA).			
2/ Includes non-primary, non-enterprises, such as ASES.			

## 12. A similar narrative of large flow deficits applies to the wider public sector:

- The three big state enterprises and the employee and teacher retirement funds are also running deficits. Operational data and projections of the enterprises were made available and indicate that the enterprises are generally running overall deficits. The shutoff of market financing means that needed capital improvements, including those mandated by federal environmental laws, have been delayed.
- Although reforms have raised contribution rates and shifted the system away from a defined benefit regime, the continuing payout of previously accumulated rights has fully drained the liquid assets of the employee retirement system for government workers (ERS) and brought those of the teachers and judicial workers to low levels. The combination of high payouts for those with accumulated rights and few new contributors implies shortfalls that will ultimately fall on the central government.

	2014	Proj. 2015	(In millions of US\$)	2014	Proj. 2015
<b>PREPA</b>					
Operating revenue	4,660.5	4,124.0			
Noninterest expenditure	4,211.7	3,563.0			
Primary balance	448.8	561.0			
Interest expenditures	458.4	414.6			
Financing needs	298.5	764.0			
<b>Deficit</b>	<b>9.6</b>	<b>-146.4</b>			
Amortization	288.9	910.4			
Financing sources	816.9	764.0			
Payables	479.3	0.0			
Changes in deposits and inve:	-337.4	342.3			
Disbursements	675.0	0.0			
Arrears on debt service	0.0	421.7			
Debt stock (includes arrears)	8,526.7	8,969.5			
Deposits	1,465.9	1,123.6			
<b>ERS</b>					
Contributions	893.1	925.0			
Pensions & admin costs	1,537.0	1,629.0			
Primary balance	-643.9	-704.0			
Interest expenditures	179.4	166.5			
Financing need	823.2	870.5			
<b>Deficit</b>	<b>823.2</b>	<b>870.5</b>			
Amortization	0.0	0.0			
Financing sources	854.2	872.5			
Payables	0.0	0.0			
Net asset movements	853.2	870.5			
Disbursements	1.0	2.0			
Debt stock	2,186.6	2,186.6			
Assets	2,021.7	1,151.2			
<b>PRASA</b>					
Operating revenue	1,045.5	1,105.6			
Noninterest expenditure	985.5	951.6			
Primary balance	60.1	153.9			
Interest expenditures	241.1	284.6			
Financing needs	258.4	234.4			
<b>Deficit</b>	<b>181.0</b>	<b>130.7</b>			
Amortization	77.4	103.7			
Financing sources	432.8	234.4			
Payables	230.5	0.0			
Changes in deposits and inve:	-39.3	-560.6			
Disbursements	241.5	795.0			
Debt stock	4,095.5	4,095.5			
Deposits	462.9	1,023.5			
<b>TRS</b>					
Contributions	...	383.4			
Pensions & admin costs	...	671.8			
Primary balance	...	-188.4			
Interest expenditures	...	0.0			
Financing need	...	188.4			
<b>Deficit</b>	<b>...</b>	<b>188.4</b>			
Amortization	...	0.0			
Financing sources	...	188.4			
Payables	...	0.0			
Net lending	...	0.0			
Net asset movements	...	188.4			
Debt stock	0.0	0.0			
Assets	1,303.8	1,115.4			
<b>HTA</b>					
Operating revenue	826.9	918.9			
Noninterest expenditure	438.7	639.3			
Primary balance	388.2	279.6			
Interest expenditures	435.8	255.1			
Financing needs	380.8	80.7			
<b>Deficit</b>	<b>47.7</b>	<b>-24.5</b>			
Amortization	333.1	105.2			
Financing sources	380.8	80.7			
Payables	298.8	285.0			
Changes in deposits and inve:	-20.6	-204.3			
Disbursements	102.7	0.0			
Debt stock	4,824.7	4,719.5			
Deposits	769.4	973.7			

13. **These flow deficits have worsened prospects for debt sustainability.** Consolidating the full public sector – central government, three enterprises, and two retirement funds – yields an overall deficit averaging 5% of GNP in FY2013 - FY2014. As nominal GNP growth is

barely 1%, flow deficits of this magnitude imply rising debt ratios, and explain the growing – if belated – concern in financial markets about the sustainability of public debt.

## IV. PROSPECTS UNDER CURRENT POLICIES

*Even if the recent sub-crisis situation could somehow persist (rather than worsen), current policies imply an unsustainable fiscal situation.*

14. **The near-term prospects for growth are poor – but we begin by positing something less bleak.** The reason is that we want to avoid drawing a strong negative conclusion about the fiscal outlook by *assumption* – i.e., by assuming a deteriorating growth outlook. The baseline scenario thus assumes that intermittent access to liquidity forestalls an overt financing crisis, and that real GDP growth somehow remains around -1%. The implied assumption of zero per capita income growth does not strike us as too pessimistic – if anything, it is probably *too optimistic*:

- The international experience is that financial market shocks have far more profound effects on economic activity than real shocks. Therefore, it is likely that investment will remain severely depressed on account of the financial turmoil and uncertainty.
- The forced contraction in the fiscal deficit, as well as the restriction of spending to the revenues coming in each month, will depress aggregate demand.
- The key housing/construction sector remains under pressure. The stock of vacant homes is still high and home prices may have further to fall. Given the centrality of home values as collateral, this will add to the downward pressure on credit.
- The longer-term structural problems persist: the labor force is still shrinking and there is little reason to think that competitiveness has improved.
- The one positive development, a significant one, is lower oil prices. However, the fact that activity indicators have continued to sink in spite of lower oil prices leads us to judge it inadequate to overcome all of the above.

The middle-through-baseline with -1% real growth and 2% inflation is merely an analytical construct to assess the *minimum* financing needs that arise over the next five years. A more realistic macro scenario might consist of a much sharper decline in output if a crisis were to materialize; alternatively, an early decline might be followed by recovery if pre-emptive actions are taken. We will return to the latter.

15. **Against this backdrop, central government deficits and amortizations over the coming years imply an unsustainable trajectory of large financing gaps (Table 2).** The projections focus on FY2016-2020 but, to better convey the challenges, have been extended to FY2025. The baseline uses OMB projections for coming years but does not include the

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progress on the sales tax reform (which is taken into account later on). The result is overall deficits of some \$2½ billion per year (3½ % of GNP) over the next five years; this projection includes budgetary support for the Employee Retirement Fund starting in FY2017, for the judiciary starting in FY2019, and for teachers starting in FY2020. Further, there are: (i) amortizations; (ii) gradual pay down of arrears to suppliers and taxpayers (\$450 million per year); and (iii) downside risks from a potential loss of federal funding for the Affordable Care Act and from a decline in Law 154 excises (due to modified source income accounting rules for firms operating in multiple tax jurisdictions). After factoring these in, the total financing gap ranges from \$3½-8¼ billion per year through FY2025. If market access were open, central government debt would more than double by FY2025. But since that is neither sustainable nor feasible, financing gaps will have to be closed through policy action.

Table 2. Puerto Rico: Central Government Outlook											
(In millions of dollars)											
	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total revenue	16,438	15,874	16,119	16,426	16,628	16,813	16,980	17,154	17,340	17,537	17,738
Tax Revenue	8,724	7,960	8,038	8,117	8,196	8,277	8,358	8,440	8,522	8,606	8,690
Nontax revenue	621	627	632	638	644	650	656	662	669	675	681
GDB net operating revenue 1/ Cofina	25	130	200	329	352	353	335	321	317	320	324
Federal transfers	655	681	709	737	766	799	830	864	898	934	972
Total Noninterest Expenditure	6,414	6,477	6,540	6,604	6,669	6,734	6,800	6,867	6,934	7,002	7,071
GF budget, less debt serv., plus unacc. funds	15,586	15,534	15,992	17,097	17,821	18,519	19,046	19,433	19,787	20,122	20,466
Net operating deficit of non-GF governmental funds 2/ Net operating deficit of non-enterprise comp.units 3/ Capital	8,325	8,045	8,164	8,828	9,519	9,996	10,344	10,574	10,803	11,098	11,409
Federal programs	359	362	366	370	373	377	381	384	388	392	396
Financing gap in retirement funds (ERS, TRS, and JRS)	200	350	353	357	360	364	367	371	375	378	382
	288	300	300	300	300	300	300	300	300	300	300
	6,414	6,477	6,540	6,604	6,669	6,734	6,800	6,867	6,934	7,002	7,071
	0	0	268	638	599	748	853	937	987	951	908
<b>Primary balance</b>	<b>852</b>	<b>340</b>	<b>127</b>	<b>-671</b>	<b>-1,193</b>	<b>-1,707</b>	<b>-2,066</b>	<b>-2,279</b>	<b>-2,447</b>	<b>-2,585</b>	<b>-2,728</b>
Interest on pre-2015 debt	1,735	1,964	2,026	1,971	1,905	1,833	1,882	1,843	1,815	1,693	1,696
<b>Overall balance</b>	<b>-882</b>	<b>-1,623</b>	<b>-1,899</b>	<b>-2,642</b>	<b>-3,098</b>	<b>-3,540</b>	<b>-3,948</b>	<b>-4,122</b>	<b>-4,262</b>	<b>-4,278</b>	<b>-4,424</b>
Amortization of pre-2015 debt	1,117	1,620	931	904	1,575	1,243	1,379	1,462	1,540	1,840	1,818
<b>Gross Financing Needs</b>	<b>2,000</b>	<b>3,243</b>	<b>2,830</b>	<b>3,546</b>	<b>4,672</b>	<b>4,783</b>	<b>5,327</b>	<b>5,584</b>	<b>5,802</b>	<b>6,118</b>	<b>6,242</b>
Identified financing	2,000	-452	-450	-450	-450	-450	-450	-450	0	0	0
Disbursements	0	0	0	0	0	0	0	0	0	0	0
Change in stock of payables	491	-450	-450	-450	-450	-450	-450	-450	0	0	0
Change in stock of deposits	1,508	-2	0	0	0	0	0	0	0	0	0
Privatization	0	0	0	0	0	0	0	0	0	0	0
<b>Financing gap on current policies</b>	<b>0</b>	<b>3,695</b>	<b>3,280</b>	<b>3,996</b>	<b>5,122</b>	<b>5,233</b>	<b>5,777</b>	<b>6,034</b>	<b>5,802</b>	<b>6,118</b>	<b>6,242</b>
<b>Added margin for downside risks</b>	<b>0</b>	<b>0</b>	<b>894</b>	<b>1,903</b>	<b>1,912</b>	<b>1,921</b>	<b>1,930</b>	<b>1,939</b>	<b>1,948</b>	<b>1,957</b>	<b>1,967</b>
Loss of ACA funding 4/ Law 154 excise losses			0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
			894	903	912	921	930	939	948	957	967
<b>Total financing gap</b>		<b>3,695</b>	<b>4,174</b>	<b>5,899</b>	<b>7,034</b>	<b>7,153</b>	<b>7,707</b>	<b>7,972</b>	<b>7,750</b>	<b>8,075</b>	<b>8,208</b>
<b>Memorandum items (% of GNP, unless indicated):</b>											
Nominal GNP (millions of dollars)	69,195	69,873	70,558	71,249	71,947	72,652	73,364	74,083	74,809	75,542	76,283
Revenue, ex-federal, on current policies & risks	14.5	13.4	12.3	12.5	12.6	12.6	12.6	12.6	12.6	12.7	12.7
Noninterest expenditure, ex-federal, on current policies & risks	13.3	13.0	13.4	16.1	16.9	17.6	18.1	18.3	18.5	18.7	18.9
Primary balance on current policies & risks	1.2	0.5	-1.1	-3.6	-4.3	-5.0	-5.4	-5.7	-5.9	-6.0	-6.2
Interest expenditure on current policies & risks	2.5	2.8	2.9	2.8	2.6	2.5	2.6	2.5	2.4	2.2	2.2
Overall balance on current policies & risks	-1.3	-2.3	-4.0	-6.4	-7.0	-7.5	-8.0	-8.2	-8.3	-8.3	-8.4
Stock of deposits and investments (millions of dollars)	1,498	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Stock of payables (millions of dollars)	3,669	3,219	2,769	2,319	1,869	1,419	969	519	519	519	519
1/ Includes petroleum tax (PET) net receipts as a revenue source for the GDB in 2016-2025.											
2/ Includes primary government agencies such as Public Buildings, the Medical Services Administration, and the Infrastructure Financing Authority (PRIFA).											
3/ Includes non-primary non-enterprises, such as ASES (healthcare agency) and the bus and ferry mass transit authority (from 2016 on).											
4/ As in many of the projections, the actual outcome could be worse. For example, in the absence of reform of the healthcare system the cost here could reach \$2 billion by 2019 and the gap in the retirement funds could be larger in the absence of strict adherence to increasing contribution rates.											

16. **The financial situation of the public sector enterprises is also precarious.** The projections assume that the central government will have to assume loss-making operations of the highway authority to keep it afloat. The electric utility PREPA is already operating on

a pure cash basis; until its situation with its creditors is regularized, it accumulates interest and amortization arrears of over \$600 million per year. The water and sewage company PRASA is not projected to generate enough revenues to cover EPA-mandated investments.

## V. A STRATEGY FOR GROWTH AND CONFIDENCE

*The restoration of confidence and growth requires ambitious measures in three inter-locking areas: structural reform, fiscal consolidation/debt restructuring, and institutional reform. All are important, and the exclusion of any one reduces the chances of success of the others.*

17. **The key to turning around Puerto Rico’s situation is a revival of growth.** The island has many problems but they all result in the same outcome – a lack of growth. Structural rigidities have compromised competitiveness and yielded stagnation. Weak fiscal discipline has resulted in uncertainty that is further depressing economic activity and employment. Low growth feeds back to strains on revenue and spending. It is a vicious circle.

18. **A comprehensive approach is needed.** The problems are too interdependent. For example, fiscal adjustment alone might strengthen confidence in long-term public finances and thereby support demand. But too much fiscal tightening could also depress demand in the near-term and would do nothing to address the supply side problems at the root of Puerto Rico’s growth problem. Similarly, structural reforms alone would still leave large fiscal financing gaps. Hence the need for complementary structural reforms to boost growth and debt restructuring to avoid an economically harsh and politically unviable cut in the fiscal deficit. A combination of structural reforms, fiscal adjustment, and debt restructuring ensures that all problems are addressed. And, importantly, it shares the costs and benefits of adjustment across all stakeholders.

19. **Puerto Rico’s record of failed partial solutions also argues for a comprehensive approach.** Over the years, successive administrations put in place important and even lasting policy responses. However, they focused on fiscal deficits, not economic growth. Moreover, even the narrow approach was implemented in an ad hoc manner in response to immediate pressures rather than in a forward-looking way that acknowledged the scope of fiscal problems. Thus, the introduction of the sales tax in FY2006 was followed by a fiscal emergency to cut government staffing in FY2009, by reform of public employee and teacher pensions in FY2013, by the petroleum tax in FY2014, and most recently by the attempted VAT reform – each presented as a durable solution to the island’s problems. Puerto Rico’s current predicament reflects its unsustainable policies but also a lack of confidence in its preparedness to change course.

20. **Establishing a new and credible strategy will be challenging.** The needed measures face domestic political resistance (e.g., on labor laws and cutting fiscal deficits), federal inertia (e.g., on exemptions to the minimum wage and the Jones Act), legal challenges (e.g., on debt restructuring), and organizational difficulties in keeping the program on track. New institutions to establish budget discipline and data transparency will need to be created. All

this will fully occupy the administration. But so would *not* implementing a comprehensive solution, which might usher in an even more severe and harder-to-manage crisis.

## A. STRUCTURAL REFORMS

*Supply-side reforms are fundamental to any lasting economic recovery but will take time to implement and to bear fruit.*

21. **Puerto Rico has many advantages to build on but also important disadvantages, some within its power to tackle and some requiring federal help.** Among the advantages are its natural gifts as a tropical island, the size of its college-educated and bilingual population, its sizable manufacturing base, its situation as an integral part of the United States, with all the attendant benefits in terms of currency stability, legal system, property rights, and federal backing of welfare, education, defense, and banking. That is a lot. At the same time, there are numerous policy failures that raise input costs and stifle growth. While some of these are within the Commonwealth's power to fix (such as local labor regulations), others lie in the remit of the federal government and the US Congress (the minimum wage and welfare rules, the Jones Act, and Chapter 9 bankruptcy eligibility). If these could be overcome, there is no reason why Puerto Rico could not grow in new directions – likely ones like tourism, possible ones like serving as a financial/services hub between North and South America, and entirely unpredictable ones because that is how reforms have played out elsewhere. Reducing input costs for labor, energy and transport is key to regaining competitiveness, so that production can be geared to more buoyant external markets.

22. **A fresh start on structural reforms should begin with the recognition that supply-side reforms take time.** Partly this is because reforms are hard to formulate and legislate. Partly it is because, even after being implemented, it takes time for people to perceive the change and to gain confidence that reforms will stick and not be reversed by the next administration. The impact on growth could take 2-4 years to become apparent, less when (a) there is a prior history of successful reforms; (b) the strategy and details are effectively communicated; (c) all segments of society share in the reform effort's near-term costs and long-term gains; and (d) the program as a whole is credible, with upfront delivery of key reforms. Experience also teaches that while the goals should be clear at the start, structural reform is more a process than a check-list: the details need to evolve with circumstances.

23. **To raise employment, it is imperative to remove the disincentives for firms to hire workers and for workers to accept jobs.** As suggested earlier, the key issues are as follows:

- The US federal minimum wage of \$7.25 per hour is too high relative to local incomes and regional competitors. Puerto Rico should seek an exemption until such time as its per capita income approaches that of the poorest US state, which currently is still 50% higher than Puerto Rico's. If full exemption is not possible, then an alternative might be to set the rate for Puerto Rico at one-third the general rate (per capita income in Puerto Rico is about one-third that on the mainland).

- Local labor laws magnify employment costs. Undoing this entails: (i) redefining overtime as on the mainland (excess over a 40-hour week, not 8-hour day); (ii) cutting paid vacation days to mainland levels (for public sector workers, from 30 days to 15 days); (iii) eliminating the mandatory end-of-year bonus; (iv) reducing onerous requirements for proving just cause in layoffs to mainland levels; (v) extending the probationary period for new employees from 3 months to 1-2 years; and (vi) relaxing labor laws for youth/new entrants for the first few years.
- Federal welfare payments are generous relative to the low incomes in Puerto Rico, and as such are a disincentive for the unskilled to accept work (lest they lose benefits). Welfare needs to be made consistent with local labor market conditions rather than with US mainland conditions. The federal government should therefore give the Commonwealth more latitude to adjust welfare requirements and benefits – e.g., to continue food stamps for a while even after a person returns to work; or to provide lower housing benefits to more people rather than higher benefits to a few (the Commonwealth block grant is capped and insufficient for all those who qualify). Puerto Rico too can act here, cutting back the Medicaid benefits it pays out over and above the Federal minimum standard (thus saving some \$150 million per year).

24. **Exempting Puerto Rico from the US Jones Act could significantly reduce transport costs and open up new sectors for future growth.** In no mainland state does the Jones Act have so profound an effect on the cost structure as in Puerto Rico. Furthermore, there are precedents for exempting islands, notably the US Virgin Islands. Puerto Rico should also eliminate its own self-imposed costs by freeing up the scope for competition in ground transportation and liberalizing the associated prices set by the Public Service Commission.

25. **The drive for competitiveness must include a cut in high energy costs, which cascade down to the rest of the economy.** The silver lining in PREPA's financial difficulties is that it has forced the public enterprise to confront its problems of over-staffing and inefficiency. The specifics of upcoming reforms, and the associated debt relief to make it viable, are still being worked out by PREPA and its creditors. Whatever the details, they should build to a solution where PREPA focuses on transmission and distribution, while electricity generation is opened up to competition from newer and more efficient suppliers.

26. **A lot can be done to lighten the burden of doing business, which is particularly important when reforms are aiming to move the economy in new directions.** To date, the term business-friendly in Puerto Rico has referred to efforts to offset high input costs with tax breaks and subsidies. As input costs are brought down, the focus should shift to ensuring a level playing field and greater ease of doing business, including permits for new businesses. This is always an on-going task but a start could be made by addressing the three weakest areas identified by the World Bank: the difficulty in registering property, in paying taxes, and in obtaining construction permits. There is already some progress to build on, notably a plan to modernize property registration. Lest this sort of work slip into

obscurity in the press of a crisis, the task should be assigned to a high-level official held accountable for pulling up the Commonwealth's score in future Doing Business rankings.

## B. FISCAL ADJUSTMENT AND PUBLIC DEBT

*Given looming revenue and spending pressures, eliminating the fiscal deficit will take substantial measures. Reforms should aim more at broadening tax bases than raising rates, and at targeted expenditure reduction rather than across-the-board cuts. But even a major fiscal effort leaves large residual financing gaps that will need to be bridged with debt relief.*

27. **Table 3 illustrates a scenario where revenue and expenditure substantially reduce the total financing gap in coming years.** The measures set out below, along with the revenue enhancing effects of structural reform, would eliminate the overall budget deficit by FY2020. Given the starting point of fiscal unsustainability, this is important. At the same time, the adjustment scenario tries to be as growth friendly as possible, avoiding too sharp a contraction in the near-term, and focuses more on broadening tax bases than on raising tax rates. The measures below are, in our view, sensible and feasible. But there are undoubtedly other sensible and feasible options the government will also want to explore.

Table 3. Puerto Rico: Central Government Outlook											
(In millions of dollars)											
	Proj. 2015	Proj. 2016	Proj. 2017	Proj. 2018	Proj. 2019	Proj. 2020	Proj. 2021	Proj. 2022	Proj. 2023	Proj. 2024	Proj. 2025
<b>Total financing gap</b>		3,695	4,174	5,899	7,034	7,153	7,707	7,972	7,750	8,075	8,208
<b>Additional reform measures</b>		1,157	1,822	3,315	4,174	4,913	5,191	5,482	5,758	6,047	6,352
Revenue measures		1,157	1,576	2,073	2,439	2,827	3,005	3,194	3,394	3,604	3,827
Rise in income taxes from labor reform		0	56	142	248	376	527	689	860	1,043	1,237
Revamp property tax		100	200	350	350	350	357	364	371	379	386
Elimination of tax amnesties and closings		0	50	50	50	50	50	50	50	50	50
Overhaul of corporate tax system		0	250	500	750	1,000	1,010	1,020	1,030	1,040	1,050
VAT/sales tax		1,057	1,021	1,031	1,041	1,051	1,061	1,072	1,082	1,093	1,104
Expenditure measures		0	246	1,242	1,735	2,086	2,186	2,288	2,364	2,443	2,525
Renewal of Law 66		0	0	568	800	1,051	1,072	1,093	1,115	1,138	1,160
Resizing of education services		0	50	200	300	400	450	500	523	547	571
Bring down medicaid benefits to federal standards		0	75	150	150	150	157	164	171	179	187
Reduced subsidization of UPR		0	121	323	485	485	507	530	554	579	606
<b>Increased revenue from reform-induced increase in GNP growth</b>		0	509	632	791	988	1,227	1,479	1,745	2,025	2,319
<b>Residual financing gap after measures</b>	<b>0</b>	<b>2,538</b>	<b>1,843</b>	<b>1,952</b>	<b>2,069</b>	<b>1,253</b>	<b>1,288</b>	<b>1,011</b>	<b>247</b>	<b>3</b>	<b>-463</b>
<b>Total debt service</b>	<b>2,852</b>	<b>3,583</b>	<b>2,957</b>	<b>2,875</b>	<b>3,480</b>	<b>3,076</b>	<b>3,261</b>	<b>3,305</b>	<b>3,355</b>	<b>3,533</b>	<b>3,513</b>
Principal amortization	1,117	1,620	931	904	1,575	1,243	1,379	1,462	1,540	1,840	1,818
Interest	1,735	1,964	2,026	1,971	1,905	1,833	1,882	1,843	1,815	1,693	1,696
<b>Memorandum items (% of GNP, unless indicated):</b>											
Nominal GNP in reform scenario (millions of dollars)	69,195	69,873	71,270	73,423	76,014	79,085	82,684	86,446	90,379	94,491	98,791
Real GNP growth (in %)	-1.0	-1.0	0.0	1.0	1.5	2.0	2.5	2.5	2.5	2.5	2.5
Inflation (in %)	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Revenue, ex-federal, in reform scenario	14.5	15.1	15.2	16.2	16.8	17.4	17.7	18.0	18.3	18.6	18.9
Noninterest expenditure in reform scenario	13.3	13.0	13.1	14.4	14.6	15.0	15.4	15.7	15.9	16.1	16.3
Primary balance in reform scenario	1.2	2.1	2.2	1.8	2.2	2.5	2.3	2.4	2.4	2.5	2.6
Overall balance in reform scenario	-1.3	-0.7	-0.7	-0.9	-0.3	0.2	0.0	0.2	0.4	0.7	0.9
Stock of deposits and investments (millions of dollars)	1,498	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Stock of payables (millions of dollars)	3,669	3,219	2,769	2,319	1,869	1,419	969	519	519	519	519

28. **On the revenue side, there is scope to raise receipts by \$1 billion in FY2016, around \$3 billion annually by FY2020 and \$4 billion annually by FY2025.** Some possible measures:

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- Adoption of a sales tax as proposed by the administration; this could yield just over \$1 billion in FY2016.
- A surcharge on the corporate income tax that would also cover firms currently paying only 0-4% (versus the statutory 35%). This should be seen as a first step to an eventual overhaul that replaces widespread exemptions with a low flat rate of 10-15%; this is assumed to yield \$250 million starting in FY2017 and to rise quickly after that.
- A step up in property taxes (currently based on real estate values from 1954); updating the registry and adjusting down tax rates could yield \$100 million in FY2016 and more in later years as the project takes off (a target of 1% of GNP is reasonable). This is shown in Table 3 as a revenue measure but could equally be treated as a spending measure: since municipalities normally retain property taxes, the central government revenue could cut its transfers to municipalities by the amount of additional property tax receipts.
- Rising income tax collections from higher worker participation due to labor reforms; the amount raised is assumed to be a modest \$50 million in early years but grows quickly.

The payoffs from the above are indicative and obviously will depend on details that have yet to be worked out. Substantial additional revenue might also accrue from improved tax collection, which is low relative to statutory rates not just due to exemptions but also due to poor compliance; no assumptions regarding improved compliance are made at this stage.

**29. On the expenditure side, there is scope to save over \$2 billion per year by FY2020 and \$2½ billion per year by FY2025:**

- Renewing Law 66 (freeze of certain formula-based transfers from the general fund) and freezing remaining spending in real terms saves \$1 billion by FY2020. Capital/infrastructure is assumed flat but could be raised if revenues exceed expectations.
- Puerto Rico currently has 40% fewer students but 10% more teachers than a decade ago. Teacher-student ratios are high, higher than in the mainland and many of its wealthiest and best-performing counties. A gradual cut in the number of teachers saves \$400 million per year by FY2020 – more if sparsely attended schools are also consolidated. The one-off costs of retrenchment should be met by one-off revenues, e.g., if valuable/cash-rich enterprises like the state insurance fund are privatized.
- A reduction in the subsidy for the University of Puerto Rico. College students currently pay a low flat rate that for many is far lower than on the mainland and far lower than what well-off UPR students paid for private high school. Rather than a blanket subsidy, support should be provided through need-based scholarship. A program along these lines could save up to \$500 million by FY2020.
- Cuts in Medicaid benefits in excess of minimum standards on the US mainland. This could save an estimated \$150 million per year.

Despite these cuts, total expenditure would still rise in dollar terms and relative to GNP as it is assumed that the government makes up for any cash shortfalls of the retirement funds.

30. **The fiscal benefits of comprehensive reform should also be factored in.** The bottom of Table 3 sets out a higher growth path than assumed so far. The difference between a trend real GNP growth of -1% and of +2.5% delivers additional revenue of some 2½% of GNP by FY2025, which is built into the projections of the residual financing gap after measures.

31. **The quantitative estimates in Table 3 are subject to great uncertainty and do not reflect the full menu of policy options.** Apart from known unknowns such as the size of declines in Law 154 excise receipts, the baseline financing gap projections are subject to numerous other assumptions (e.g., the rate at which payables are brought down) and do not cover all government reform needs (e.g., retirement system funding). The impact of measures also hard to predict and depend on the timing and specifics. Could the measures be enhanced or made more front loaded? Perhaps but not easily. Even if enacted quickly, it would be imprudent to assume large revenue increases in the first year of an adjustment program, when economic pressures and implementation difficulties are at their most intense. The payoff is especially unclear with regard to the corporate tax surcharge – although the need to claw back decades of exemptions and tax spending is acute.

32. **Even after factoring in a major fiscal effort, a large residual financing gap persists into the next decade – implying a need for debt relief.** On the assumptions embodied in Table 3, to close the residual financing gap, the government would need to seek relief from a significant – but progressively declining – proportion of the principal and interest falling due during FY2016-23 the residual financing gap disappears by FY2024. The precise amount of debt relief will need to be calibrated to the specifics of the reform and the likely path of the economy, both of which are uncertain at this stage.

33. **Debt relief could be obtained through a voluntary exchange of old bonds for new ones with a later/lower debt service profile.** To agree to it, bondholders would need to be convinced that the specific reforms on the table are indeed a best use of debt relief, and that – by keeping the government functioning as it phases in organizationally and politically difficult measures – the reform program will increase the expected value of their claims. Negotiations with creditors will doubtlessly be challenging: there is no US precedent for anything of this scale and scope, and there is the added complication of extensive pledging of specific revenue streams to specific debts. But difficult or not, the projections are clear that the issue can no longer be avoided.

34. **Any discussion with creditors on general obligation debt should be coordinated with the parallel one being conducted by public enterprises.** The government will need to coordinate its own discussions on general obligation debt with those already in progress for public enterprises – not least because creditors too, like the government, will look at the overall resource envelope and investment needs in public enterprises. To facilitate a more orderly discussion of debt, it would help if the US Congress were to remove the explicit exclusion of Puerto Rico from the provisions of Chapter 9 of the US bankruptcy code.

## C. INSTITUTIONS AND CREDIBILITY

*The legacy of budgetary laxity, non-transparency, and unreliable/dated statistics must be overcome if the reform program is to work and command credibility. The priorities include a rolling 5-year budgetary plan approved by the legislature, legislative rules to limit changes to the plan, an independent fiscal oversight board to advise on the budget and control its implementation, and strengthening the quality and timeliness of economic data.*

35. **The first step must be legislative approval of a long-term fiscal plan.** Broad political backing for the fiscal adjustment plan – for all five years of the adjustment, not just for FY2016 – will be crucial to its credibility. To limit the scope for deviations, the legislature should consider adopting rules that either force across-the-board spending cuts (a Gramm-Rudman rule) or else some combination of spending cuts and tax increases (a PAYGO rule) if any subsequent measure or event causes the projected fiscal deficit to deviate from its planned path. Experience shows that such legislative rules can improve fiscal discipline, but cannot ensure it, as they work by restraining fiscal plans rather than fiscal outcomes.

36. **An independent fiscal oversight board can improve fiscal outcomes.** The group, comprised of experienced individuals from inside and outside the Commonwealth, would vet the current year's budget and the rolling 5-year fiscal plan prior to submission to the legislature; it would also have special powers to enforce approved budgets. These powers are needed because of Puerto Rico's legacy of overly-optimistic budget estimates and of failure to control spending even when it is clear that revenue targets will not be met. Effective expenditure control will take more than an oversight board at the top. It will also take uniform data and reporting requirements across all spending agencies – spending units currently employ different IT systems – as well as internal coordination. The existing single treasury account needs to be employed as an expenditure control mechanism as well as its current use as a centralized payment system. Notwithstanding the logistical challenges, consideration should be given to merging the operations of the Government Development Bank and the Commonwealth Treasury (Hacienda). The functional overlap is significant, while coordination is hindered by differences in formal roles and governance structures.

37. **Greater transparency in the provision of fiscal data could also enhance market discipline.** As discussed earlier, the published quarterly figures are too narrow in scope to provide an accurate picture, while the CAFR consolidated accounts appear with a long lag and are difficult to interpret. Analysts should not have to engage in jujitsu with the data in order to figure out the fiscal deficit. The data will need to be put in a standardized format, as has been done in this report, and published in regular updates.

38. **Finally, statistics on the wider economy need to be strengthened – urgently.** The problems with the national accounts are severe. The US Bureau of Economic Analysis has a report on what needs to be fixed but a lack of resources has limited progress. Consideration should be given to consolidating the relevant statistics providers and giving them necessary funding. Better statistics are not a luxury. Without them the Commonwealth is flying blind

and market uncertainty about underlying developments is reflected in the risk premium on government debt. Improved statistics and data transparency could pay for themselves.

## VI. OBJECTIONS AND RESPONSES

*This section subjects some of the above arguments to a stress test of counterarguments – not to pre-empt objections but to probe into the thinking behind the analysis.*

39. **Objections – growth.** Some might wonder if the report is too pessimistic on near-term prospects. After all, there are positive signs. Private employment has stopped falling; the GDB’s economic activity index has improved; and many individual sectors are doing well, including tourism, agriculture, and increasingly aeronautics. It could also be argued that official figures underestimate growth on account of overestimated price deflators.

40. **Response.** Fine but the improvements are too small, narrowly focused, recent – and dwarfed by the gorilla in the room: the damage from a decade of stagnation and the cutoff of market access, which experience tells us has severe negative effects on credit, investment, and consumption. More generally, Puerto Rico is suffering from protracted supply side problems, its growth potential eroding in the face of a shrinking labor force, narrowing manufacturing base and depreciating capital stock. Turning this around will take time and more ambitious action. Finally, on GNP statistics, the overestimation of price deflators is not the only problem: *nominal* GNP may also be overstated, in which case lower price deflators do not necessarily yield higher real growth estimates.

41. **Objections – Puerto Rico structural reforms.** Many will doubt that upfront action in so many structural areas is feasible in Puerto Rico. The reforms are difficult enough individually. Attempting all at once risks overloading the political circuits.

42. **Response.** The government is better positioned than we are to assess political feasibility. Certainly, many countries have found ways to muster support for comprehensive reforms, albeit usually in the context of international support. But, support or no support, the island has little choice now but to press ahead. It has tried gradual and partial solutions to no avail. The crisis can concentrate minds in the political system to suspend “business as usual” and attend to all that has gone untended for years – it ought to get on with this regardless of the speed of federal action. Not all action need be up front but there should be enough up front to make it credible, with a clear road map of further reforms and where they lead. Importantly, the proposed package shares the costs of reform – lower wages for labor, fewer tax exemptions for business, debt re-profiling for creditors – while holding out the prospect of renewed confidence and growth, which benefits all.

43. **Objections – federal structural reforms.** Why not focus on something simpler like reviving US tax preferences? Many consider it naïve to think that the US Congress would modify labor and transportation laws intended for all of the United States just to help out

Puerto Rico. It may be easier to push for something that the Congress has agreed to before – tax preferences, the loss of which is anyway the original sin behind the island’s travails.

44. *Response.* Reforms in labor, transport, and bankruptcy laws are economically essential. They may face political resistance in Washington DC but Puerto Rico has a case to make. On reinstating US tax preferences, it is not clear that this is an easier ask for the US Congress. Or that mainland firms would necessarily be lured to the island, as exemptions can – and have – been withdrawn before. Or indeed that a growth model founded on tax advantages is better in the long run than one based on genuine competitiveness.

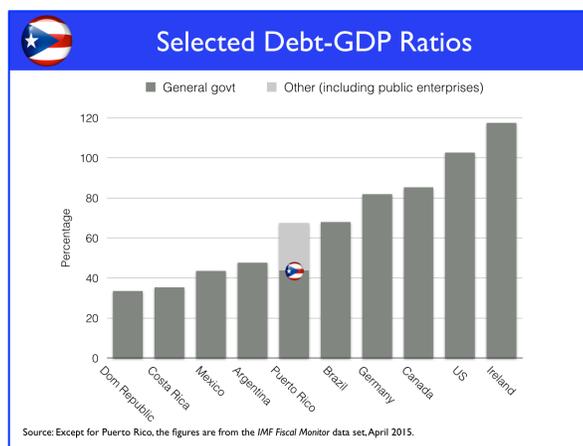
45. *Objections – minimum wage.* Even if one accepts that there may eventually be positive effects on hiring from lower wages, one has also to take into account that lower wage earnings by the currently employed will reduce domestic spending and growth.

46. *Response.* First, it is unlikely that a reduction in the minimum wage will induce an instantaneous fall in all wages in Puerto Rico. The downward pressure on wages, like the upward pressure on employment, will take time to play out; and anyway, below minimum-wage market wages already exist in the large informal sector. Second, even if currently employed workers reduce their spending by some fraction of lost earnings, this should be offset – more than offset – by the higher spending of the newly employed. Third, labor reform should be seen in a wider context of the effort to restore confidence in future growth, which should raise consumption and investment.

47. *Objections – pace of fiscal adjustment.* Some observers might point to the contrasting experiences of Ireland and Greece with fiscal adjustment. Ireland, in many ways similar Puerto Rico (a large resident base of multinational firms, a recent housing bust, low corporate taxes), had much better growth outcomes partly because it had a more gradual fiscal adjustment than Greece. Puerto Rico should heed the lesson that fiscal multiplier effects are high in crisis situations, and so reduce its fiscal deficit only gradually.

48. *Response.* There was scope for slower fiscal adjustment in Ireland because off-market financing was made available to it by Euro zone partners and the IMF. Ireland’s policy credibility was also enhanced by quarterly EC/IMF monitoring of program implementation, and by the fact that its fiscal problem was not decades old but the result of a banking crisis. These points do not apply to Puerto Rico, thus limiting its options. That said, Puerto Rico does have scope to generate some financing by reprofiling part of the debt service falling due, and having the adjustment effort overseen by a fiscal oversight board. Ultimately, Puerto Rico needs to strike a balance between the demands of financing, credibility and growth – which is what the fiscal adjustment scenario here tries to do.

49. *Objection – debt burden.* Many people argue that Puerto Rico’s debt ratios aren’t bad by international standards, especially if the Commonwealth’s ratio is calculated relative to *GDP* (not *GNP*, which is much lower) and public enterprises are excluded (as in other countries). They argue that Puerto Rico’s problem is not too high debt but too high deficits.



50. **Response.** Regardless of whether public enterprise debt is included or not, or deflated by GDP rather than GNP, the fact is that Puerto Rico's situation is worse than simple debt ratios suggest because the island is laboring under near-zero *nominal* GNP/GDP growth. This inevitably forces up debt ratios over time. None of the other countries in the chart is in this situation. On inclusion of enterprises in public debt statistics, that hinges on whether the government can, as a practical matter, maintain a hands off financial relationship with enterprises. Could Puerto Rico countenance an interruption – prolonged by the absence of Chapter 9 bankruptcy provisions – in the electricity, water and transportation services provided by public enterprises? Probably not.

51. **Objection – restructuring general obligation debt.** To some, it seems quixotic to try to restructure Puerto Rico central government debt given that (1) the Commonwealth's constitution prioritizes these obligations; (2) the task is complicated by the extensiveness of pledged revenues; and (3) no US state has restructured its general obligation debt in living memory. Any attempt faces unprecedented legal challenges. Moreover, in the absence of an IMF or debtor-in-possession creditor for Puerto Rico during a potentially drawn out legal process, the government's capacity to provide essential services would be compromised. Rather than a formal restructuring process, it would be preferable to raise taxes and cut spending by a lot more, thus inducing creditors to voluntarily roll over maturing debt.

52. **Response.** A decision to restructure debt, even via a market-friendly debt exchange, is never taken lightly. The legal challenges are indeed a complex issue for the government's legal advisors. But from an economic perspective, the fact remains that the central government faces huge financing gaps even *with* substantial adjustment efforts. There are limits to how much more expenditures can be cut or taxes raised. A tax to GNP ratio of 12-13% may seem low by US standards (it is similar to states, but the latter also pay federal taxes from which Puerto Rico is exempt). However, statutory *tax rates* are high in Puerto Rico, similar to federal rates, and – before contemplating further hikes – one has to be mindful of the already large informal economy, and the hit to near-term growth from a sharper fiscal contraction; if output falls significantly, tax receipts will decline. Too much fiscal adjustment also raises questions about fair burden sharing between creditors and taxpayers, and puts at risk the political viability of the overall reform effort. These thoughts

will also occur to creditors when they assess the credibility of a sharper fiscal response – a mere show of fiscal austerity will not necessarily induce them to roll over maturing debt. Yes formal debt restructuring without an IMF or debtor-in-possession lender in the background carries risks. But so does unrealistically high fiscal adjustment and the rollover of debt at unaffordable interest rates and seniority.

## VII. CONCLUDING THOUGHTS

*The situation is acute in the face of faltering economic activity, faltering fiscal and debt sustainability, and faltering policy credibility. A comprehensive program that tackles all three has a better chance of success than a partial approach, and the advantage of sharing the costs and benefits of reform across government, workers, businesses, and creditors.*

53. **The measures to date are important first steps that need to be built on to deal with a situation years in the making.** Credit must be given to the current administration for putting in place important measures – higher taxes, pension reforms and spending cuts and freezes – to try and stabilize public finances. These measures were necessary but incomplete. The shortcoming has been to view the problem as one of cash flow: if only the Commonwealth had more time and loans, fiscal efforts would turn around confidence and the economy. But the problem of negative growth, a non-starter for debt sustainability, is structural. The problem of the fiscal hole is larger than recognized and set to deteriorate. The problem of policy credibility – from poor fiscal control to inaccurate and dated statistics to lack of political consensus – is as severe as ever.

54. **The debt crisis is not just a fiscal one but also reflects structural problems that have held back growth – both need to be tackled together.** There will be a temptation to focus on the fiscal side because it is more in the administration's direct control. This is not surprising and, indeed, has been the norm in the last decade, which has seen a series of fiscal measures presented as complete answers to the island's ills. Structural reform is harder: explaining that real wages are too high is a hard sell, as is getting the US Congress to exempt Puerto Rico from federal laws that especially disadvantage it (minimum wage, Jones Act, Chapter 9 bankruptcy). Many will dismiss structural reforms as too difficult, too woolly or too long term. But we are convinced that structural reforms are critical to growth, and that without growth, the chances of success are dim. The problems of growth, of credibility, of public debt – all cast a shadow on each other and must be tackled together.

55. **The policy agenda is daunting but similar challenges have been overcome elsewhere and can be in Puerto Rico too.** It will be especially important to establish the credibility of the reform effort early on in the process. This will require up front action and new institutional mechanisms such as a fiscal oversight board. The government should also consider appointing a senior official to coordinate the effort, as well as specific individuals to deliver reforms that would otherwise fall between the cracks in the press of a crisis (e.g., reforms to strengthen the business climate and the provision of data). All this is a heavy lift but also one within the capacity of Puerto Rico to accomplish.



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# Puerto Rico Fiscal and Economic Growth Plan

*Prepared by the Working Group for the Fiscal and Economic Recovery of Puerto Rico Pursuant to Executive Order 2015-022*

September 9, 2015

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# Executive Summary

# Executive Summary

**This document contains the key findings of the Working Group for the Fiscal and Economic Recovery of Puerto Rico (the “Working Group”) established by Governor Alejandro García Padilla by executive order (EO 2015-022), and the measures recommended by the Working Group to reduce the Commonwealth’s projected financing gaps. Such measures comprise the “Fiscal and Economic Growth Plan” or “FEGP”.**

- Despite the significant historical measures undertaken by the Commonwealth since the onset of the financial crisis in 2007 to reduce expenses, increase revenues and address structural challenges, the Working Group projects that, absent meaningful additional fiscal and structural reforms, the consolidated government will incur significant financing gaps for at least the next five years
  - The cumulative financing gap for the Commonwealth is projected to be \$27.8 billion from fiscal year (“FY”) 2016 to FY 2020 absent corrective action
  - In addition, the Puerto Rico Treasury’s single cash account (the “TSA”<sup>(1)</sup>) and the Government Development Bank for Puerto Rico (the “GDB”) are each expected to exhaust their liquidity before the end of calendar year 2015
- In connection with this fiscal and economic emergency, the Working Group and its advisors examined the various causes of the fiscal and economic challenges facing the Commonwealth, and potential reform measures to address these challenges
- Following this review, the Working Group developed the FEGP, setting forth economic development, structural, fiscal and institutional reform measures intended to meaningfully reduce the Commonwealth’s projected financing gaps
  - The Working Group believes that the Commonwealth could reduce its cumulative financing gap by over \$11.9 billion from FY 2016 to FY 2020, through a combination of revenue increases and expense reductions<sup>(2)</sup>
    - ☞ Economic growth, if achieved, could reduce the cumulative financing gap another \$1.9 billion



(1) The TSA account is the account through which General Fund’s (as that term is used in the Commonwealth’s comprehensive annual financial reports) expenses flow as well as certain other governmental funds. It excludes GDB balances and public corporations such as HTA (though certain tax revenues collected by the Commonwealth before transfer to a public corporation do flow through the TSA).

(2) Net of assumed incremental costs associated with these measures.

# Executive Summary

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- In order to ensure compliance with the FEGP measures, the Working Group proposes the implementation of a control board and new budgetary regulations, pursuant to proposed legislation known as the Fiscal Responsibility and Economic Revitalization Act (“FRERA”)
- In addition to the local policy reforms, the Working Group believes that meaningful changes to US federal policies are critical to the ability of the Commonwealth to meet its debt service costs while providing funding for essential services to its residents, most particularly changes in the areas of health care funding and tax policies for economic development. Moreover, the Working Group believes Puerto Rico must have an orderly process to restructure its liabilities
- Even after the implementation of the FEGP, which is subject to significant political and execution risks, the Working Group’s projections suggest that the Commonwealth cannot meet all of its debt service requirements as currently scheduled and must restructure its liabilities
  - After accounting for the estimated impact of all measures *and* including the benefit of potential economic growth spurred by structural reforms, the Working Group still projects the Commonwealth to have a cumulative financing gap from FY 2016 to FY 2020 of \$14 billion
- While the Working Group recognizes that a restructuring of the Commonwealth’s debt would result in hardship to individual bondholders, unless the persistent stagnation of Puerto Rico’s economy that has helped fuel the increase in Government debt over the past decade can be reversed, the public debt is not sustainable
  - Further, paying debt service as currently scheduled in the face of significant financing gaps could severely impair the Commonwealth’s ability to provide essential services to its residents

# Executive Summary

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- As difficult as debt restructuring is likely to be (particularly in the absence of an effective federal or Commonwealth public debt restructuring legal framework), the Working Group recommends that the Commonwealth advisors begin work on a voluntary exchange offer to be made to its creditors as part of the implementation of the FEGP
- The Working Group has directed the Commonwealth’s advisors to take into account the priority accorded to various debt instruments across the Puerto Rico debt complex while recognizing that, even assuming the clawback of revenues supporting certain Commonwealth tax supported debt, available resources may be insufficient to service all principal and interest on debt that has a constitutional priority
- Therefore, a consensual compromise of the creditors’ competing claims to the Commonwealth’s revenues to support debt service will be required in order to avoid a disorderly default on the Commonwealth’s debt and a legal morass that will further destabilize the Commonwealth’s economy and finances
- Accordingly, the Working Group recommends that the Commonwealth advisors meet with the creditor groups that have already been organized (and those that may be formed hereafter) to explain the Fiscal and Economic Growth Plan and to begin negotiation of the terms of a voluntary exchange offer that can garner widespread creditor acceptance
- **It is the Working Group’s belief that a voluntary adjustment of the terms of the Commonwealth’s debt that allows the measures contained in the FEGP to be implemented is the best way to maximize all creditor recoveries**



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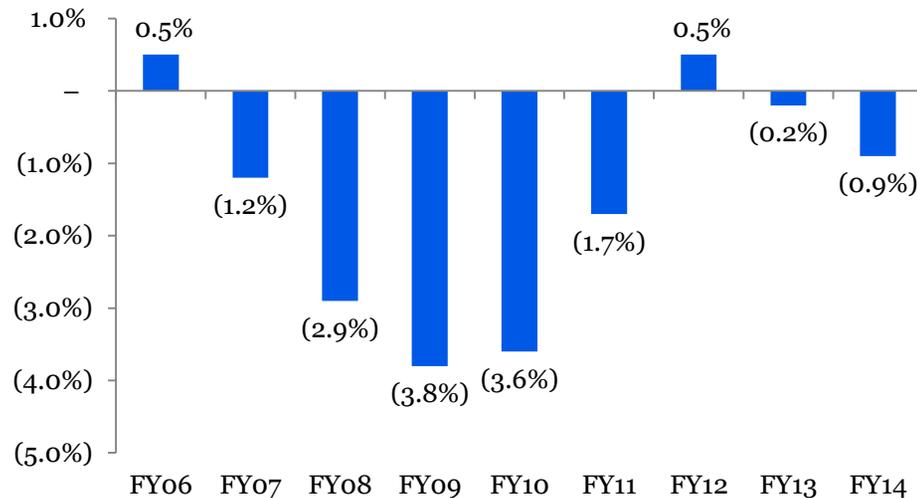
# Historical Reform Measures and Current Liquidity and Fiscal Position

# Economic Decline of Puerto Rico

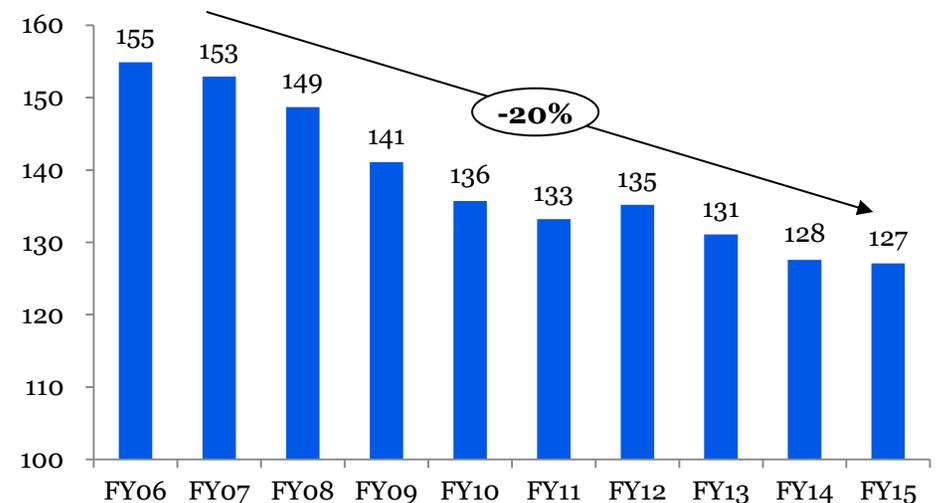
Since the expiration of Section 936 of the US Internal Revenue Code in 2006<sup>(1)</sup> and the onset of the global financial crisis in 2007, the Commonwealth has faced virtually continuous economic decline, in spite of substantial stimulus spending

- GNP growth has been negative nearly every year since FY 2007; little growth was recorded in the prior decade
- The lower rate of GNP decline since FY 2009 is due in large part to the large amount of stimulus and deficit spending injected into Puerto Rico's economy during the same period
  - For example, the Commonwealth was allocated approximately \$7.1 billion of funds through the American Recovery and Reinvestment Act ("ARRA") and, using the Puerto Rico Sales Tax Financing Corporation ("COFINA") bond proceeds from offerings in 2009 and 2010, the Commonwealth created a \$500 million "Local Stimulus Fund"
  - Furthermore, tax reform enacted in 2011 sought to jumpstart the economy by reducing individual and corporate taxes by approximately \$706 million, some of the provisions of which were later modified to deal with resulting revenue shortfalls

Real GNP Growth<sup>(2)</sup>



GDB EAI Index<sup>(2)(3)</sup>



(1) Insofar as is relevant to Puerto Rico, Section 936 of the US Internal Revenue Code exempted from US taxation certain income derived by US companies from the active conduct of a trade or business in Puerto Rico and certain Puerto Rico sourced investment income.

(2) Source: Economic Activity Index ("GDB – EAI") report for June 2015.

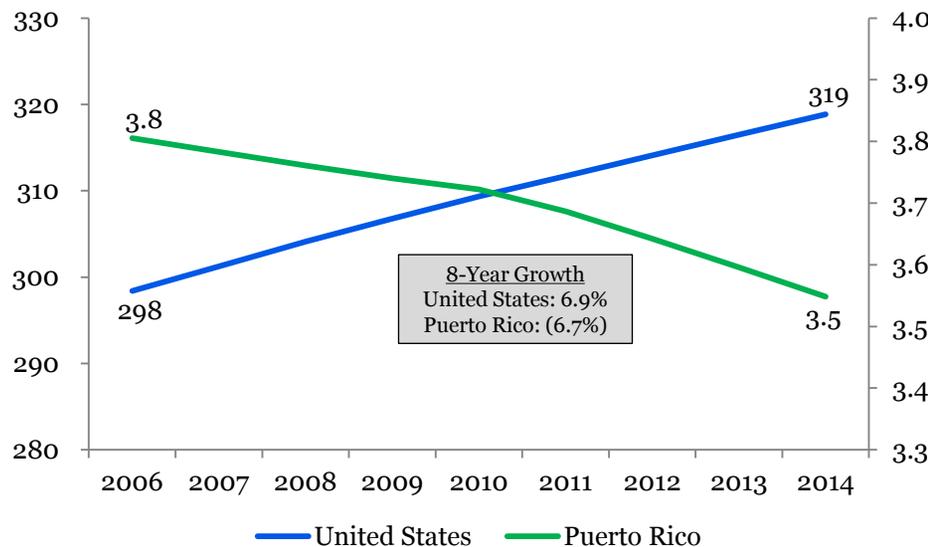
(3) Values are as of June 30 of each year. The apex in FY 2006 occurred at 158.0 in July. EAI is comprised of four indicators: total payroll employment; total electric power generation; cement sales and gas consumption. The index is highly correlated to Puerto Rico's real GNP. For additional details on the EAI, see the GDB website under "Economy."

# Deteriorating Economic Prospects & Demographic Trends

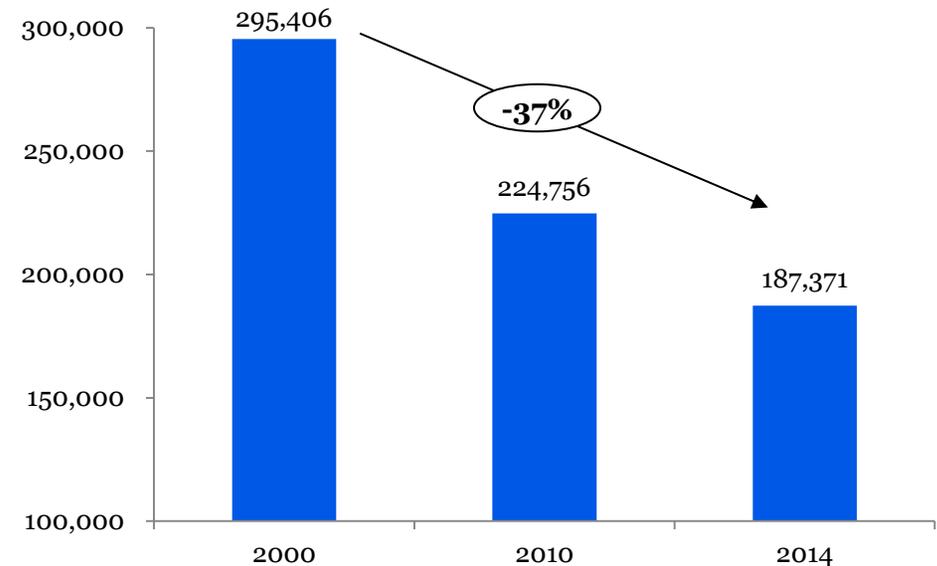
## Reduced economic activity has had a marked effect on the residents of the Commonwealth, leading to stagnating incomes and increasing outmigration to the mainland

- As multinational corporations moved out of the Commonwealth following the expiration of Section 936 and without substantial job creation, cumulative per capita income growth of 5.5%<sup>(1)</sup> from 2006 to 2013 has failed to keep pace with cumulative inflation of ~15%<sup>(2)</sup> over the same time period
- Deteriorating economic conditions have therefore led to many Puerto Ricans emigrating to the mainland
- The Commonwealth averaged net outmigration of approximately 48,000 residents per year from 2010 to 2013<sup>(3)</sup>, with 42% of emigrants stating that their primary reason for moving was job-related; in 2013, approximately 74,000 residents emigrated to the mainland<sup>(4)</sup>
- The remaining population is also becoming increasingly elderly and outside the labor force
  - Persons 60 years and older represent more than 20% of the population (the highest in the United States) and their labor participation rates range from 10.7% to 13.3%<sup>(5)</sup>; children aged five years or less have decreased from 295,406 in 2000 to approximately 187,371 in 2014, a reduction of 37%<sup>(6)</sup>

Population Data (millions)<sup>(6)</sup>



Population Under Age Five<sup>(6)</sup>



(1) Per capita income from World Bank. 2013 is the most recent year for which data is available for both Puerto Rico and the US.  
 (2) Inflation calculated using CPI as presented by GDB and sourced to Dept. of Labor and Human Resources.  
 (3) Puerto Rican Population Declines on Island, Grows on US Mainland, Pew Research Center, August 11, 2014.

(4) Puerto Rico Statistics Institute, "Perfil del Migrante 2013", February 8, 2015.  
 (5) Puerto Rico Planning Board, "Resumen Economico de Puerto Rico", December 2013.  
 (6) US Census Bureau.

# Significant Fiscal Responsibility Measures

## The Commonwealth has repeatedly taken difficult measures to reduce its consolidated financing gaps

- The following chart represents a select subset of the various measures that the Commonwealth has taken since the onset of the economic crisis

Revenues	Expenditures	Other Fiscal Responsibility Measures
<b>2007:</b> 7% Sales and Use Tax (“SUT”) implemented ~\$1.1bn per year	<b>2010:</b> Voluntary resignation and work-day reduction programs ~\$91mm	<b>2011:</b> Gradually increase employer contribution to ERS from 9.275% to 20.525%
<b>2011:</b> Act 154-2011 institutes annually declining 4% excise tax on multinationals operating in Puerto Rico ~\$1.9bn per year	<b>2010:</b> Temporary suspension of certain laws, collective bargaining agreements and other contractual agreements ~\$187mm	<b>2011:</b> Gradually increase employer contribution to TRS from 8.5% to 19.75% per employee
<b>2011:</b> UPR <sup>(1)</sup> stabilization fee ~\$40mm per year (later repealed)	<b>2011:</b> Involuntary layoffs ~\$367mm	<b>2011:</b> Complete public-private partnership (“P3”) of PR-22
<b>2013:</b> Act 154 excise tax reset at 4% rate	<b>2013:</b> Eliminate subsidies to PRASA <sup>(2)</sup> (due to PRASA rate increase) ~\$340mm	<b>2013:</b> Complete P3 of LMM International Airport
<b>2013:</b> Petroleum products tax increase from \$3.00 to \$9.25 per barrel ~\$190mm per year	<b>2014:</b> Reduction in non-salary benefits ~\$51mm (prohibited December bonus above \$600 and liquidations of unused vacation or sick leave); government merit bonuses eliminated	<b>2013:</b> Increase employee contribution to ERS <sup>(3)</sup> from 8% to 10%; eliminate special law benefits to ERS retirees; increase retirement age
<b>2014:</b> Gross profits tax on corporations ~\$300mm per year	<b>2014:</b> Judicial and legislative budget reductions ~\$45mm	<b>2013:</b> Increase employee contribution to TRS <sup>(4)</sup> from 9% to ~13%; eliminate special law benefits to TRS retirees; increase retirement age (ruled unconstitutional in part)
<b>2014:</b> SUT charged at point of entry ~\$70mm per year	<b>2014:</b> UPR, Judicial and Municipality appropriation levels frozen from 2015-2017; CBA salary increases frozen	<b>2013:</b> Eliminate “scoop and toss” <sup>(5)</sup> of PBA <sup>(6)</sup> debt service (\$175mm in FY 2013)
<b>2015:</b> Petroleum products tax raised from \$9.25 to \$15.50 per barrel, providing an incremental ~\$170mm per year	<b>2015:</b> School transportation cost reductions and school consolidations ~\$110mm	<b>2014:</b> Eliminate “scoop and toss” <sup>(5)</sup> of GO <sup>(7)</sup> debt service (\$575mm in FY 2014)
<b>2016:</b> SUT increased from 7% to 11.5% and VAT <sup>(8)</sup> instituted; projected ~\$1.1-\$1.3bn per year	<b>2013-2015:</b> 3% annual payroll reduction	<b>2014:</b> Prohibit deficit financings by GDB



- (1) University of Puerto Rico (“UPR”).  
 (2) Puerto Rico Aqueduct and Sewer Authority (“PRASA”).  
 (3) Employees Retirement System (“ERS”).  
 (4) Teachers Retirement System (“TRS”).

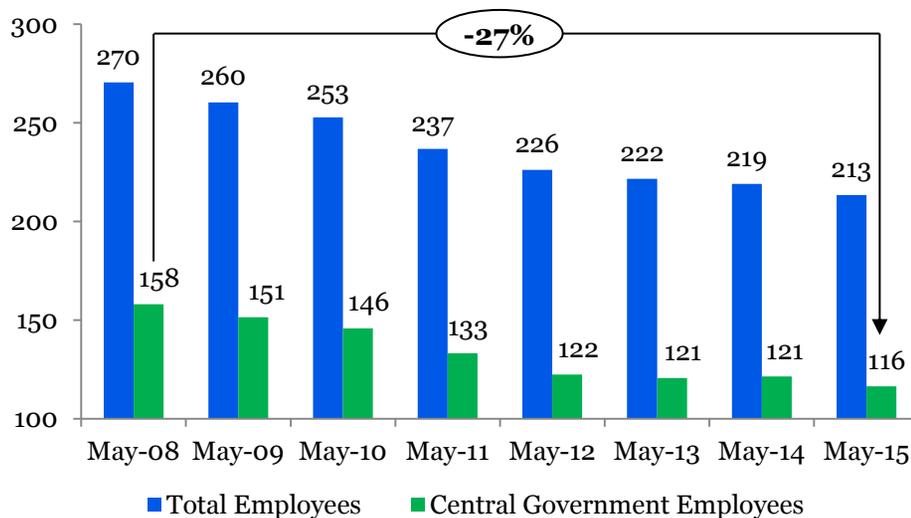
- (5) “Scoop and Toss” generally refers to the elimination of annual debt principal and interest through a refinancing with delayed payment dates.  
 (6) Public Buildings Authority (“PBA”).  
 (7) General Obligation (“GO”).  
 (8) Value Added Tax (“VAT”).

# Select Results of Historical Measures to Date

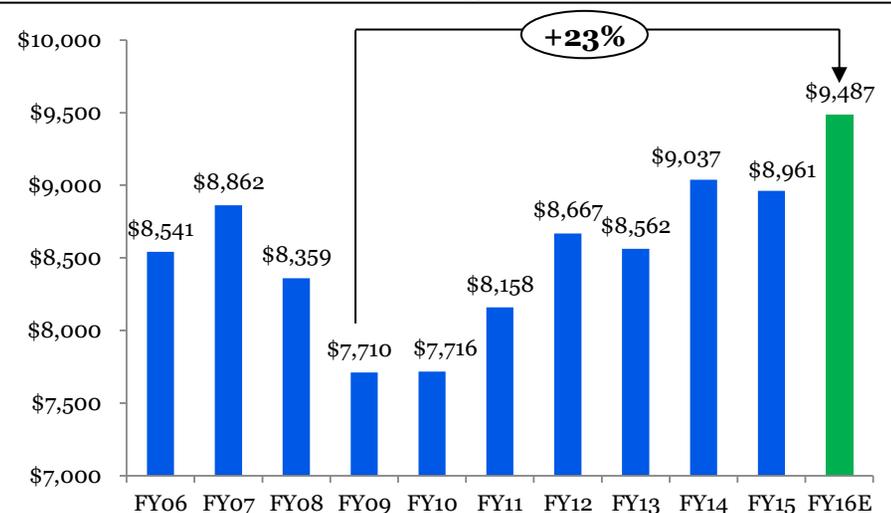
**As a result of the Commonwealth's expense reduction measures, central government employee headcount is down 27% (4.3% compounded annual decline) since 2008; further, revenue measures have allowed projected General Fund revenues for FY 2016 to grow by 23% since a recession low in FY 2009**

- Note that the General Fund revenue numbers shown below do not account for the incremental revenues that were also added at PRASA (through a rate increase), Puerto Rico Highways and Transportation Authority ("HTA") (through increased petroleum products taxes), Puerto Rico Infrastructure Financing Authority ("PRIFA") (also through petroleum products taxes) and other entities on the island which received governmental subsidies from the General Fund or GDB
- According to US Government Accountability Office, in 2012 government employment as a share of the population was 8.7% in Puerto Rico vs. 8.9% in the states<sup>(1)</sup>. Since 2012 there has been a further reduction of approximately 13,000 in the number of Puerto Rican government employees through attrition

Government Employee Headcount Reduction<sup>(2)</sup> (thousands)



General Fund Revenues<sup>(3)(4)</sup> (\$ millions)



(1) US Government Accountability Office, Information on How Statehood would Potentially Affect Selected Federal Programs and Revenue Sources, March 2014.

(2) Source: Puerto Rico Statistics Institute, May 2015 Employment Report. Central government employees include Office of the Governor, Departments and Agencies, Judicial Branch and Legislative Branch as described in the report.

(3) Source: Puerto Rico Treasury website. Note that the numbers shown correspond to "Total Revenues" and not "Total Budgetary Revenues." See page 100 of the Commonwealth's Financial Information and Operating Data Report from October 30, 2014 for a historical reconciliation of "Total Revenues" to "Total Budgetary Revenues."

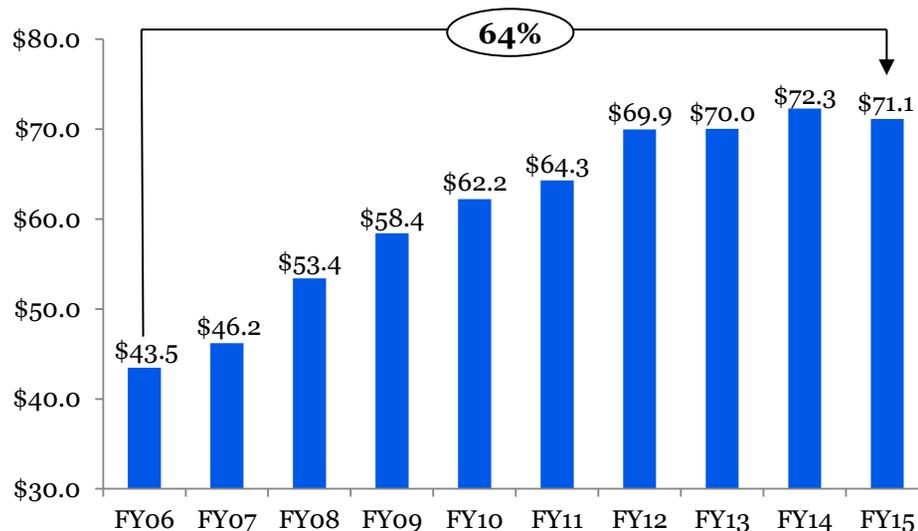
(4) FY 2016 General Fund revenue represents projections based on the work of Conway MacKenzie ("CM") and is inclusive of incremental SUT/VAT taxes projected to be collected on account of tax reform.

# Debt Accumulation

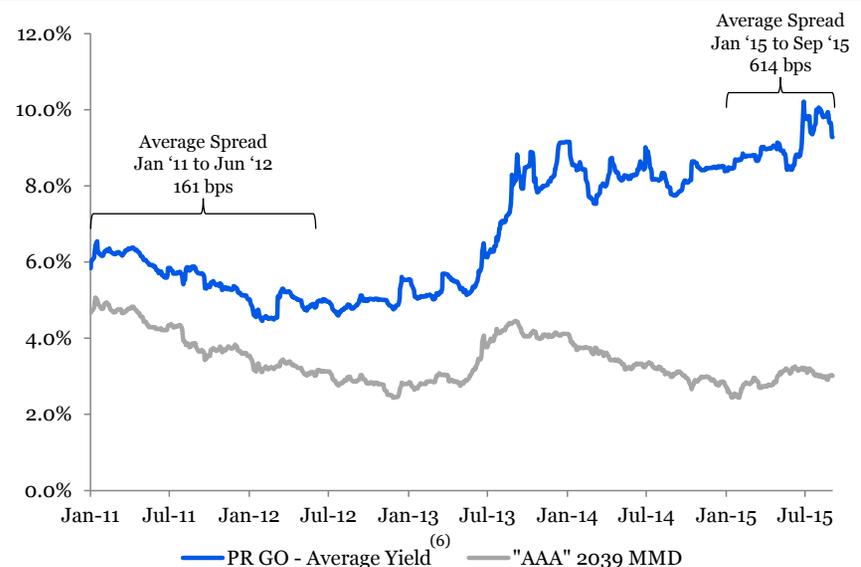
## Notwithstanding the Commonwealth's liquidity-enhancing measures, total debt has grown by approximately 64% since FY 2006

- This rising debt burden has increased total debt financing costs and has resulted in an increasing percentage of the budget being redirected from investment and essential services to debt service
- Increased financing costs are reflected in the rising yields of Puerto Rico GO bonds as compared to similar municipal bonds
  - Whereas in 2006, GO bonds with 20 years to maturity were priced to yield 4.8%, the March 2014 GOs due in 2035 (approximately 20 years to maturity) were issued to yield 8.7% and currently yield 11.3%<sup>(1)</sup>
- Given these yields, market access on sustainable terms is not currently available to the Commonwealth

Historical Public Sector Debt<sup>(2)(3)(4)</sup> (\$ billions)



Puerto Rico GO Yields vs. 2039 MMD<sup>(5)</sup>



(1) Yield on 2006 issuance from Public Improvement Bonds of 2006, Series A Offering Statement and 2014 GO current yield from Bloomberg.

(2) For more detail see the appendix for total public sector debt as of June 30, 2015. Data per GDB.

(3) Balances shown do not include the accreted value of capital appreciation bonds ("CABs"). As of July 1, 2015, the incremental accreted value of the CABs was \$2.6 billion, with another \$31.3 billion of accretion remaining.

(4) Does not include unfunded pension liabilities. Based on preliminary valuation reports as of June 30, 2014, the Employees Retirement System, Teachers Retirement System and Judiciary Retirement System ("JRS") net pension liabilities were \$30 billion, \$13 billion and \$442 million, respectively. See the May 7, 2015 Commonwealth of Puerto Rico Quarterly Report for more details.

(5) Puerto Rico GO bond valuation from Standard & Poor's (J.J. Kenny Evaluated Pricing Service). "AAA" MMD based on 2039 maturity, which was chosen as the benchmark as it is within the maturity range of the uninsured PR GO bonds included.

(6) Simple average of the historical Standard & Poor's (J.J. Kenny Evaluated Pricing Service) valuations for seven long-duration, tax-exempt, uninsured, current interest PR GO Bonds (CUSIPs: 74514LB71, 74514LB89, 74514LE86, 74514LWA1, 74514LKE6, 74514LXH5, 74514LYW1).

# Extraordinary Liquidity Measures Taken in FY 2016

Despite historical attempts to strengthen the Commonwealth's liquidity, the TSA account would have exhausted its liquidity had certain extraordinary liquidity measures not been taken for FY 2016, including:

- Funding \$400 million of its working capital needs through emergency “intra-governmental” loans funded by requiring its proprietary insurance companies to liquidate their securities portfolios<sup>(1)</sup>;
- Withholding GO set asides totaling approximately \$93 million per month;
- Requiring its insolvent pension systems to pre-fund benefit payments to retirees, which improved cash flow by approximately \$295.0 million in July 2015 and an expected \$141.0 million in each of October 2015, December 2015 and February 2016;
- Having GDB refinance the 2015 C-Series tax revenue anticipation notes (“TRANS”) (\$300 million) in July 2015, notwithstanding GDB's fragile liquidity position; and
- Delaying payment of approximately \$291.0 million in income tax refunds from the 2014 tax year
  - ↳ These refunds will not be paid in full until February 2016, at the earliest
- Moreover, the measures described on the following page do not account for any shortening of outstanding days payable to third parties that today exceed \$1.6 billion at Commonwealth agencies (excludes amounts owed by public corporations and agencies with independent treasuries)<sup>(2)</sup>
- **These extraordinary liquidity measures cannot be maintained on a long-term basis**

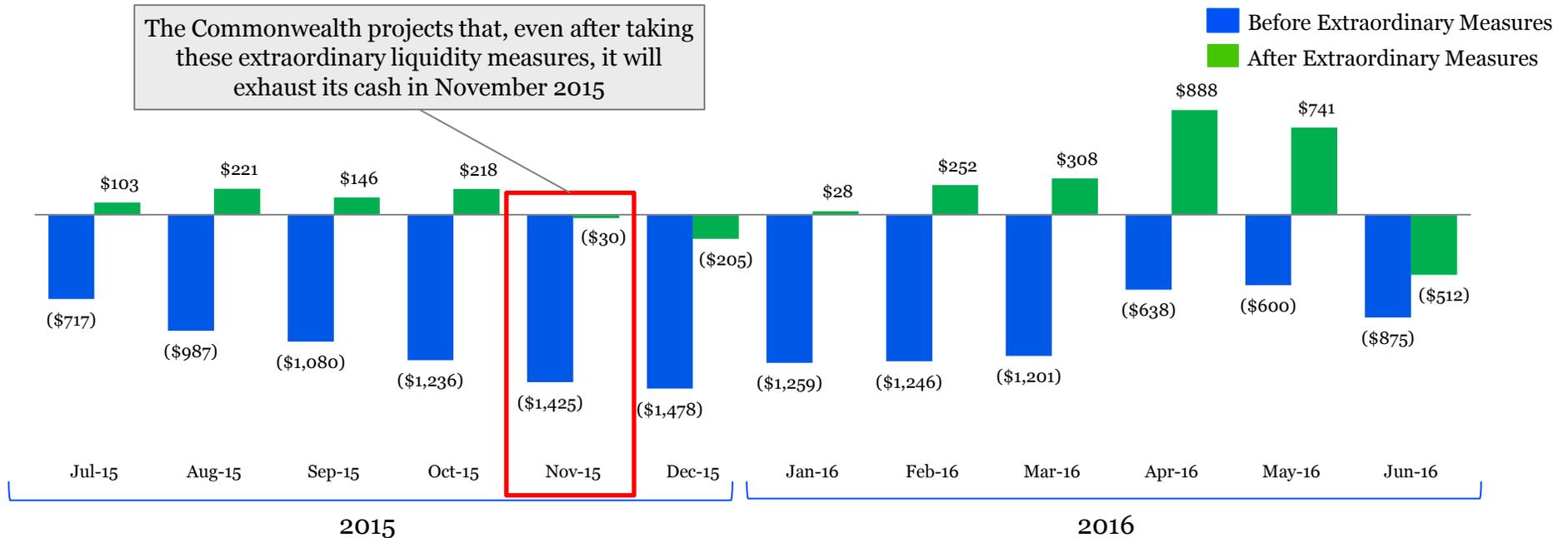
(1) Proprietary insurance companies include State Insurance Fund (“SIF”), Automobile Accidents Compensation Administration (“ACAA”) and Temporary Non-Occupational Incapacity Insurance (“SINOT”).

(2) Based on preliminary estimates subject to material revision; moreover, may not account for all payables as there is typically a substantial lag between the incurrence of an expense and that expense being recorded.

# Projected Near-Term TSA Liquidity

**Absent the Commonwealth's extraordinary and unsustainable liquidity measures described on the previous page, the TSA would have already exhausted its cash**

Projected TSA Liquidity – Ending Cash Balance <sup>(1)(2)</sup> (\$ millions)



- GDB cannot be a source of liquidity for the Commonwealth or the public corporations
  - As of May 31, 2015, GDB had \$778 million of total net liquidity, which is before any reduction for GDB's minimum liquidity requirement
  - During FY 2016, GDB has \$876 million of maturing notes, \$267 million of which are GO guaranteed (the payment of which is not included in the TSA projections above), and \$188 million of interest due

(1) Defined in the August 25, 2015 report Commonwealth of Puerto Rico: Conway MacKenzie Liquidity Update as cash in the bank and does not reflect outstanding checks, which may represent a substantial amount.

(2) Projections do not assume any working capital impact from a reduction in days payable outstanding to trade creditors or a catch-up in the payment of overdue tax refunds.

# Overview of Commonwealth Projected Financing Gaps

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**Building on the work done in the report *Puerto Rico – A Way Forward*, updated as of July 13, 2015 (the “Krueger Report”), the Working Group developed a revised view of the future Commonwealth financing gaps (the revised view constituting the “Adjusted Estimates”)**

- As explained in the Krueger Report, which was authored by a team of former International Monetary Fund economists headed by Anne Krueger, the General Fund alone (which is the primary account associated with the TSA presented on the previous page) does not adequately capture the total financing needs of the Commonwealth
- The Working Group adopted the comprehensive approach outlined in the Krueger Report, along with many of the same key assumptions, such as an assumed baseline for real economic growth of negative 1%
- While the general approach to the financing gap projections is the same as in the Krueger Report, the Working Group conducted its own diligence and refined certain estimates based in large part on information that was not available at the time the Krueger Report was prepared
- These updates include:
  - Updated revenue projections that incorporate preliminary actual results from 2015
  - Updated component unit projections based on detailed work undertaken by the Working Group and its advisors (the Krueger Report did not have detailed individual unit projections)
  - Revised estimates of budgeted expenses and the resultant impact of Act 66
  - Revised capital expenditure estimates

# Overview of Commonwealth Projected Financing Gaps

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- In addition to these updates, the Adjusted Estimates include two changes to the approach taken in the Krueger Report:
  - HTA is now included in the projections, due to its reliance on taxes collected by the Commonwealth and the Commonwealth's support of HTA historically through the assignment of new revenue sources and the provision of over \$2 billion of loans from GDB
  - Rather than showing estimates of retirement system shortfalls once they were projected to take place, the FEGP assumes the Commonwealth makes the additional uniform contribution (the "AUC") required by Act 3-2013 and Act 160-2013 to prevent full asset depletion. Both the Krueger Report and the Adjusted Estimates show the financing gap effectively assuming no interruption of current benefits<sup>(1)</sup>
- Additional details on the variances of the Adjusted Estimates to the Krueger Report are available in the appendix

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(1) See the appendix for additional details on assumed asset balances in the retirement systems.

# Projected Financing Gaps Based on Adjusted Estimates

The Working Group's revised projections indicate that the Commonwealth as a whole will face significant financing gaps for at least the next five years, absent additional measures

Central Government Outlook (\$ millions)	2016P	2017P	2018P	2019P	2020P	Total
<b>Revenues</b>						
General Fund and Other Select Revenues <sup>(1)</sup>	\$8,503	\$8,519	\$8,561	\$8,604	\$8,648	\$42,835
GDB Net Operating Revenue <sup>(2)</sup>	(96)	(21)	248	307	269	706
COFINA <sup>(3)</sup>	696	724	753	783	815	3,771
Federal Transfers <sup>(4)</sup>	6,477	6,540	6,604	6,669	6,734	33,025
HTA Revenues <sup>(5)</sup>	677	636	643	645	648	3,249
<b>Total Revenue</b>	<b>16,257</b>	<b>16,399</b>	<b>16,809</b>	<b>17,009</b>	<b>17,114</b>	<b>83,587</b>
<b>Noninterest Expenditure</b>						
General Fund Budget (ex. Debt Service and Additional Uniform Contributions) <sup>(6)</sup>	(7,957)	(8,251)	(8,697)	(9,236)	(9,614)	(43,756)
Additional Uniform Contribution and Catch-up <sup>(7)</sup>	(314)	(299)	(300)	(797)	(798)	(2,509)
Net Operating Deficit of Non-General Fund Governmental Funds <sup>(8)</sup>	(235)	(237)	(240)	(242)	(244)	(1,199)
Net Operating Deficit (Surplus) of Component Units (ex. Capex and ACA Loss Impacts) <sup>(9)</sup>	(120)	59	(101)	192	324	354
Capital Expenditures <sup>(10)</sup>	(386)	(585)	(545)	(503)	(338)	(2,358)
Federal Programs <sup>(11)</sup>	(6,477)	(6,540)	(6,604)	(6,669)	(6,734)	(33,025)
HTA Expenditures (ex. Debt Service and Capex) <sup>(12)</sup>	(279)	(189)	(149)	(150)	(151)	(918)
<b>Total Noninterest Expenditure</b>	<b>(15,769)</b>	<b>(16,044)</b>	<b>(16,636)</b>	<b>(17,405)</b>	<b>(17,556)</b>	<b>(83,410)</b>
<b>Additional Expenses Based on Current Policies</b>						
Loss of Affordable Care Act ("ACA") Funding <sup>(13)</sup>	–	–	(526)	(1,597)	(1,730)	(3,853)
Act 154 / Foreign Company Tax Losses <sup>(14)</sup>	–	–	(538)	(1,075)	(1,075)	(2,688)
<b>Total Additional Expenses Based on Current Policies</b>	<b>–</b>	<b>–</b>	<b>(1,064)</b>	<b>(2,672)</b>	<b>(2,805)</b>	<b>(6,541)</b>
<b>Debt Service</b>						
Consolidated Interest <sup>(15)</sup>	(2,320)	(2,370)	(2,320)	(2,239)	(2,170)	(11,419)
Consolidated Principal <sup>(15)</sup>	(1,810)	(1,044)	(957)	(1,628)	(1,299)	(6,738)
<b>Total Debt Service</b>	<b>(4,130)</b>	<b>(3,415)</b>	<b>(3,277)</b>	<b>(3,867)</b>	<b>(3,469)</b>	<b>(18,157)</b>
<b>Identified Financing Sources (Uses)</b>						
Change in Stock of Payables <sup>(16)</sup>	–	(827)	(501)	(501)	(501)	(2,331)
Net Deposit Draw/(Replenishment) <sup>(17)</sup>	(538)	(500)	–	–	–	(1,038)
Inflows from Other Entities <sup>(18)</sup>	105	–	–	–	–	105
<b>Identified Financing Sources (Uses)</b>	<b>(433)</b>	<b>(1,327)</b>	<b>(501)</b>	<b>(501)</b>	<b>(501)</b>	<b>(3,264)</b>
<b>Total Estimated Financing Gap before Measures</b>	<b>(\$4,075)</b>	<b>(\$4,386)</b>	<b>(\$4,670)</b>	<b>(\$7,437)</b>	<b>(\$7,217)</b>	<b>(\$27,786)</b>
<i>Memo: Debt Service as a % of Total Revenue ex. Federal Transfers<sup>(19)</sup></i>	42%	35%	32%	37%	33%	36%

Note: Revenues do not include any incremental tax revenues attributable to the increased SUT or transition to the VAT which would reduce the projected financing gap by \$6.350 billion (See page 56). For footnotes and additional details on the projections included herein, please see the appendix.



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# Fiscal and Economic Growth Measures

# Scope & Process of the Fiscal and Economic Growth Plan

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**In order to address the challenges facing the Commonwealth, Governor García Padilla tasked the Working Group to develop a Fiscal and Economic Growth Plan**

- The creation of the Working Group was in direct response to the Krueger Report regarding the fiscal and economic situation of the Commonwealth and the sustainability of its debt
- The Governor's executive order mandates that the Working Group evaluate the measures outlined in the Krueger Report and ultimately design a plan to address short and long-term fiscal challenges facing the Commonwealth by recommending measures to:
  - Address financing gaps and the debt load;
  - Ensure budget compliance;
  - Provide greater financial transparency; and
  - Carry out structural reforms necessary to restore economic competitiveness and growth
- The Working Group, in conjunction with its advisors, conducted due diligence on various Commonwealth funds, agencies and public corporations that are supported by taxes and appropriations and contributed to the fiscal deficits identified in the Krueger Report, in order to create a holistic projection of Commonwealth finances
- After identifying and estimating key contributors to historical and future Commonwealth-wide deficits, the Working Group also examined various measures outlined on the following pages that will help address the financing gaps identified in the Krueger Report

# FEGP Measures

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*“The situation is acute in the face of faltering economic activity, faltering fiscal and debt sustainability, and faltering policy credibility. A comprehensive program that tackles all three has a better chance of success than a partial approach, and the advantage of sharing the costs and benefits of reform across government, workers, businesses, and creditors.” –The Krueger Report p.26*

## 1. Economic Growth and Structural Reform

- 1.1 Stimulate Employment and Labor Force Participation
- 1.2 Diversify Fuel Base and Stabilize Energy Rates
- 1.3 Implement Pro-Growth Corporate Tax Regime
- 1.4 Reduce Costs and Improve Ease of Doing Business
- 1.5 Invest in Strategic Infrastructure

## 2. Fiscal Stability

### Revenue Enhancing Measures

- 2.1 Complete Transition to VAT
- 2.2 Stabilize Corporate Tax Revenue Base
- 2.3 Improve Tax Administration and Enforcement

### Expense Reduction Measures

- 2.4 Reduce Operating Costs
- 2.5 Cut Governmental Subsidies
- 2.6 Right-Size Department of Education
- 2.7 Control Health Care Costs
- 2.8 Leverage P3s to Deliver Quality and Cost-Efficient Services

## 3. Institutional Reform and Transparency

- 3.1 Install New Accounting and Financial Systems
- 3.2 Establish Centralized Treasury Functions
- 3.3 Improve Fiscal and Economic Decision-Making
- 3.4 Implement New Budgetary Rules
- 3.5 Institute Control Board for Policy Continuity and Compliance

# Economic Growth and Structural Reform

*“Restoring growth requires restoring competitiveness. Key here is local and federal action to lower labor costs gradually and encourage employment (minimum wage, labor laws, and welfare reform), and to cut the very high cost of electricity and transportation (Jones Act). Local laws that raise input costs should be liberalized and obstacles to the ease of doing business removed.” – The Krueger Report p. 1*

## Economic Growth and Structural Measures

Target Date

### 1.1 Stimulate Employment and Labor Force Participation

**Only 40% of Puerto Rico’s adult population (vs. 63% in the US) is employed or looking for work.** A significant portion of the population is either receiving welfare, informally employed or both. The Commonwealth must **adopt pro-growth labor market policies, reform welfare programs and determine policy with respect to its minimum wage**

#### Private Sector Labor Reform

January 2016

- Enact legislation to reform current labor laws to incentivize growth and boost labor participation
  - Establish a uniform work day and enable employers to provide flexible work week schedule
    - 8-hour work day based on calendar days, not consecutive 24 hour periods
    - Provide option for overtime to be calculated based on hours worked in excess of 40 hours per week, not in excess of 8 hours per day
  - Incentivize businesses, including small and medium enterprises (“SMEs”), to expand job opportunities
    - Ease December bonus payment waiver process
    - To incentivize youth employment and reverse emigration trends, make discretionary December bonus payment to employees 25 and under
    - Modify mandatory vacation days for all new hires based on sliding scale tiered off an employee’s years of employment
    - Extend employment probation period to one year

# Economic Growth and Structural Reform

## Economic Growth and Structural Measures

## Target Date

### 1.1 Stimulate Employment and Labor Force Participation (cont.)

- Reform mandatory severance; allow performance-based retention
  - Apply Act 80-1976 only to “non-exempt” employees
  - Limit mandatory severance pay at six months; exclude non-cash benefits from severance calculations
  - Allow businesses to retain employees based on performance in the event of a downsizing or reorganization of operations
- Simplify and make uniform other labor market regulations, including establishing a one-year uniform statute of limitations for labor claims
- Create maternal benefits fund, funded by employer premiums, to reduce incentives for discrimination and increase labor participation while maintaining current maternity benefit level

January 2016

### Welfare Reform and Stimulating Work

- Establish an Earned Income Tax Credit (“EITC”)
  - Establish an EITC that, like the federal EITC, targets families with children, headed by working age persons, to stimulate employment among low-wage workers, reduce informal economy activities, bring families into the tax system and offset sales tax regressivity
    - ❖ Cost after full implementation will be ~\$150 million per year
    - ❖ Former Commonwealth EITC program (2006-2014) did not differentiate among claimants by filing status, presence of dependents or age of the tax filers
- Reform Nutritional Assistance Program (“NAP”) Benefits
  - Request US Department of Agriculture (“USDA”) to extend gross income exception for the receipt of NAP benefits from 12 to 18 months to allow more time for employees to experience salary and benefits increases that outweigh loss of NAP benefits
  - Modify NAP income thresholds for the Commonwealth so that program participants experience a more gradual and income-targeted reduction in NAP benefits when entering the workforce to eliminate the current cliff effect on benefit reduction

March 2016

March 2016

# Economic Growth and Structural Reform

## Economic Growth and Structural Measures

## Target Date

### 1.1 Stimulate Employment and Labor Force Participation (cont.)

- Public Housing and Section 8
  - Apply to US Department of Housing and Urban Development (“HUD”)’s “Moving to Work” program to receive waivers of rules that govern public housing and federal Section 8 voucher program
    - ❖ Program’s goal is to give incentives to families with children, where the head of household is working, seeking work, or is preparing for work to obtain employment, becomes economically self-sufficient and increase housing choices for low income families
      - After receiving waiver, local Housing Department to develop rent structures that allow residents to increase their earnings through work without penalty
  - Apply to HUD’s “Jobs Plus Pilot Program”
    - ❖ Program incentivizes employment through income-disregards for working families, and provides a set of services designed to support work including employer linkages, job placement and counseling, educational advancement, and financial counseling
  
- Integrate Childcare Services
  - Integrate Family Department’s child care and Head Start programs with the Puerto Rico Department of Education’s Pre-K program in local public schools in order to reduce transportation costs for working families with multiple children and provide such families with full day childcare options
    - ❖ Cost of program under evaluation

### Minimum Wage

- To promote the hiring of young workers, request Congress to grant a 10-year waiver from future minimum wage increases for workers aged 25 and younger. This increase to the minimum wage would apply to any individual worker after 2 years
  
- Grant the petition by the Commonwealth to exempt Puerto Rico from the US Department of Labor proposal to increase the salary level for required exemption under the Fair Labor Standards Act (“FLSA”) referred to as “EAP” or “white collar” exception, which would increase the salary threshold for exempt employees that are full time salaried employees to \$50,440 annually

# Economic Growth and Structural Reform

## Economic Growth and Structural Measures

## Target Date

### 1.2 Diversify Fuel Base and Stabilize Energy Rates

Lack of fuel diversification, mismanagement and lack of energy policy continuity have resulted in **high energy costs, eroding the Commonwealth's competitiveness** and increasing the cost of doing business

- Complete restructuring of Puerto Rico Electric Power Authority's ("PREPA") capital structure and operations to produce cash flow relief during next five years to invest in necessary infrastructure and stabilize rates To be determined

  - ❖ On September 1, 2015, PREPA announced that it had reached an agreement in principle with the Ad Hoc Group of PREPA bondholders – comprised of traditional municipal bond investors and hedge funds that hold approximately 35% of PREPA's outstanding bonds – regarding the economic terms of a restructuring of a significant portion of PREPA's bond debt. PREPA's agreement with the Ad Hoc Group marks PREPA's first agreement with a significant financial stakeholder regarding the substantive terms of its financial transformation. PREPA will continue negotiating with its financial guaranty bond insurers and revolving fuel line lenders, with the goal of reaching an agreement on a consensual recovery plan among all of its major financial stakeholders
  
- Issue request for proposal ("RFP") to third-party investors to upgrade existing generation capacity and build new, more efficient generation plants, allowing PREPA to transition into a transmission and distribution company 2016 <sup>(1)</sup>
  
- Depoliticize PREPA by attracting professional external management and directors 2016 <sup>(1)</sup>
  
- PREPA to invest more than \$2 billion over the next five years to upgrade vital generation, transmission and distribution infrastructure 2015-2020

(1) Contingent on timing of PREPA's restructuring.

# Economic Growth and Structural Reform

## Economic Growth and Structural Measures

## Target Date

### 1.3 Implement Pro-Growth Corporate Tax Regime

The Commonwealth's current corporate tax regime is too complex, distorts economic choices and produces horizontal inequities. Puerto Rico must **institute a pro-growth tax regime** applicable to all companies doing business on the island that **lowers nominal tax rates and eliminates loopholes and unnecessary complexity**

- Enact legislation to amend Puerto Rico's Internal Revenue Code to implement flatter, lower-rate corporate tax regime for both new and existing companies March 2016
  - Reduce nominal corporate tax rates
  - Eliminate inefficient corporate deductions and tax credits; eliminate or reduce alternative minimum tax
    - ❖ Simplified corporate tax regime would reduce unnecessary compliance burdens on entrepreneurs
  
- Enact legislation, after dialogue with existing multinationals, to retain and attract foreign direct investment March 2016
  - Legislation would amend Act 154-2011 to extend the 4% excise tax for an additional 5-year period to stabilize the General Fund's revenue base<sup>(1)</sup>
  - With respect to foreign multinationals, legislation would also amend Act 73-2008 and be applicable to new companies coming to Puerto Rico, existing companies wishing to convert to new tax regime and all firms after the expiration of their current tax grants
  - New regime would seek to substitute Act 154-2011 excise tax and its revenues without increasing overall tax liability to existing companies, including foreign companies that currently do not credit the excise tax against federal income

(1) For Act 154 extension 5-year revenue projections, please refer to measure 2.2 of the Fiscal Stability section.

# Economic Growth and Structural Reform

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## Economic Growth and Structural Measures

## Target Date

### 1.3 Implement Pro-Growth Corporate Tax Regime (cont.)

- Request Congress to provide Puerto Rico with tax treatment that encourages US investment on the island, such as:
  - Section 933A: Amend US Internal Revenue Code to add new Section 933A to permit US-owned businesses in Puerto Rico to elect to be treated as US domestic corporations
  - Economic Activity Tax Credit: Enact an economic activity tax credit for US investment in Puerto Rico designed as a targeted, cost-efficient version of former Section 936 of the US Internal Revenue Code
  - Base Erosion: In the event the US moves towards a territorial taxation system, exempt Puerto Rico from base erosion and/or minimum tax measures

November 2015

# Economic Growth and Structural Reform

## Economic Growth and Structural Measures

## Target Date

### 1.4 Reduce Costs and Improve Ease of Doing Business

**Puerto Rico has been losing competitiveness** as measured by global reports produced by the World Economic Forum and the World Bank. To jumpstart its economy, **Puerto Rico must be equipped with a business-friendly environment that is conducive to sustained economic growth**

- Centralize and streamline permitting process
  - Submit legislation to: January 2016
    - Centralize all permit application processes in the Office of Management of Permits (“OGPe”), providing a single access point and electronic permit interface for all agencies and municipalities
    - Where a federal environmental review procedure is required, integrate concurrent local agency review and make the federal record of decision (“ROD”) binding on local agency ruling to lower costs and avoid inconsistent administrative rulings
    - Provide for a 7-day agency response period for “Categorical Exclusions” (e.g. minor lot designation variations for low impact environmental construction works); applications deemed granted if agency has not ruled on permit during said period
    - Require municipalities to adopt simplified uniform general permitting regulations (“*Reglamento Conjunto*”)
  - Issue Executive Order to expedite planning, permitting and environmental review procedure for high-priority projects, including high-impact infrastructure projects outlined in the FEGP November 2015
  - Consolidate Environmental Quality Board, Solid Waste Authority and Natural and Environmental Resources Department in order to simplify and streamline the environmental review process April 2016
  - Adopt a joint general construction permit and expedited application procedure for “low impact” construction projects April 2016

# Economic Growth and Structural Reform

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## Economic Growth and Structural Measures

## Target Date

### 1.4 Reduce Costs and Improve Ease of Doing Business (cont.)

- |   |               |
|---|---------------|
| <ul style="list-style-type: none"> <li>▪ Modernize property registry               <ul style="list-style-type: none"> <li>- Pass House Bill No. 2479 to implement 100% digital, electronic and paperless property registry platform                   <ul style="list-style-type: none"> <li>❖ Platform expected to be effective upon legislative approval</li> </ul> </li> </ul> </li> </ul> | November 2015 |
| <ul style="list-style-type: none"> <li>▪ Reduce transportation costs               <ul style="list-style-type: none"> <li>- Ask Congress to repeal Jones Act's application to the Commonwealth in order to reduce maritime transport costs to the island</li> </ul> </li> </ul>   | October 2015  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>• Request temporary administrative waiver from US Government in energy related transports</li> </ul> </li> <li>- Review current ground transportation regulatory framework</li> </ul>  | November 2015 |

# Economic Growth and Structural Reform

## Economic Growth and Structural Measures

## Target Date

### 1.5 Invest in Strategic Infrastructure

**The Commonwealth's infrastructure assets (ports, roads, bridges) are in need of substantial capital investments** due to limited financial resources and historically insufficient maintenance. In order to grow the economy, the Commonwealth must **increase spending on capital expenditures** to strengthen its infrastructure system and allow it to continue to serve as a pillar of economic growth. **Given the tight fiscal situation, the Commonwealth should leverage P3s to help achieve its capital expenditure goals**

- Central government to use cash from operations to invest approximately \$3.3 billion<sup>(1)</sup> during the five-year growth and adjustment period to improve infrastructure, boost aggregate demand and implement structural and fiscal measures 2015-2020  
(annual targets)

  - Government to begin budgeting for capital expenditures as part of General Fund budget
  - Capital expenditures (“capex”) program designed to leverage federal matching funds, prioritize projects with economic impact and provide adequate maintenance to public infrastructure, including buildings, roads and bridges
    - Total investment including federal matching funds, amount to ~\$7.7 billion
- In addition to directly funding its capital improvement program, the Commonwealth will seek to leverage P3s to build, maintain and operate new and legacy infrastructure, including electricity generation plants and transportation assets 2015-2020  
(annual targets)
- Strategic infrastructure projects (financed by government, federal and/or private funds) include: 2015-2020  
(annual targets)

  - Roads: Extension of Northwest Highway Corridor, PR-10
  - Airports and Ports: Upgrade Piers 1 and 4, Terminal, Roadway and Taxiways in Aguadilla Airport, Port of the Americas, Dry Dock, Army Terminal, Maintenance Dredging in San Juan Bay
  - Health: Science District (including cost to complete Comprehensive Cancer Center)
  - Strategic: Roosevelt Roads; investments in other strategic sectors (e.g. aerospace)
  - Other: Flood control projects, necessary rehabilitation and maintenance of roads and other public assets

(1) FEGP projections contemplate this investment in maintenance and strategic capex.

# Economic Growth and Structural Reform

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## Economic Growth and Structural Measures

## Target Date

### 1.5 Invest in Strategic Infrastructure (cont.)

- Independent public enterprises, such as PREPA and PRASA, will separately undertake significant capex programs
  - PREPA plans to invest more than \$2 billion over the next five years to upgrade vital generation, transmission and distribution infrastructure, including the Aguirre Offshore Gas Port (“AOGP”)
    - ❖ PREPA restructuring process expected to release sufficient resources to undertake capex program
    - ❖ PREPA submitted a loan application to the US Department of Energy (“DOE”) 1703 Program to finance a portion of AOGP
  - PRASA also contemplates financing approximately \$1.4 billion in capex during the same period for water/waste water infrastructure renewal and replacement, water loss control and technology, among others
- Leverage federal resources through the Build America Transportation Investment Center on transportation related infrastructure projects and P3 proposals

2015-2020  
(annual targets)

# Fiscal Stability – Revenue Enhancing Measures

“Given looming revenue and spending pressures, eliminating the fiscal deficit will take substantial measures. Reforms should aim more at broadening tax bases than raising rates, and at targeted expenditure reduction rather than across-the-board cuts. But even a major fiscal effort leaves large residual financing gaps that will need to be bridged with debt relief.” –the Krueger Report p.19

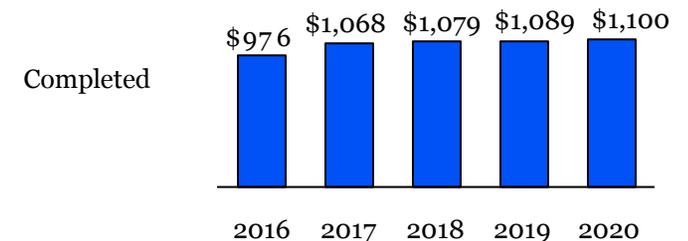
Revenue Enhancing Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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## 2.1 Complete Transition to VAT

In order to decrease tax evasion and increase the revenue capture rate, the Commonwealth must place greater reliance in consumption taxes and move towards VAT. **On May 29, 2015, the Government enacted Act 72-2015, which increases the SUT rate from 7.0% to 11.5%, expands the tax base by taxing certain business to business (“B2B”) services and provides for a VAT to substitute the Central Government’s portion of the SUT**

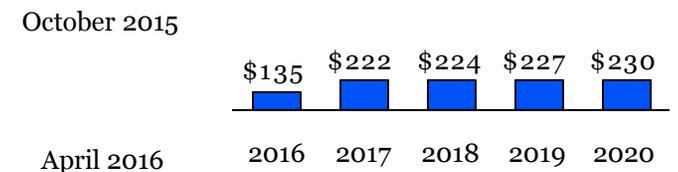
### Increase SUT Rate

- Starting July 2015, transactions that were subject to the 7% SUT are now subject to an 11.5% SUT, with the entire 4.5% increase going to the Central Government<sup>(1)</sup>



### Taxing B2B Services and Transitioning to VAT System (Incremental to SUT Rate)<sup>(1)</sup>

- Starting October 2015, B2B transactions that are currently taxable will be subject to an 11.5% SUT; B2B transactions and professional services that were previously exempt from the SUT will be subject to a 4% SUT
- Starting April 2016, all transactions subject to the SUT will be subject to a new VAT of 10.5% plus a 1% municipal SUT



(1) Numbers shown are the estimated benefit to the General Fund.

# Fiscal Stability – Revenue Enhancing Measures

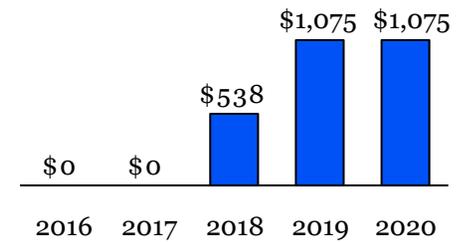
Revenue Enhancing Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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## 2.2 Stabilize Corporate Tax Revenue Base

**The Commonwealth is currently highly dependent on Act 154-2011 excise tax receipts** (approximately 20% of general fund revenues). The 4% excise tax is due to be replaced by a “Modified Source Income Rule” tax in December 2017 (FY 2018) and an extension of the 4% tax rate is necessary to ensure revenue certainty during fiscal and economic adjustment period

- Extend Act 154-2011 4% excise tax for an additional 5-year period as existing multinationals transition to a new corporate tax regime
- Amend, after consultation with existing multinationals, the Internal Revenue Code and Act 73-2008, to establish a new corporate tax regime that substitutes the Act 154-2011 excise tax and its revenues without increasing overall tax liability to existing companies

March 2016



Note: Incremental impact vs. Krueger Report’s “Loss of Act 154” downside risk as modified by Adjusted Estimates

# Fiscal Stability – Revenue Enhancing Measures

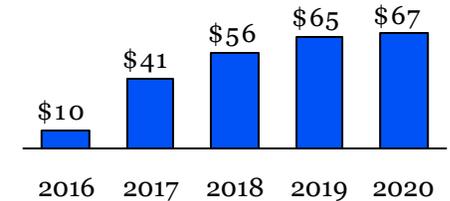
Revenue Enhancing Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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## 2.3 Improve Tax Administration and Enforcement

**The Commonwealth lacks a robust, modern and effective tax administration**, resulting in significant tax evasion and high taxpayer compliance and administrative costs

- Leverage technology and training in order to increase capture rates and improve tax administration and enforcement, including:

2016-2020  
(annual targets)



- Improve Integrated Merchant Portal System (“PICO”)
- Implement Automated System for Customs Data (“ASYCUDA”)
- Expand alternative delivery and payment channels’ capabilities
- Transform Collection Centers into Integrated Service Centers
- Joint-ventures with Municipalities for SUT oversight
- Implement performance management, develop work plans and create Professional Development Institute

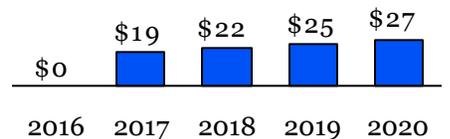
- Restrict use of tax amnesties and closing agreements to increase revenue certainty and reduce tax evasion

June 2016



- Tackle widespread use of illegal video lottery machines that erode Puerto Rico’s tax base by implementing and enforcing tax on, and regulating, video lottery games<sup>(1)</sup>

March 2016



Note: All impact estimates are net of investments.

(1) Net of transfers as required by law.

# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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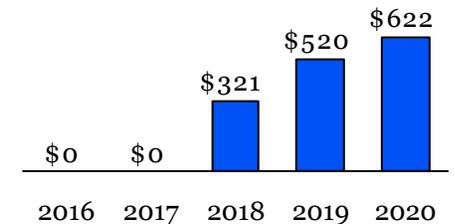
## 2.4 Reduce Operating Costs

Despite significant efforts to **reduce central government expenses** through headcount attrition, freezing formula-based appropriations, service costs and collective bargaining agreements, among other measures, the Commonwealth’s upcoming fiscal challenges, including unfunded retirement systems and increasing health care costs, **will require further expense cuts in governmental subsidies, a gradual reduction in payroll expenses and the implementation of additional operational efficiencies**

### Act 66

- Extend until FY 2021 Act 66-2014’s freeze of new hires, formula-based appropriations, service costs, increase in salaries and collective bargaining agreements<sup>(1)</sup>

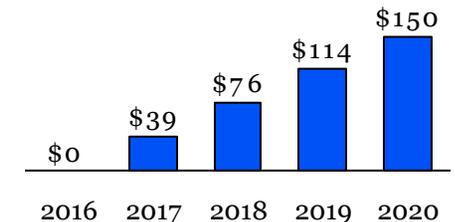
December 2015



### Human Resources

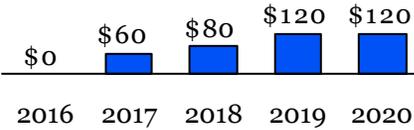
- Reduce payroll costs by implementing a 2% annual attrition target<sup>(1)(2)</sup>
  - To achieve attrition target, the Office of Management and Budget (“OMB”) may offer early retirement window to selected public sector employees
  - Commonwealth may use a portion of the proceeds of P3 initiatives to incentivize voluntary retirement

2016-2020  
(annual targets)



(1) Impact does not include the negative effect on Additional Uniform Contribution to the public pension systems.  
 (2) Totals excludes Puerto Rico Department of Education (“PRDE”). Attrition target with respect to PRDE is included in Section 2.6 hereto.

# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)										
<b>2.4 Reduce Operating Costs (cont.)</b>												
<ul style="list-style-type: none"> <li>Align public sector vacation and sick leave benefits for new hires with the highest benefits for the private sector</li> </ul>	November 2015	Estimated impact to be determined										
<ul style="list-style-type: none"> <li>Implement new government-wide employee classification program to improve mobility, better allocation of human resources and uniform salaries for the same positions across all government so as to continue benefiting from headcount attrition</li> </ul>	June 2016	Estimated impact to be determined										
<u>Operational Efficiencies</u>												
<ul style="list-style-type: none"> <li>Adopt and complete implementation of both: (i) Government reorganization and Efficiency Plan<sup>(1)</sup>, as developed by the OMB and the Department of State, so as to consolidate local government offices, increase use of technology and shared services, and (ii) redesign of governmental structures proposed by OMB and UPR</li> </ul>	2016-2020 (annual targets)	 <table border="1"> <tr> <td>2016</td> <td>2017</td> <td>2018</td> <td>2019</td> <td>2020</td> </tr> <tr> <td>\$3</td> <td>\$18</td> <td>\$26</td> <td>\$41</td> <td>\$42</td> </tr> </table>	2016	2017	2018	2019	2020	\$3	\$18	\$26	\$41	\$42
2016	2017	2018	2019	2020								
\$3	\$18	\$26	\$41	\$42								
<u>Procurement</u>												
<ul style="list-style-type: none"> <li>Achieve ~4% economies of scale and efficiencies by establishing a modern, centralized procurement system in the Puerto Rico General Services Administration (“GSA”) for all purchases greater than \$25,000 (currently \$195,000)</li> </ul>	June 2016	 <table border="1"> <tr> <td>2016</td> <td>2017</td> <td>2018</td> <td>2019</td> <td>2020</td> </tr> <tr> <td>\$0</td> <td>\$60</td> <td>\$80</td> <td>\$120</td> <td>\$120</td> </tr> </table>	2016	2017	2018	2019	2020	\$0	\$60	\$80	\$120	\$120
2016	2017	2018	2019	2020								
\$0	\$60	\$80	\$120	\$120								
<ul style="list-style-type: none"> <li>Federal legislation granting the Commonwealth and its agencies access to the GSA Cooperative Purchasing program and all federal supply schedules</li> </ul>												

(1) Executive Order OE-2015-23.

# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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## 2.4 Reduce Operating Costs (cont.)

### Teacher’s Retirement System

June 2016

- Supreme Court opinion ruled that certain sections of Act 160 can only be applied prospectively to newly hired teachers. Further changes to the TRS are required to ensure the payment of benefits for years to come. Accordingly, TRS is working closely with actuaries towards a reformed proposal that ensures payment of benefits to existing retirees while passing constitutional scrutiny and that considers increases to employee contributions and/or modifications to special law benefits



# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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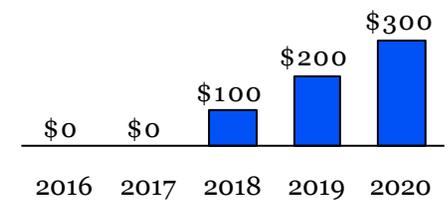
## 2.5 Cut Government Subsidies

The central government's precarious fiscal situation is exacerbated by the **sizable appropriations to independent government entities including municipalities and UPR**. For FY 2015, the government allocated almost 18% of its General Funds in appropriations to independent entities while significantly reducing the budget for the central government

### Municipalities

- Enact legislation to, beginning FY 2018, gradually adjust subsidies provided to municipalities by the central government, while empowering municipalities with the proper legal, administrative and operational tools for them to offset such decrease
  - ❖ Municipalities may present revenue generation and expense reduction initiatives, that may include changes to municipal license fees, modernization of property tax regime and municipal consolidations, among others
  - ❖ Central government to commission a study to provide analysis of, and recommendations with respect to, the relevant alternatives

March 2016



# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)												
<b>2.5 Cut Government Subsidies (cont.)</b>														
<u>University of Puerto Rico</u>														
<ul style="list-style-type: none"> <li>■ The UPR shall develop, in consultation with GDB as fiscal agent, a plan to ensure the continuous delivery of a world-class education in the context of its institutional autonomy, the fiscal environment of the Commonwealth and its historical role as a promoter of the island’s economic development                             <ul style="list-style-type: none"> <li>❖ The UPR has alternatives to operate in a more cost-effective manner, without impacting low-income students, such as means-testing tuition, operational efficiencies, employment attrition and maximizing federal funding</li> </ul> </li> </ul>	January 2016	<table border="1"> <caption>Estimated Incremental Impact FYs (\$ millions)</caption> <thead> <tr> <th>Fiscal Year</th> <th>Impact (\$ millions)</th> </tr> </thead> <tbody> <tr> <td>2016</td> <td>\$0</td> </tr> <tr> <td>2017</td> <td>\$50</td> </tr> <tr> <td>2018</td> <td>\$100</td> </tr> <tr> <td>2019</td> <td>\$150</td> </tr> <tr> <td>2020</td> <td>\$200</td> </tr> </tbody> </table>	Fiscal Year	Impact (\$ millions)	2016	\$0	2017	\$50	2018	\$100	2019	\$150	2020	\$200
Fiscal Year	Impact (\$ millions)													
2016	\$0													
2017	\$50													
2018	\$100													
2019	\$150													
2020	\$200													
<ul style="list-style-type: none"> <li>■ Enact legislation to gradually adjust revenue base underlying general fund formula-based appropriations to the UPR in order to exclude debt service and pension costs                             <ul style="list-style-type: none"> <li>❖ For FY 2016, the Commonwealth budget provides an \$834 million subsidy to the UPR (in addition to ~\$62 million from casino slot revenues plus \$35 million in other direct appropriations), which constitutes over two thirds of the UPR’s total budget</li> <li>❖ Effect of adjustment on UPR’s formula is additive to the effect of the proposed extension of Act 66-2014, which freezes the formula-based appropriation to the UPR</li> </ul> </li> </ul>	June 2016													
<ul style="list-style-type: none"> <li>■ Pass legislation to redirect to Health Insurance Administration (“ASES”) the casino slot revenues currently assigned to the UPR in order to fund current Commonwealth health care coverage to medical poor beneficiaries who do not qualify for Medicaid<sup>(1)</sup></li> </ul>	June 2016													

(1) Casino slot machine revenue has been declining over the last years.

# Fiscal Stability – Expense Reduction Measures

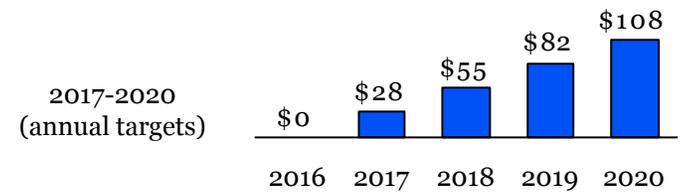
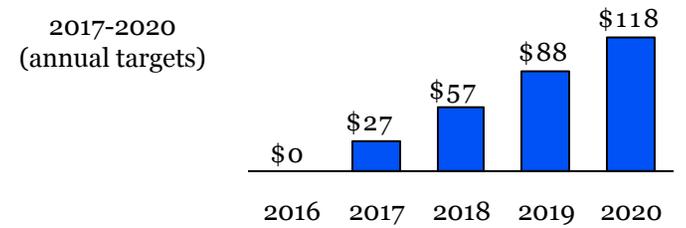
Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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## 2.6 Right-Size Department of Education

Since 1980, enrollment at public schools has declined 41% and, due to demographic trends, it is expected to fall an additional 25% (~317,000 students) by 2020. This decline has led to a reduction in school utilization and a decrease in the student to teacher ratio to 12:1 (US average is 16:1). The Puerto Rico Department of Education has made significant progress during the last two years by consolidating 135 schools and reducing the number of temporary teachers by more than 1,000

- Consolidate public schools based on specific parameters such as enrollment, school utilization and distance to adjust PRDE’s facilities to current demographic trends and improve student-to-teacher ratio for both underutilized and overcrowded schools

  - ❖ The PRDE has made significant progress over the last two years in adjusting its human capital and physical infrastructure to its fiscal and demographic reality. As it continues to right-size its resources, the PRDE will ultimately position itself to deliver high quality education with well compensated teachers
  
- Reduce PRDE’s payroll through 2% attrition<sup>(1)</sup>
  
- Complete remaining phases of PRDE’s ongoing restructuring plan, which requires overhauling the PRDE’s management and operations and reducing expenditures on select private services
  
- Consider selected asset sales, including the Commonwealth’s real estate asset portfolio, to finance retirement windows for teachers and/or capitalize severely underfunded Teachers Retirement System



2016-2020  
Estimated impact should be determined by March 2016

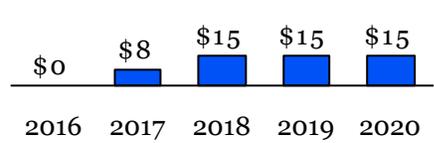
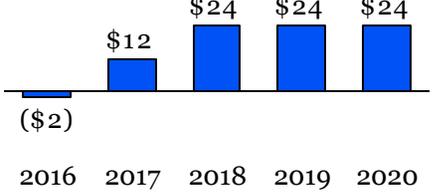
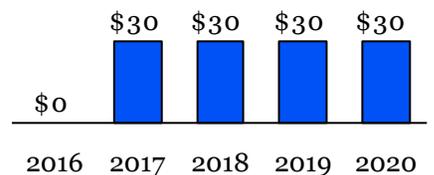
(1) Attrition calculated net of impact attrition measure in Section 2.4 hereto; impact does not include the negative effect of Additional Uniform Contribution to Teachers Retirement System.

# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
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## 2.7 Control Health Care Costs

**The Commonwealth’s public health care plan covers approximately 1.6 million beneficiaries** (all but 180,000 of which are not covered by Medicaid) and is financed by a combination of federal and local funds.<sup>(1)</sup> Puerto Rico ranks #14 nationally in terms of total Medicaid enrollment and #1 as a percentage of population enrolled (48%). While the Commonwealth **is subject to a federal spending cap that limits federal dollars for Medicaid to approximately \$260 million (excluding \$150 million for the Children’s Health Insurance Program “CHIP”), there is no cap for US states. Puerto Rico also faces a “health care cliff,” currently estimated to grow to \$1.7 billion dollars by 2020, upon the exhaustion of Affordable Care Act funding in FY 2018**

<ul style="list-style-type: none"> <li>Implement “STAR”-like<sup>(3)</sup> rating system and establish a provider payment scale based on performance</li> </ul>	October 2015	 <table border="1"> <tr><th>FY</th><th>Impact (\$ millions)</th></tr> <tr><td>2016</td><td>\$0</td></tr> <tr><td>2017</td><td>\$8</td></tr> <tr><td>2018</td><td>\$15</td></tr> <tr><td>2019</td><td>\$15</td></tr> <tr><td>2020</td><td>\$15</td></tr> </table>	FY	Impact (\$ millions)	2016	\$0	2017	\$8	2018	\$15	2019	\$15	2020	\$15
FY	Impact (\$ millions)													
2016	\$0													
2017	\$8													
2018	\$15													
2019	\$15													
2020	\$15													
<ul style="list-style-type: none"> <li>Implement functional P3s at state hospitals (billings, admissions, maintenance and food services among other support services), to bring best in class practices, centralize functions and streamline processes (e.g. surgery cancellations; efficient emergency room management)<sup>(4)</sup></li> </ul>	July 2016	 <table border="1"> <tr><th>FY</th><th>Impact (\$ millions)</th></tr> <tr><td>2016</td><td>(\$2)</td></tr> <tr><td>2017</td><td>\$12</td></tr> <tr><td>2018</td><td>\$24</td></tr> <tr><td>2019</td><td>\$24</td></tr> <tr><td>2020</td><td>\$24</td></tr> </table>	FY	Impact (\$ millions)	2016	(\$2)	2017	\$12	2018	\$24	2019	\$24	2020	\$24
FY	Impact (\$ millions)													
2016	(\$2)													
2017	\$12													
2018	\$24													
2019	\$24													
2020	\$24													
<ul style="list-style-type: none"> <li>Standardize health protocols and establish uniform fee schedules                             <ul style="list-style-type: none"> <li>Create uniform guide for medical procedures and corresponding medical service fee schedule</li> </ul> </li> </ul>	July 2016	 <table border="1"> <tr><th>FY</th><th>Impact (\$ millions)</th></tr> <tr><td>2016</td><td>\$0</td></tr> <tr><td>2017</td><td>\$30</td></tr> <tr><td>2018</td><td>\$30</td></tr> <tr><td>2019</td><td>\$30</td></tr> <tr><td>2020</td><td>\$30</td></tr> </table>	FY	Impact (\$ millions)	2016	\$0	2017	\$30	2018	\$30	2019	\$30	2020	\$30
FY	Impact (\$ millions)													
2016	\$0													
2017	\$30													
2018	\$30													
2019	\$30													
2020	\$30													

(1) Federal funds would include funds from Medicaid, CHIP and Medicare Advantage programs.  
 (2) Coverage will be suspended to those who do not pay the premium; impact is net of incremental operation costs.  
 (3) Centers for Medicare and Medicaid Services (“CMS”) Five Star Quality Rating System.  
 (4) Estimates are based on current P3 billing experience at University District Hospital (“UDH”). Estimates are net of incremental operating costs.

# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)												
<b>2.7 Control Health Care Costs (cont.)</b>														
<ul style="list-style-type: none"> <li>Amend Act 72-1993 to ensure transfer of municipal contributions to ASES (preventing withholding contributions), along with their corresponding federal match<sup>(1)</sup>, and clarify FY 2005 as the base year to calculate municipal contributions</li> </ul>	February 2016	<table border="1"> <tr><th>FY</th><th>Impact (\$ millions)</th></tr> <tr><td>2016</td><td>\$0</td></tr> <tr><td>2017</td><td>\$86</td></tr> <tr><td>2018</td><td>\$86</td></tr> <tr><td>2019</td><td>\$62</td></tr> <tr><td>2020</td><td>\$38</td></tr> </table>	FY	Impact (\$ millions)	2016	\$0	2017	\$86	2018	\$86	2019	\$62	2020	\$38
FY	Impact (\$ millions)													
2016	\$0													
2017	\$86													
2018	\$86													
2019	\$62													
2020	\$38													
<ul style="list-style-type: none"> <li>Rationalize number of federally qualified health care centers receiving grants under Section 330 of the Federal Pubic Health Service Act that are located near existing hospitals or clinics</li> </ul>	July 2016	<table border="1"> <tr><th>FY</th><th>Impact (\$ millions)</th></tr> <tr><td>2016</td><td>\$0</td></tr> <tr><td>2017</td><td>\$5</td></tr> <tr><td>2018</td><td>\$5</td></tr> <tr><td>2019</td><td>\$5</td></tr> <tr><td>2020</td><td>\$5</td></tr> </table>	FY	Impact (\$ millions)	2016	\$0	2017	\$5	2018	\$5	2019	\$5	2020	\$5
FY	Impact (\$ millions)													
2016	\$0													
2017	\$5													
2018	\$5													
2019	\$5													
2020	\$5													
<ul style="list-style-type: none"> <li>Create the Puerto Rico Medical Center Campus organized around specialty institutions by integrating all government hospitals into a single organization<sup>(2)</sup> <ul style="list-style-type: none"> <li>Phase 1 contemplates merging Administration of Medical Services of Puerto Rico (“ASEM”), the University Hospital and University Pediatric Hospital (“HOPU”)</li> <li>Phase 2 would merge the Industrial Hospital (“Hospital Industrial”) currently run by the State Insurance Fund, along with other government run hospitals</li> </ul> </li> </ul>	December 2016	<table border="1"> <tr><th>FY</th><th>Impact (\$ millions)</th></tr> <tr><td>2016</td><td>(\$2)</td></tr> <tr><td>2017</td><td>\$10</td></tr> <tr><td>2018</td><td>\$19</td></tr> <tr><td>2019</td><td>\$19</td></tr> <tr><td>2020</td><td>\$19</td></tr> </table>	FY	Impact (\$ millions)	2016	(\$2)	2017	\$10	2018	\$19	2019	\$19	2020	\$19
FY	Impact (\$ millions)													
2016	(\$2)													
2017	\$10													
2018	\$19													
2019	\$19													
2020	\$19													

(1) Federal matching decreases as ACA funds deplete over time.

(2) Savings are obtained by economies of scale in purchasing, maintenance and other central support functions. Saving are estimated at 5% of each hospital’s budget.

# Fiscal Stability – Expense Reduction Measures

Expense Reduction Measures	Target Date	Estimated Incremental Impact FYs (\$ millions)
<b>2.7 Control Health Care Costs (cont.)</b>		
<ul style="list-style-type: none"> <li>■ Obtain equitable Medicare and Medicaid treatment and funding from US Government</li> </ul>	December 2017	Financial impact subject to timing and nature of federal policy
<u>Medicaid</u>		
<ul style="list-style-type: none"> <li>- Remove statutory limits on Medicaid funding, including not setting the Federal Medical Assistance Percentage (“FMAP”) at a fixed percentage               <ul style="list-style-type: none"> <li>❖ Puerto Rico’s Medicaid funding level is capped at approximately \$260 million and its FMAP rate set at 50%, which per Puerto Rico’s income levels should be 83%</li> </ul> </li> </ul>		
<u>Medicare</u>		
<ul style="list-style-type: none"> <li>- Reimburse Puerto Rico hospitals who admit patients under the Inpatient Prospective Payment System (“IPPS”) at the same rate as mainland hospitals</li> <li>- Make Puerto Rico hospitals eligible for bonus payments under Medicare</li> <li>- Automatically enroll in Medicare Part B individuals enrolled in Medicare Part A</li> <li>- Provide Puerto Rico doctors fair treatment under the Practice Expense Geographic Practice Cost Index (“GPCI”) payment formula</li> <li>- Ensure adequate per member per month (“PMPM”) payments to Medicare Advantage plans in Puerto Rico</li> <li>- Allow adequate utilization of Enhanced Allotment Program (“EAP”) prescription drug funding</li> </ul>		
<u>Medicaid and Medicare</u>		
<ul style="list-style-type: none"> <li>- Extend to Puerto Rico Medicaid and Medicare disproportionate share hospital (“DSH”) program allotments</li> </ul>		

# Fiscal Stability – Expense Reduction Measures

## Expense Reduction Measures

## Target Date

### 2.8 Leverage P3s to Deliver Quality and Cost-Efficient Services

The need for **proper infrastructure construction and maintenance, necessary for economic growth, can be met by leveraging public private partnerships**. Recent positive experience with the LMM Airport and PR-22 Highway demonstrate that P3s are a viable model and an effective tool to rehabilitate and develop necessary infrastructure, reduce operational costs and improve governmental services for the Commonwealth

- Concession remaining toll roads, including PR-20, PR-52 and PR-66 in consultation with US Department of Transportation (estimated impact subject to terms of concession)

  - Improve, intra-Island connectivity, road and bridge quality, and travel safety. Continuous investment in and maintenance of the roads would be mandatory as set forth in a Concession Agreement
  - Concessions would help transform HTA into a contract administrator and limit its construction role
- Merge Public Building Authority and Office for the Improvements of Public Schools (“OMEP”) (estimated impact subject to terms of concession)

  - Transform PBA into a more efficient and effective public corporation; consider transferring the construction function to (“PRIFA”) to avoid duplication of functions
- P3 maritime transport and bus system operations (estimated impact subject to terms of concession)

  - Maritime: 5-year minimum concession agreement for the operation and maintenance of the public maritime transportation services
  - AMA: currently evaluating possible transfer of operations to municipalities and potential P3 transactions
- Evaluate potential concessions for ports and airport operations or facilities, and work with the Federal Aviation Administration (“FAA”) to consolidate underutilized or geographically unnecessary airports (estimated impact subject to terms of concession)
- Identify and pursue additional P3 opportunities

# Institutional Reform and Transparency

*“The legacy of budgetary laxity, non-transparency, and unreliable/dated statistics must be overcome if the reform program is to work and command credibility. The priorities include a rolling 5-year budgetary plan approved by the legislature, legislative rules to limit changes to the plan, an independent fiscal oversight board to advise on the budget and control its implementation, and strengthening the quality and timeliness of economic data.” –The Krueger Report p.22*

## Institutional Reform and Transparency Measures

## Target Date

### 3.1 Install New Accounting and Financial Systems

The central government’s financial and payroll systems are obsolete and can not communicate with the systems of principal agencies, such as the PRDE and the Health Department. Lack of integration of agencies under the same platform hinders the ability to timely monitor expenses, complete annual audits and publish accounting financial statements

- Implement new financial/accounting and payroll system that unifies the patchwork of governmental platforms, which affect the government’s ability to properly monitor its fiscal situation and result in material delays in the preparation of financial information July 2017
  - Contract system provider (implementation schedule is expected to be approximately 18 to 24 months) November 2015
  - Requires an approximate investment of at least \$25 million to \$40 million

### 3.2 Establish Centralized Single Treasury Function

The Commonwealth currently has a highly fragmented treasury system that places weak emphasis on ensuring fiscal and financial controls and provides little visibility of the Government’s consolidated financial position. The centralization of treasury functions in the central government can provide significant communication, visibility and efficiency benefits

- Establish by legislation centralized single treasury functions across Commonwealth agencies and dependent public corporations to enhance visibility, reduce financing costs and improve cash flow June 2016
  - Identify agencies and component units that would be part of the centralized structure January 2016
  - Build the necessary infrastructure for the monitoring and projection of cash flows June 2016
  - Enact legislation to create centralized treasury with provisions that would allow for enforcement June 2016

# Institutional Reform and Transparency

## Institutional Reform and Transparency Measures

## Target Date

### 3.3 Improve Fiscal and Economic Decision-Making

Investors, bondholders, policymakers, and academics have repeatedly pointed to the need of equipping the Commonwealth with more **transparent, reliable and timely macroeconomic data** that complies with global standards. A methodological modernization of the Commonwealth's national accounts is long overdue, along with a **centralized and well-structured approach towards financial and economic development decisions**

- Adopt the Institute of Statistics and the Planning Board 5-year plan to strengthen the economic statistical system and analysis by modernizing national accounts with an estimated investment of \$3 million per year 2015-2020  
(annual targets)

  - Reorganize and expand Puerto Rico's current 5 national accounts into 7 accounts (Net Income and Gross Product, Personal Income and Outlays, Government Receipts and Expenditures, Foreign Transactions-Current, Foreign Transactions-Capital, Gross Savings and Investment and Private Sector Income)
  - Present the national accounting statistics in accordance with the 2008 United Nations standards
  - Develop a new forecasting model for Puerto Rico's national accounts
  - Publish official full-set of quarterly national accounting statistics that is consistent with annual estimates
  - Request technical assistance from the US Bureau of Labor Statistics and the US Bureau of Economic Analysis
- Consolidate the functions of the Treasury Department, OMB and the GDB's non-core banking operations into new Finance and Public Credit Department to better manage and coordinate fiscal and financial policy June 2017

  - Existing fiscal and financial policy is heavily fragmented; international best practices typically consolidate revenue, budget and financial functions to obtain a government-wide visibility and improve execution
- Reorganize the Department of Economic Development and Commerce to better deploy economic promotion resources and shared corporate services

  - Complete DDEC organizational diagnostic with respect to corporate governance, organizational structure, decision-making processes and return on investment philosophy February 2016
  - Submit and pass legislation to implement new DDEC organizational structure and business plan January 2017

# Institutional Reform and Transparency

## **Institutional Reform and Transparency Measures**

## **Target Date**

### **3.3 Improve Fiscal and Economic Decision-Making (cont.)**

- Merge strategic public corporations into a real estate development agency that supplements the Department of Economic Development to improve economic and business planning
  - Centralized entity will serve as a project management coordinator while leveraging resources from current entities and minimizing operational costs via shared services
  - Request to the US Census Bureau that Puerto Rico be included in the Census of Governments and that the National Agricultural Statistical Service provide technical assistance developing agricultural surveys

September 2016

### **3.4 Implement New Budgetary Rules**

Given that the Commonwealth has suffered from chronic **budget deficits** and has repeatedly failed to meet budgetary estimates, it should institute new budgetary rules and practices to impose budgetary discipline and help achieve FEGP targets

- Refer to Summary of Fiscal Responsibility and Economic Revitalization Act of the FEGP

### **3.5 Institute Control Board for Policy Continuity and Compliance**

An independent **fiscal control board, comprised by experienced individuals** from inside and outside the Commonwealth, **shall oversee the implementation of the 5-year FEGP** with the powers necessary to ensure compliance

- Refer to Summary of Fiscal Responsibility and Economic Revitalization Act of the FEGP

# Requests to the US Government

## Federal action is necessary to place Puerto Rico on a sustainable path

Type	Request	Needed for Measure
Long-Term Sustainability	<ul style="list-style-type: none"> <li>▪ Access to a legal framework to restructure the Commonwealth's liabilities in an orderly process</li> </ul>	Financing Gaps
	<ul style="list-style-type: none"> <li>▪ <u>Equitable Medicare and Medicaid treatment and funding</u></li> </ul>	2.7 Control Health Care Costs
	<ul style="list-style-type: none"> <li>- <u>Medicaid</u></li> <li>- Remove statutory limits on Medicaid funding, including not setting the Federal Medical Assistance Percentage ("FMAP") at a fixed percentage               <ul style="list-style-type: none"> <li>❖ Medicaid funding level is capped at ~\$260 million and the FMAP rate set at 50%, which equals an effective rate of 15% to 20%, whereas according to Puerto Rico's income levels should be 83%</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>- <u>Medicare</u></li> <li>- Reimburse Puerto Rico hospitals who admit patients under the Inpatient Prospective Payment System ("IPPS") at the same rate as mainland hospitals</li> <li>- Make Puerto Rico hospitals eligible for bonus payments under Medicare</li> <li>- Automatically enroll in Medicare Part B individuals enrolled in Medicare Part A</li> <li>- Provide Puerto Rico doctors fair treatment under the Practice Expense Geographic Practice Cost Index ("GPCI") payment formula</li> <li>- Ensure adequate PMPM payments to Medicare Advantage plans in Puerto Rico</li> <li>- Allow adequate utilization of Enhanced Allotment Program ("EAP") prescription drug funding</li> </ul>	
	<ul style="list-style-type: none"> <li>- <u>Medicaid and Medicare</u></li> <li>- Extend Medicaid and Medicare disproportionate share hospital ("DSH") program payments</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ Maintain Act 154-2011 excise tax creditability for the duration of the FEGP period</li> </ul>	2.2 Stabilize Corporate Tax Revenue Base
	<ul style="list-style-type: none"> <li>▪ Exemption from Jones Act application to reduce transportation costs and increase competitiveness</li> </ul>	1.4 Reduce Costs and Improve Ease of Doing Business

# Requests to the US Government (cont.)

## Federal action is necessary to place Puerto Rico on a sustainable path

Type	Request	Needed for Measure
<b>Long-Term Growth</b>	<ul style="list-style-type: none"> <li>▪ Provide Puerto Rico with a tax treatment that encourages US investment on the island, such as:               <ul style="list-style-type: none"> <li>- Section 933A: Amend US Internal Revenue Code to add new Section 933A to permit US-owned business in Puerto Rico to elect to be treated as US domestic corporations</li> <li>- Economic Activity Tax Credit: Enact an economic activity tax credit for US investment in Puerto Rico designed as a targeted, cost-efficient version of former Section 936 of the US Internal Revenue Code</li> <li>- Base Erosion: In the event the US moves towards a territorial taxation system, exempt Puerto Rico from base erosion and/or minimum tax measures</li> </ul> </li> </ul>	1.3 Implement Pro-Growth Corporate Tax Regime
	<ul style="list-style-type: none"> <li>▪ Flexibility on minimum wage with respect to young workers</li> <li>▪ “White collar” exemption under Fair Labor Standards Act (“FLSA”)</li> <li>▪ Pro employment requests with respect to NAP and public housing programs</li> </ul>	1.1 Stimulate Employment and Labor Force Participation
<b>Near-Term Impact Measures</b>	<ul style="list-style-type: none"> <li>▪ FAA approval for any airport consolidations</li> <li>▪ Executive approval or Congressional authorization to sell accumulated Federal Highway toll credits</li> </ul>	2.8 Leverage P3s to Deliver Quality and Cost-efficient Services
	<ul style="list-style-type: none"> <li>▪ Technical assistance from the Census Bureau and National Agricultural Statistical Service</li> </ul>	3.3 Improve Fiscal and Economic Decision-Making
	<ul style="list-style-type: none"> <li>▪ DOE financing for Aguirre Offshore Gas Port. Finalize remaining AOGP federal permits</li> <li>▪ Technical Assistance from the Build America Transportation Investment Center on transportation related infrastructure projects and P3 proposals</li> </ul>	1.5 Invest in Strategic Infrastructure
	<ul style="list-style-type: none"> <li>▪ Federal legislation granting the Commonwealth and its agencies access to the GSA Cooperative Purchasing program and all federal supply schedules</li> </ul>	2.4 Reduce Operating Costs

# Summary of Measures – Revenue

A summary of the annual impact of the various revenue measures as determined by the Working Group is presented below

<i>\$ millions</i>	2016P	2017P	2018P	2019P	2020P	Total
<b>Revenue Measures</b>						
<b>2.1 Complete Transition from Original SUT to Increased SUT/VAT</b>	<b>\$1,111</b>	<b>\$1,290</b>	<b>\$1,303</b>	<b>\$1,316</b>	<b>\$1,330</b>	<b>\$6,350</b>
<b>2.2 Stabilize Corporate Tax Revenue Base</b>	–	–	<b>538</b>	<b>1,075</b>	<b>1,075</b>	<b>2,688</b>
<b><u>2.3 Improve Tax Administration &amp; Enforcement</u></b>						
Leverage Tech and Training to Increase Capture Rates and Improve Tax Admin	10	41	56	65	67	239
Restrict Use of Tax Amnesties and Closings	–	25	25	25	25	100
Video Lottery	–	19	22	25	27	93
<b>Improve Tax Administration &amp; Enforcement</b>	<b>10</b>	<b>85</b>	<b>103</b>	<b>115</b>	<b>119</b>	<b>432</b>
<b>Total Revenue Measures</b>	<b>\$1,121</b>	<b>\$1,375</b>	<b>\$1,943</b>	<b>\$2,506</b>	<b>\$2,524</b>	<b>\$9,469</b>
<i>Memo: Total Revenue Measures ex. Increased SUT/VAT Already Enacted</i>	<i>\$10</i>	<i>\$85</i>	<i>\$640</i>	<i>\$1,190</i>	<i>\$1,194</i>	<i>\$3,119</i>

# Summary of Measures – Expense

A summary of the annual impact of the various expense measures as determined by the Working Group is presented below

<i>\$ millions</i>	2016P	2017P	2018P	2019P	2020P	Total
<b>Expense Measures</b>						
<b><u>2.4 Reduce Operating Costs</u></b>						
Extend Law 66	-	-	\$321	\$520	\$622	\$1,463
Employee Attrition	-	39	76	114	150	378
Reclassification of Positions	-	-	-	-	-	-
Reduction in Licenses	-	-	-	-	-	-
Operational Efficiencies	3	18	26	41	42	130
Centralized Procurement	-	60	80	120	120	380
Retirement Plans	-	48	47	46	45	186
<b>Reduce Operating Costs</b>	<b>3</b>	<b>165</b>	<b>550</b>	<b>840</b>	<b>979</b>	<b>2,537</b>
<b><u>2.5 Cut Governmental Subsidies</u></b>						
Municipalities	-	-	100	200	300	600
UPR	-	50	100	150	200	500
<b>Cut Governmental Subsidies</b>	<b>-</b>	<b>50</b>	<b>200</b>	<b>350</b>	<b>500</b>	<b>1,100</b>
<b><u>2.6 Right-Size Department of Education</u></b>						
Consolidate Schools	-	27	57	88	118	290
Reduce Department's Payroll through Attrition	-	28	55	82	108	272
Complete Remaining Phases of PRDE Restructuring Plan	12	23	23	23	23	104
<b>Right-Size Department of Education</b>	<b>12</b>	<b>78</b>	<b>135</b>	<b>193</b>	<b>249</b>	<b>666</b>
<b><u>2.7 Control Health Care Costs</u></b>						
Implement STAR Ratings System and Scale Payments	-	8	15	15	15	53
Implement Functional P3s at State Hospitals	(2)	12	24	24	24	82
Standardize Health Protocols and Impose Uniform Fee Schedules	-	30	30	30	30	120
Restore Municipal Contributions and Corresponding Federal Match	-	86	86	62	38	272
Reduce Number of 330s as IPAs Under Mi Salud	-	5	5	5	5	20
Create the Puerto Rico Medical Center Campus	(2)	10	19	19	19	65
<b>Control Health Care Costs</b>	<b>(4)</b>	<b>151</b>	<b>179</b>	<b>155</b>	<b>131</b>	<b>612</b>
<b>Total Expense Measures</b>	<b>\$11</b>	<b>\$443</b>	<b>\$1,064</b>	<b>\$1,538</b>	<b>\$1,859</b>	<b>\$4,914</b>

## Summary of Measures – Growth, Costs and Total Impact

A summary of the annual impact of the incremental revenue from GNP growth, which is spurred by economic development and structural reforms as determined by the Working Group, is presented below along with a summary of the estimated cost of implementing all of the measures and then the total impact of the growth and measures

- Consistent with the approach taken in the Krueger Report, incremental revenue from economic development and structural reforms is calculated as the difference between a high-growth and a base-case scenario for General Fund revenue sources<sup>(1)</sup>
- The base-case scenario assumes approximately -1% real growth in GNP while the high-growth scenario assumes structural reforms lead to GNP growth of 2% by 2020 (2% inflation is assumed in both cases)
  - In addition, labor reforms are assumed to lead to a greater increase in revenues from personal income taxes, which is calculated using an elasticity factor of 1%, which is also consistent with the Krueger Report
- Incremental costs of the various measures are also shown below and consist of estimates of incremental capex necessary for the measures and growth, incremental pension contributions associated with the measures, cost of earned income tax credits, investment in a new accounting system and the implementation of a new Institute of Statistics plan

<i>\$ millions</i>	2016P	2017P	2018P	2019P	2020P	Total
<b>Total Est. Incremental Rev. from Econ. Dev. and Structural Reforms</b>	–	\$115	\$322	\$584	\$907	\$1,929
<b>Estimated Incremental Cost of Measures</b>	(\$262)	(\$549)	(\$569)	(\$616)	(\$538)	(\$2,533)
<b>Total Impact of Measures</b>						
Revenue Measures	1,121	1,375	1,943	2,506	2,524	9,469
Expense Measures	11	443	1,064	1,538	1,859	4,914
Incremental Cost of Measures	(262)	(549)	(569)	(616)	(538)	(2,533)
<b>Total Impact of Measures</b>	<b>\$870</b>	<b>\$1,269</b>	<b>\$2,439</b>	<b>\$3,428</b>	<b>\$3,845</b>	<b>\$11,850</b>
Est. Incremental Rev. from Economic Development and Structural Reforms	–	115	322	584	907	1,929
<b>Total Impact of Measures and Growth</b>	<b>\$870</b>	<b>\$1,384</b>	<b>\$2,761</b>	<b>\$4,012</b>	<b>\$4,752</b>	<b>\$13,779</b>

(1) General Fund revenue sources include personal income, corporate, SUT/VAT, property, Act 154, alcoholic beverages, cigarettes, motor vehicles, excises on off-shore shipment rum and other taxes. Act 154 taxes are assumed to be held constant in both base- and high-growth scenarios.



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# Summary of Fiscal Responsibility and Economic Revitalization Act

# Fiscal Responsibility and Economic Revitalization Act

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**In order to ensure maximum benefit from the FEGP, the Working Group has drafted the Fiscal Responsibility and Economic Revitalization Act (FRERA) that includes measures that will ensure compliance with the FEGP, including the creation of a control board (and other oversight and compliance measures) as well as new budgetary rules**

## **Selected Highlights of FRERA: The Control Board (or the “Board”) Generally**

- Establishes the Board, which will consist of five individuals appointed by the Governor that must have knowledge and expertise in finance, management, or the operation of business or government and must be independent from other governmental entities
- Provides that Board members will serve for 4-year staggered terms
- Requires that a majority of the nominated Board members be selected from a list provided to the Governor by independent third parties
- Gives the Board oversight authority over most governmental entities, including the Commonwealth, GDB and the public corporations (except PREPA and PRASA)
- Assures the Board’s independence by
  - Giving it its own revenue source for operations
  - Allowing it to hire its own independent staff and professionals
  - Removing a board member only for cause
  - Giving it extensive subpoena powers
  - Authorizing it to levy sanctions for non-compliance with approved budgets

# Fiscal Responsibility and Economic Revitalization Act

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## Selected Highlights of FRERA: Fiscal and Economic Growth Program

- Requires that a Commonwealth-wide consolidated 5-year FEGP be submitted to the Board for approval no later than the end of the 2nd Quarter of FY 2016
- Requires the Board to evaluate whether the proposed FEGP complies with the objectives and requirements provided in the FRERA
- Mandates that the objectives of the FEGP include:
  - Implementing structural reforms that restore economic growth and competitiveness
  - Eliminating, over time, the financing gaps and reducing the debt burden of most governmental entities, including the Commonwealth and public corporations (except PREPA and PRASA)
  - Improving institutional credibility by improving budget formulation and execution and data transparency

# Fiscal Responsibility and Economic Revitalization Act

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## Selected Highlights of FRERA: FEGP (cont.)

- Requires the FEGP to:
  - Include specific proposals to improve and diversify the economy
  - Incorporate structural and economic reforms to ensure long-term fiscal sustainability and economic development
  - Incorporate best practices for making reliable revenue estimates
  - Require that budgets be prepared and calculated pursuant to the modified accrual basis of accounting according to generally accepted standards
  - Require governmental entities to reduce annually, and by FY 2021, eliminate budget deficits
  - Ensure a material reduction in expenditures through more efficient delivery of services
  - Ensure that pension obligations are sustainable and can be honored over the long term
  - Require that the Commonwealth-wide debt load be adjusted to sustainable terms
  - Require that financial controls and accounting systems be improved to monitor fiscal developments on a timely basis
  - Identify automatic budgetary stabilizers to ensure compliance with the proposed FEGP

# Fiscal Responsibility and Economic Revitalization Act

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## Selected Highlights of FRERA: Approval of, and Monitoring Compliance with, the FEGP

- Requires the Board to review and approve the consolidated Fiscal and Economic Growth Plan if it complies with the objectives and requirements set forth in FRERA
- Requires certain entities to submit annual budgets to the Board to ensure that they comply with the approved Fiscal and Economic Growth Plan
- Requires the Board to evaluate whether the budgets comply with the Fiscal and Economic Growth Plan
- Requires the Board to issue non-compliance findings if the budgets do not comply with the Fiscal and Economic Growth Plan
- Requires the Board to monitor compliance with the approved budgets throughout each fiscal year
- Requires the Board to issue non-compliance warnings during the fiscal year or findings at the end of the fiscal year if the entities' actual revenues and expenditures vary from the approved budget in an amount that exceeds a permitted variance determined by the Board
- Imposes severe sanctions for failing to comply with approved budgets, which may include:
  - A prohibition on entering into contracts
  - Automatic hiring freezes
  - Automatic expense cuts (see next slide)

# Fiscal Responsibility and Economic Revitalization Act

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## Selected Highlights of FRERA: New Budgetary Rules for the Commonwealth General Fund

- Provides that the Commonwealth budget be based on a “Revenue Projection” validated by third parties
- Requires that the budget include a 5-year revenue and expense projection
- Prohibits the creation or use of budgetary funds without an identified source of revenues and cancels several existing budgetary funds that do not have identified sources of revenues
- All purchase orders and contracts with third-party suppliers will be subject to OMB budgetary oversight and uniform procedures for approval and recording
- Creates a special fund that may only be used to pay the government’s accounts payable, including tax refunds; amounts to be deposited in such fund shall not be included in the Revenue Projection
- Provides that the Secretary of the Treasury shall adjust each fiscal year’s actual revenue numbers by the difference between the projection of tax refunds made at the beginning of the fiscal year and the revised projections of tax refunds made near the end of the fiscal year
- Provides that a specified amount of each fiscal year’s budget be allocated to a “Budgetary Reserve Fund” until amounts credited to such fund reach a specified percentage of the then-current fiscal year’s Revenue Projection
- Provides that budgetary expenditures for each fiscal year cannot exceed such fiscal year’s Revenue Projection less the amount allocated to the “Budgetary Reserve Fund” amount
- Provides that the Budgetary Reserve Fund may only be used for certain specified purposes
- Mandates that the budget identify a specified amount of operating expenditures that may not be incurred unless OMB (and in some cases the Board) authorizes the use of such funds (known as the “Sequestered Expenditures”)
- Provides that a portion of the Sequestered Expenditures shall be released by the OMB or the Board at the end of each fiscal quarter if actual revenues meet or exceed the Revenue Projection
- Provides that if actual revenues are below the Revenue Projection, the Sequestered Expenditures shall not be released
- Provides that the OMB or the Board may also decide not to release the Sequestered Expenditures to specific entities if it determines that such entities’ actual expenditures will exceed its budgeted expenditures



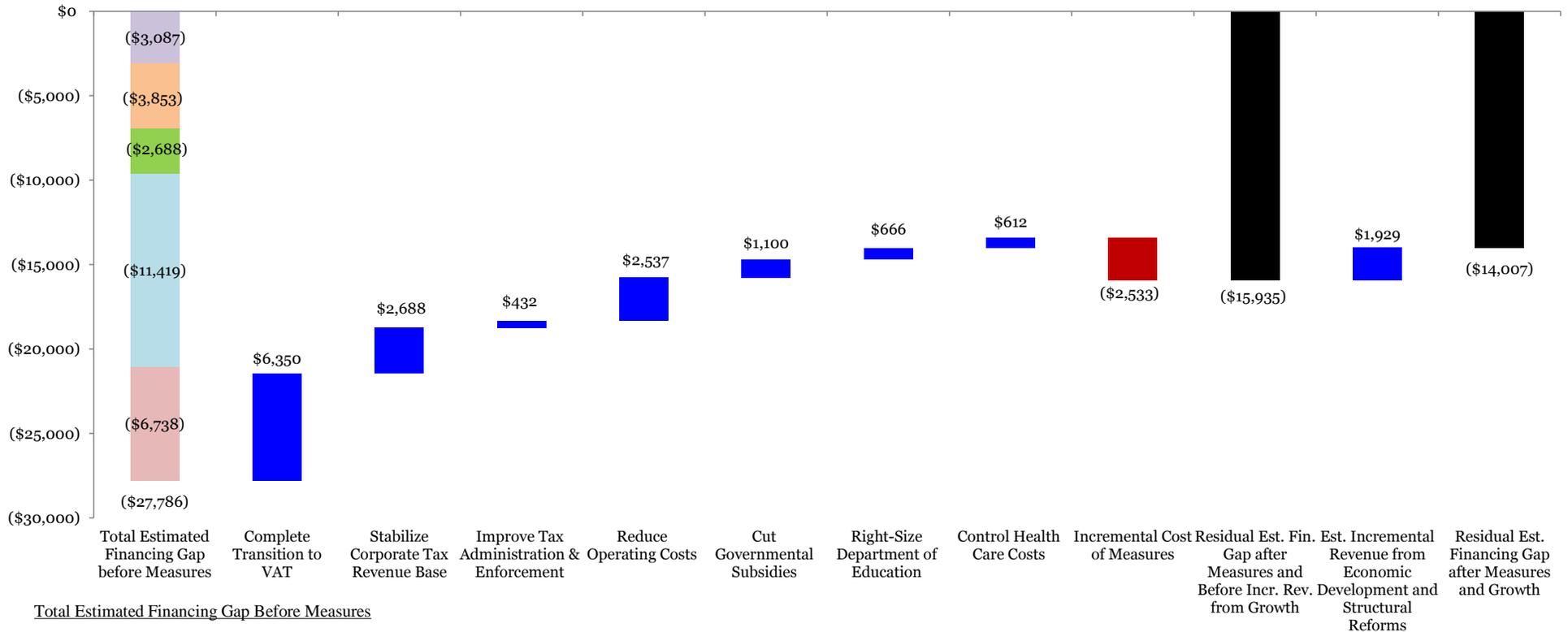
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# Summary of Projected Financing Gap After Measures

# Cumulative Financing Gap Before and After Measures

A summary of the cumulative financing gap before measures from FYs 2016 to 2020<sup>(1)</sup> and the total benefit from each measure over the same period, as determined by the Working Group, is shown below

Cumulative 5-Year Financing Gap (\$ millions)



Total Estimated Financing Gap Before Measures

- Base Financing Deficit before Loss of ACA, Loss of Act 154 and Debt Service and after AUCs and Catch-up Payments to Retirement Systems
- Loss of ACA Funding
- Loss of Act 154 / Foreign Company Tax Losses
- Debt Service - Interest
- Debt Service - Principal

(1) Note that the financing gap before measures has been updated from the Krueger Report, based on new information obtained through diligence by the Working Group. The variances to the Krueger Report are detailed in the appendix.

# Annual Financing Surplus (Gap) Before Debt Service

Based on the Working Group's diligence and the measures previously outlined, the following presents a summary of the estimated annual financing gaps prior to the payment of debt service, but after the implementation of the measures previously outlined

## Projected Financing Surplus/(Gap) before Debt Service (\$ millions)

	2016P	2017P	2018P	2019P	2020P	Total
Total Estimated Financing Gap before Measures (incl. Debt Service)	(\$4,075)	(\$4,386)	(\$4,670)	(\$7,437)	(\$7,217)	(\$27,786)
Consolidated Interest	2,320	2,370	2,320	2,239	2,170	11,419
Consolidated Principal	1,810	1,044	957	1,628	1,299	6,738
Pre-Measures & Pre-debt Service Financing Surplus/(Gap)	55	(972)	(1,392)	(3,571)	(3,749)	(9,628)
<u>Revenue Measures</u>						
Complete Transition to VAT	1,111	1,290	1,303	1,316	1,330	6,350
Stabilize Corporate Tax Revenue Base	–	–	538	1,075	1,075	2,688
Improve Tax Administration & Enforcement	10	85	103	115	119	432
Total Revenue Measures	1,121	1,375	1,943	2,506	2,524	9,469
<u>Expense Measures</u>						
Reduce Operating Costs	3	165	550	840	979	2,537
Cut Governmental Subsidies	–	50	200	350	500	1,100
Right-Size Department of Education	12	78	135	193	249	666
Control Health Care Costs	(4)	151	179	155	131	612
Total Expense Measures	11	443	1,064	1,538	1,859	4,914
Incremental Cost of Measures <sup>(1)</sup>	(262)	(549)	(569)	(616)	(538)	(2,533)
<b>Fin. Surplus before Debt Serv. ex. Economic Growth</b>	<b>\$924</b>	<b>\$298</b>	<b>\$1,046</b>	<b>(\$143)</b>	<b>\$97</b>	<b>\$2,222</b>
Est. Incremental Revenue from Economic Development and Structural Reforms	–	115	322	584	907	1,929
<b>Financing Surplus before Debt Service</b>	<b>\$924</b>	<b>\$413</b>	<b>\$1,369</b>	<b>\$442</b>	<b>\$1,003</b>	<b>\$4,150</b>

(1) Includes estimates of incremental capex necessary for the measures and growth, incremental pension contributions associated with the measures, cost of earned income tax credits, investment in a new accounting system and the implementation of a new Institute of Statistics plan.

# Unsustainability of Existing Debt Service Absent Economic Growth

Even after taking the measures outlined on the previous pages, the FEGP suggests that the Commonwealth cannot service all of its debt as currently scheduled

- Since economic growth is dependent in many ways on elements outside of the Commonwealth's control (such as changes to certain federal government policies), the following exhibit presents the forecasted financing gaps after debt service excluding the estimated impact of GNP growth from economic development and structural reforms
- The financing gap below is shown for illustrative purposes only based on consolidated debt service and with GO bond and GO guaranteed bond debt service<sup>(1)</sup> separately delineated

## Total Projected Financing Surplus/(Gap) Excluding Economic Growth (\$ millions)

	2016P	2017P	2018P	2019P	2020P	Total
<b><u>Financing Gaps Based on Consolidated Interest and Principal</u></b>						
Fin. Surplus before Debt Serv. and Est. Incr. Rev. from Econ Dev. And Struct. Reforms	\$924	\$298	\$1,046	(\$143)	\$97	\$2,222
Consolidated Interest <sup>(2)</sup>	(2,320)	(2,370)	(2,320)	(2,239)	(2,170)	(11,419)
Financing Gap after Consolidated Interest	(1,396)	(2,073)	(1,274)	(2,382)	(2,073)	(9,197)
Consolidated Principal <sup>(2)</sup>	(1,810)	(1,044)	(957)	(1,628)	(1,299)	(6,738)
<b>Total Financing Gap before Economic Growth</b>	<b>(\$3,205)</b>	<b>(\$3,117)</b>	<b>(\$2,231)</b>	<b>(\$4,010)</b>	<b>(\$3,372)</b>	<b>(\$15,935)</b>
<b><u>Financing Gaps with GO and GO Guaranteed Debt Service Delineated</u></b>						
Fin. Surplus before Debt Serv. and Est. Incr. Rev. from Econ Dev. And Struct. Reforms	\$924	\$298	\$1,046	(\$143)	\$97	\$2,222
GO and GO Guaranteed Interest <sup>(1)</sup>	(920)	(953)	(932)	(895)	(860)	(4,561)
GO and GO Guaranteed Principal <sup>(1)</sup>	(925)	(526)	(433)	(483)	(553)	(2,920)
Financing Surplus after GO and GO Guaranteed Debt Service	(921)	(1,182)	(319)	(1,521)	(1,317)	(5,259)
Interest Excluding GO and GO Guaranteed	(1,400)	(1,418)	(1,387)	(1,345)	(1,309)	(6,859)
Financing Gap after GO and GO Guaranteed and All Interest	(2,320)	(2,599)	(1,707)	(2,865)	(2,626)	(12,118)
Principal excluding GO and GO Guaranteed	(885)	(518)	(524)	(1,144)	(746)	(3,818)
<b>Total Financing Gap before Economic Growth</b>	<b>(\$3,205)</b>	<b>(\$3,117)</b>	<b>(\$2,231)</b>	<b>(\$4,010)</b>	<b>(\$3,372)</b>	<b>(\$15,935)</b>

(1) GO and GO guaranteed debt service includes debt service payments related to GO, GDB GO guaranteed bonds, PBA and PRIFA Bond Anticipation Notes ("BANs"). Excludes PRASA and GDB guaranteed intragovernmental loans.

(2) Includes any debt service payments related to debt at GO, GDB, PBA, Public Finance Corporation ("PFC"), COFINA, PRIFA, UPR, Puerto Rico Convention Center District Authority ("PRCCDA"), Puerto Rico Industrial Development Company ("PRIDCO"), GSA, PRIFA BANs, ERS and HTA.

## Unsustainability of Existing Debt Service Even with Economic Growth

Even if the Commonwealth were able to achieve economic growth, the estimated benefit of such growth still would not be enough to allow the Commonwealth to pay all of its contractual debt service as currently scheduled

- The financing gap presented below is shown after the estimated benefit of economic growth; as with the previous page, the financing gap is shown based on consolidated debt service and with GO bond and GO guaranteed bond debt service<sup>(1)</sup> separately delineated

### Total Projected Financing Surplus/(Gap) Including Economic Growth (\$ millions)

	2016P	2017P	2018P	2019P	2020P	Total
<b>Financing Gaps Based on Consolidated Interest and Principal</b>						
Financing Surplus before Debt Service	\$924	\$413	\$1,369	\$442	\$1,003	\$4,150
Consolidated Interest <sup>(2)</sup>	(2,320)	(2,370)	(2,320)	(2,239)	(2,170)	(11,419)
Financing Gap after Consolidated Interest	(1,396)	(1,958)	(951)	(1,798)	(1,166)	(7,269)
Consolidated Principal <sup>(2)</sup>	(1,810)	(1,044)	(957)	(1,628)	(1,299)	(6,738)
<b>Total Financing Gap</b>	<b>(\$3,205)</b>	<b>(\$3,002)</b>	<b>(\$1,909)</b>	<b>(\$3,425)</b>	<b>(\$2,465)</b>	<b>(\$14,007)</b>
<b>Financing Gaps with GO and GO Guaranteed Debt Service Delineated</b>						
Financing Surplus before Debt Service	\$924	\$413	\$1,369	\$442	\$1,003	\$4,150
GO and GO Guaranteed Interest <sup>(1)</sup>	(920)	(953)	(932)	(895)	(860)	(4,561)
GO and GO Guaranteed Principal <sup>(1)</sup>	(925)	(526)	(433)	(483)	(553)	(2,920)
Financing Surplus after GO and GO Guaranteed Debt Service	(921)	(1,067)	3	(936)	(410)	(3,331)
Interest Excluding GO and GO Guaranteed	(1,400)	(1,418)	(1,387)	(1,345)	(1,309)	(6,859)
Financing Gap after GO and GO Guaranteed and All Interest	(2,320)	(2,484)	(1,385)	(2,281)	(1,719)	(10,189)
Principal excluding GO and GO Guaranteed	(885)	(518)	(524)	(1,144)	(746)	(3,818)
<b>Total Financing Gap</b>	<b>(\$3,205)</b>	<b>(\$3,002)</b>	<b>(\$1,909)</b>	<b>(\$3,425)</b>	<b>(\$2,465)</b>	<b>(\$14,007)</b>
<i>Memo: Total Financing Gap ex. Est. Incremental Revenue from Economic Development and Structural Reforms</i>	<i>(\$3,205)</i>	<i>(\$3,117)</i>	<i>(\$2,231)</i>	<i>(\$4,010)</i>	<i>(\$3,372)</i>	<i>(\$15,935)</i>

(1) GO and GO guaranteed debt service includes debt service payments related to GO, GDB GO guaranteed bonds, PBA and PRIFA BANS. Excludes PRASA and GDB guaranteed intragovernmental loans.

(2) Includes any debt service payments related to debt at GO, GDB, PBA, PFC, COFINA, PRIFA, UPR, PRCCDA, PRIDCO, GSA, PRIFA BANS, ERS and HTA.



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# Conclusion

# Conclusion

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- Even after the implementation of the FEGP, which is subject to significant political and execution risks, the Working Group's projections suggest that the Commonwealth cannot meet all of its debt service requirements as currently scheduled and must restructure its liabilities. Further, without significant changes in federal policies, particularly in health care and economic development, the ability of the Commonwealth to meet its debt service costs while providing essential services to its residents will be severely challenged
- While the Working Group recognizes that a restructuring of the Commonwealth's debt would result in hardship to individual bondholders, the Working Group believes that, unless the persistent stagnation of Puerto Rico's economy that has helped fuel the increase in Government debt over the past decade can be reversed, the public debt is not sustainable
- Therefore, in order to make the greatest amount of the debt sustainable in the long term, priority has to be given to:
  - Reigniting Puerto Rico's economic growth in the short- and medium-term;
  - Providing essential services, including health, education and safety, to the people of Puerto Rico, the continued deterioration of which will exacerbate the Commonwealth's negative demographic trends, adversely affect its economic prospects and erode its tax base; and
  - Ensuring government can sustain its pension obligations
- The Fiscal and Economic Growth Plan was designed with these priorities in mind

## Conclusion (cont.)

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- As difficult as debt restructuring is likely to be, the Working Group has instructed its advisors to begin working on a voluntary exchange offer to be made to its creditors as part of the implementation of the Fiscal and Economic Growth Plan
- In the design of the voluntary exchange offer, the Working Group has directed its advisors to take into account the priority accorded to various debt instruments across the Puerto Rico debt complex, including its GO debt, while recognizing that, even assuming the clawback of revenues supporting certain Commonwealth tax-supported debt, available resources may be insufficient to service all principal and interest on debt that has a constitutional priority
- Therefore, a consensual compromise of the creditors' competing claims to the Commonwealth's revenues to support debt service will be required in order to avoid a destabilizing default on the Commonwealth's debt and to avoid a legal morass that will further destabilize the Commonwealth's economy and finances
- Accordingly, the Working Group has directed its advisors to meet with the creditor groups that have already been organized (and those that may be formed hereafter) to explain the Fiscal and Economic Growth Plan and to begin negotiation of the terms of a voluntary exchange offer that can garner widespread creditor acceptance
- **It is the Working Group's belief that a voluntary adjustment of the terms of the Commonwealth's debt that allows the measures contained in the FEGP to be implemented is the best way to maximize all creditor recoveries**



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# Appendix

# Bridge from Budget to Conway

## Risk Adjustments to FY 2016 Budget

- The FY 2016 general fund budget, which is included in the CM TSA adjusted cash flow was adjusted for the potential risks below:
  - Revenue risk shortfall of \$306.4 million is primarily attributable to unfavorable revenue variances for May 2015 and June 2015
  - Litigation settlement of \$5.1 million (not included in the FY 2016 budget related to the Dept. of Health)
  - Debt risk of \$402.0 million is primarily related to debt obligations owed to GDB, for bonds held in the GDB portfolio, and debt service payments related to the Puerto Rico Public Finance Corporation, as follows:
    - ☞ \$308.3 million – contractually obligated debt payments for FY 2016 related to obligations owed to GDB. These debt service payments were not approved by the Legislative Assembly in the FY 2016 budget. Payment of this debt on terms other than the contractual terms could have a negative impact on GDB’s liquidity and its ability to pay obligations as they become due
    - ☞ \$93.7 million – the Legislative Assembly may appropriate for PFC debt service in FY 2016
  - A proposed Economic Development and Obligations Payment Fund totaling \$275.0 million has been created to be used for economic development initiatives and/or the payment of obligations pending legislative approval

### Risk Adjustment to General Fund Budget (\$ millions)

	<u>FY 2016</u>
Revenue	(\$306)
Litigation settlement	(5)
Debt	(402)
Economic Development & Obligations Payment Fund	275
<b>Budget Adjustments</b>	<b>(\$439)</b>

Source: Commonwealth of Puerto Rico Liquidity Update – Conway MacKenzie, Aug. 25, 2015.

# Bridge from Conway to the Krueger Report

## Reconciliation of Conway and Krueger Reports

- The Krueger Report measured a deficit under an approach that is different than Conway's approach in the following areas: the Krueger Report generally used an accrual accounting method as compared to cash; the Krueger Report's methodology included GDB debt owed to third-parties versus Conway's approach that included debt obligations owed to GDB; and finally, the Krueger Report's scope included the broader Commonwealth financial position and Conway's approach only includes inflows and outflows of the TSA account as noted below:

- FY 2016 General Fund budget
- Federal funds
- Net pension benefits
- Non-General Fund revenue/expenses through the TSA
- CM Risk Adjustments to the TSA (debt, working capital, etc.)
- Commonwealth's Liquidity Enhancement Measures
- Select Component Units (ASES, PRITA, UPR, PBA, ASEM)
- CM's analysis does not include cash flow projections for the following:
  - ☞ Component Units, aside from the five noted above
  - ☞ Non-General Fund governmental funds
  - ☞ Special revenue funds
  - ☞ Special debt funds
  - ☞ Capital project funds
  - ☞ Non-major proprietary funds
  - ☞ Other non-governmental and fiduciary funds
  - ☞ Municipalities and the Municipal Property Tax Collection Center ("CRIM")
- Conway's analysis does not include cash flow projections for the following:
  - ☞ Litigation risk
  - ☞ Budget adjustment risk – reduction in spending from FY 2015 to FY 2016
  - ☞ Spending in excess of appropriations
  - ☞ Federal funding risk
  - ☞ Unfavorable economic factors
  - ☞ Extraordinary expenses associated with any restructuring activities

## Conway to Krueger Report Bridge (\$ millions)

	CM Adj. TSA CF	Liq. Outlook	FY 2016
Krueger Deficit (after revenue measures)	(\$2,518)	–	(\$2,518)
Tax and Non-Tax Variance	(73)	150	77
GDB Net Operating Revenue	(130)	–	(130)
Other Fund Inflows	36	–	36
<b>Total Inflows<sup>(1)</sup></b>	<b>(167)</b>	<b>150</b>	<b>(17)</b>
General Fund Budget	143	(183)	(41)
Net Op. Deficit of Non-GF Gov. Funds	362	–	362
Net Op. Deficit of Non-Enterprise Comp. Units	350	(193)	157
Capital Expenditures	300	–	300
Due to Intragovernmental	–	(500)	(500)
FY 2015 Deferred Appropriations (Ex. Debt)	(124)	–	(124)
<b>Non-debt Related Outflows<sup>(1)</sup></b>	<b>1,031</b>	<b>(876)</b>	<b>155</b>
Budgeted Debt + Debt Outflows	230	(150)	80
Other Debt	523	–	523
<b>Total Debt<sup>(2)</sup></b>	<b>754</b>	<b>(150)</b>	<b>603</b>
Working Capital	(438)	400	(38)
<b>Revenue Measures, Net of VAT</b>	<b>63</b>	<b>–</b>	<b>63</b>
<b>Total Variance</b>	<b>\$1,992</b>	<b>(\$1,277)</b>	<b>\$716</b>
<b>CM Liquidity Outlook<sup>(3)</sup></b>	<b>(\$525)</b>	<b>(\$1,277)</b>	<b>(\$1,802)</b>

Source: Krueger Report

Note: Terms defined herein are referenced in more detail within Conway MacKenzie's Liquidity Update of the Commonwealth of Puerto Rico (Aug. 25, 2015).

(1) Variance of inflows and outflows are net of Federal Funds which have a net zero impact. Krueger reports \$6.5 billion where CM's TSA cash flow includes \$3.0 billion.

(2) GDB debt variances totaling \$570 million are related to a different approach in debt disbursements. CM's report includes debt due to GDB, the Krueger Report includes debt owed to third-parties.

(3) The bank to book reconciliation as of June 30, 2015 was approximately \$442.6 million. This risk is not included in the reconciliation above, but is noted in Conway's report.

# Adjustments to the Krueger Report

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**As part of its development of the FEGP, the Working Group reviewed not only the reform measures identified in the Krueger Report, but also the estimates in the Krueger Report for the Commonwealth's financing gaps before the impact of the measures**

- The Working Group's estimate of the total financing gaps facing the Commonwealth generally followed the approach outlined in the Krueger Report
- However, a review of the basis for many of the estimates in the Krueger Report resulted in numerous changes, including:
  - Revised revenue forecasts that incorporated actual results for 2015 that were not available to the Krueger team at the time its report was issued
  - More detailed component unit projections developed by Conway MacKenzie after the release of the Krueger Report
  - Revised capital expenditure estimates on a by-project rather than simply based on historical numbers as was done in the Krueger Report
  - Revised budgetary expense projections from OMB as well as the adjustment of an overestimation of certain expenses (and the resulting impact of Law 66 on these expenses) included in the Krueger Report
- ∞ The revised OMB projections included revised estimates of required additional uniform pension contributions that in turn impacted the estimated shortfalls in the retirement funds that were included in the Krueger Report

# Adjustments to the Krueger Report (cont.)

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- In addition, the decision was made to incorporate HTA into the projections, unlike in the Krueger Report
  - Excluding federal grants, the majority of HTA's revenues come from gas and petroleum taxes collected by the Commonwealth
  - In addition, HTA has been funded with over \$2 billion of loans from GDB
  - Based on these factors, it was determined that HTA should be included in the model to capture a holistic view of Commonwealth-supported entities and resulting deficits on a consolidated basis, as was the goal of the methodology outlined in the Krueger Report
- These changes, the Adjusted Estimates, were reviewed with, and reflect the input of, members of the Krueger team
- The following pages provide a summary bridge from the Krueger Report to the Adjusted Estimates (the consolidated adjusted estimates are also presented earlier in the presentation)

# Bridge from Krueger to Adjusted Estimates

The following exhibit presents a summary of the variances between the Krueger Report and the Adjusted Estimates (prior to the implementation of any measures)

## Bridge from Krueger Report to Adjusted Estimates (\$ millions)

	2016P	2017P	2018P	2019P	2020P	Comments
<b>Krueger Report Fin. Gap Bef. Measures</b>	<b>(\$3,676)</b>	<b>(\$4,169)</b>	<b>(\$5,893)</b>	<b>(\$7,028)</b>	<b>(\$7,147)</b>	
<u>Variations in Adjusted Estimates</u>						
General Fund and Other Select Revenues	(83)	(152)	(194)	(236)	(279)	Revised revenue estimates that incorporate preliminary actual 2015 results that were lower than what had been estimated in the Krueger Report; 2015 revenues form the base for future year estimates. Comparison shown is against the sum of Krueger Report tax and non-tax revenues
GDB Net Operating Revenue (including PRIFA crudita receipts and PRIFA Petroleum Receipts)	(385)	(287)	(82)	(45)	(84)	Revised forecast from GDB. Note that the differential is shown after a deduction of PRIFA BAN debt service (which, in the Adjusted Estimates, is shown in the debt service line, whereas in the Krueger Report it was embedded in the GDB Operating Revenue line). Adjusted Estimates do not include any new loans to the municipalities, only funding on existing lines
COFINA SUT Collection	15	15	16	16	16	Revised forecast based on revised revenue estimates and the development of a waterfall model that projects the SUT allocations; the Krueger Report set COFINA revenues equal to COFINA debt service

# Bridge from Krueger to Adjusted Estimates (cont.)

## Bridge from Krueger Report to Adjusted Estimates (\$ millions)

	<b>2016P</b>	<b>2017P</b>	<b>2018P</b>	<b>2019P</b>	<b>2020P</b>	<b>Comments</b>
HTA Operating Income and Debt Service (ex. Capex)	75	124	172	191	191	HTA is included in the Adjusted Estimates but was excluded from the Krueger Report; numbers here are shown inclusive of all revenues, expenditures (ex. capital expenditures shown in the capital expenditures variance line) and debt service
GF budget (ex. Debt Service and Additional Uniform Contributions)	(102)	(280)	(75)	74	169	Revised budget per OMB as well as adjustment of an overestimation contained in the Krueger Report of certain expenses (and the resulting impact of Law 66 on these expenses). Adjusted Estimates exclude additional uniform contributions for illustrative purposes, whereas the Krueger Report had included the additional uniform contributions in this line (though at a lower amount than included in the most recent OMB projections). In the Adjusted Estimates, ERS debt service was also deducted from the ERS appropriations embedded in the General Fund budget from OMB and then included in the principal and interest lines; the Krueger Report embedded ERS debt service in the retirement shortfall

# Bridge from Krueger to Adjusted Estimates (cont.)

## Bridge from Krueger Report to Adjusted Estimates (\$ millions)

	2016P	2017P	2018P	2019P	2020P	Comments
Additional Uniform Contributions as Compared to Retirement Shortfall	(194)	88	458	(78)	70	Adjusted Estimates run through higher additional uniform contributions, which reduce the "Retirement Shortfall"; the comparison shown here represents the Additional Uniform Contribution in the Adjusted Estimates (including certain catch-up payments) as compared to the Retirement Shortfall shown for each year in the Krueger Report as well as the AUC embedded in the Krueger Report "GF Budget" line. Adjusted Estimates exclude \$58 million annually of estimated AUCs required by municipalities that have historically relied on limited GDB liquidity to fund
Non-General Fund Government Funds	127	129	130	131	132	Represents revised estimates of "non-budgeted funds." Excludes any losses from agencies with independent treasuries, which were included in the Krueger Report, based on further diligence and the inclusion of such outflows in other lines (namely, capex)
Component Units ex. Capex	230	413	256	552	687	Updated for detailed component unit projections that were not available at the time of the Krueger Report
Capital Expenditures	(86)	(285)	(245)	(203)	(38)	Krueger Report based on most recent historical estimates. Adjusted Estimates based on actual schedule of projects not available at the time of the Krueger Report. Adjusted Estimates do not include municipal capital expenditures, which have historically been largely funded by the Commonwealth and GDB

# Bridge from Krueger to Adjusted Estimates (cont.)

## Bridge from Krueger Report to Adjusted Estimates (\$ millions)

	2016P	2017P	2018P	2019P	2020P	Comments
Change in Payables	450	(377)	(51)	(51)	(51)	Krueger Report had made a blanket assumption of a constant reduction in payables; Adjusted Estimates include a more detailed analysis that reduces payables to ~35 days payable outstanding, assumes different repayment periods for different types of payables (i.e., tax refunds are paid on an accelerated schedule as compared to certain other payables), and that the repayment of payables does not begin until FY 2017
Change in Deposits and Deposit Replenishment	(551)	(500)	–	–	–	Based on updated deposit balance information that was not available at the time of the Krueger Report; Amount required for GDB to meet its estimated minimum statutory liquidity requirement of \$350 million and the Commonwealth to have \$1.0 billion of total deposits on hand by FY 2016 and \$1.5 billion by FY 2017
Inflows from Other Entities	105	–	–	–	–	Represents identified inflows from entities outside the model used to cover expenses in the FY 2016 budget
Loss of ACA Funding	–	–	474	(597)	(730)	Updated per revised estimates based on further diligence done on ASES that was not available at the time of the Krueger Report
Act 154 / Foreign Company Tax Losses	–	894	365	(163)	(154)	Updated based on revised diligence conducted with PRIDCO. The impact of the loss of Act 154 is not assumed to begin until halfway through FY 2018
Total Variances in Adjusted Estimates	(\$399)	(\$217)	\$1,224	(\$409)	(\$70)	
<b>Adjusted Estimates before Measures</b>	<b>(\$4,075)</b>	<b>(\$4,386)</b>	<b>(\$4,670)</b>	<b>(\$7,437)</b>	<b>(\$7,217)</b>	

# Total Public Sector Debt

The following summarizes total public sector debt as of June 30, 2015

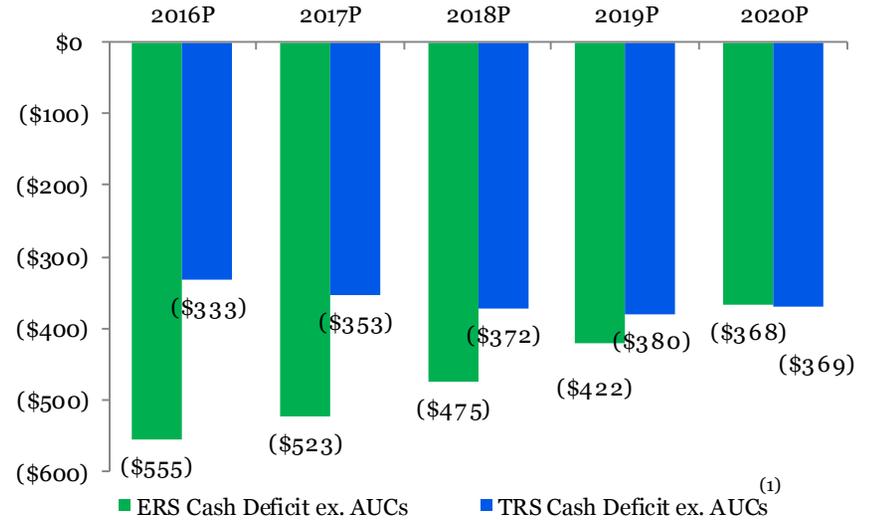
<u>Total Public Sector Debt Outstanding (\$ millions)</u>	
	<u>6/30/15</u>
Full Faith and Credit Bonds and Notes Issued by the Commonwealth	\$13,061
Bonds and Notes Guaranteed by the Commonwealth	<u>5,547</u>
<b>Subtotal</b>	<b>18,608</b>
Debt Supported by Commonwealth Appropriations or Taxes	4,047
Tax and Revenue Anticipation Notes	<u>300</u>
<b>Subtotal - Debt Payable from the General Fund</b>	<b>22,955</b>
Bonds and Notes Payable from Sales and Use Tax Revenue (COFINA)	15,224
Debt Issued by Public Corporations and Other Instrumentalities	23,877
Debt Issued by Municipalities	4,126
Pension Funding Bonds (Payable from Employer Contributions to ERS)	2,948
Other Limited Obligations Debt and Non-recourse Debt	<u>1,987</u>
<b>Subtotal - Other Public Sector Debt</b>	<b>48,162</b>
<b>Total Public Sector Debt</b>	<b><u>\$71,117</u></b>

Note: Not all entities included in the chart above are included in the Adjusted Estimates, consistent with the Krueger Report.

# Retirement Systems Assumptions, Asset Balances and Cash Flows

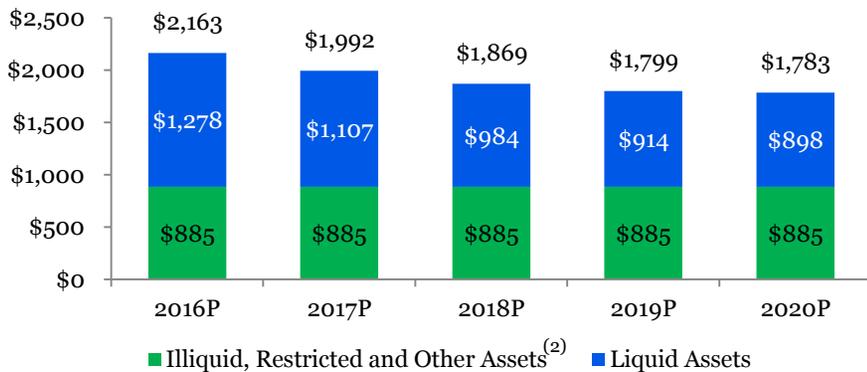
- The following charts summarize the declining asset portfolios of the retirement plans and certain assumptions embedded therein for purposes of developing the FEGP
- Key baseline assumptions include:
  - ERS:** ~2% payroll growth starting in FY 2018, begin to receive AUCs of \$352 mm in FY16, assuming the receipt of past-due contributions from the General Fund, municipalities and public corporations
  - TRS:** ~2% payroll growth starting in FY 2018, begin to receive AUCs of \$30 mm in FY17 & 18 and \$510mm from FY19 forward
  - JRS:** Modeled per June 30, 2014 actuarial valuation cash flows; projected ending balance in FY 2016 of ~\$30 mm expected to be depleted by FY 2018, after which it is assumed that General Fund employs “pay-go” funding of ~\$20 mm per year
- In a scenario that includes accelerated attrition, each retirement plan’s stock of assets would decline faster, necessitating larger AUCs from the central government
- Failure of municipalities or agencies to make contributions would exacerbate asset declines; historically, agencies and municipalities have relied on, among other sources, short-term financing from GDB and others to make such payments and that funding source may not be available going forward

**ERS and TRS Yearly Cash Deficits Ex. AUC (\$ millions)**

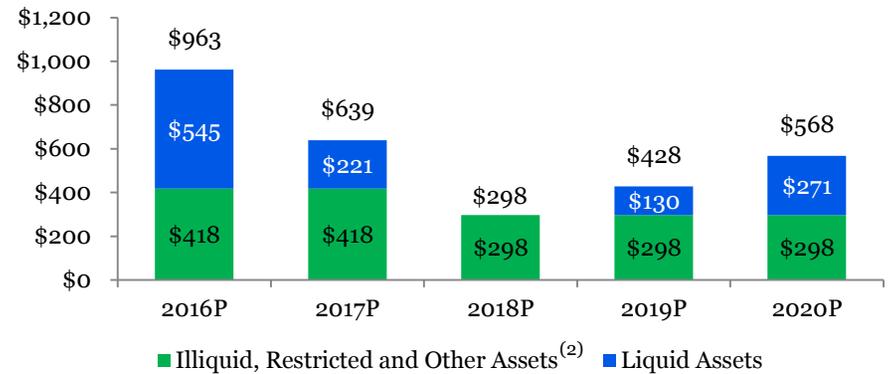


	2016P	2017P	2018P	2019P	2020P
ERS AUCs	\$428	\$352	\$352	\$352	\$352
TRS AUCs	–	\$30	\$30	\$510	\$510

**ERS Ending Asset Balance (\$ millions)**



**TRS Ending Asset Balance (\$ millions)<sup>(1)</sup>**



Note : All data sourced by preliminary data from the actuarial firm’s valuation reports and incorporating certain assumptions from ERS, TRS and GDB. All figures are preliminary in nature and subject to substantial revision pending a complete review of the retirement plans by the actuarial firm based on the latest available actual figures. Many factors affecting the pension are outside their control including actual performance of asset portfolios, plan participant attrition rates, general fund budgeting and policy decisions. These projections may not adhere to GASB accounting. None of the actuarial firm, ERS, TRS or GDB conducted a comprehensive evaluation of these projections and none of the aforementioned parties makes any representation or warranty, express or implied, as to the accuracy or completeness of the assumptions herein.

(1) Projections based valuation as of June 30, 2014, and not updated for FY 2015 performance. Important to note that actual payroll benefit payments were ~\$100 mm higher in FY 2015 and projected to be ~\$120 mm higher in FY 2016 than the baseline projection from the latest actuarial valuation. Potentially, this trend could continue, which could, in turn, lead to a higher AUC estimate for TRS once the June 30, 2015 valuation is performed.  
 (2) Illiquid, Restricted and Other Assets includes restricted cash, unrestricted cash at GDB and COFINA investments, net of accrued liabilities.

# Footnotes for Financing Gaps Before Measures (p. 17)

1. General Fund and Other Select Revenues include General Fund revenues as well as transfers from the Municipal Revenues Collection Center (known as "CRIM") and hotel tax revenues received by PRCCDA, consistent with the Krueger Report. Revenue estimates were revised to reflect greater knowledge of actual collections in 2015 as well as additional diligence done on certain tax revenues, in particular, those associated with the sales and use tax ("SUT") and the foreign entity tax (Act 154).
2. GDB net operating revenue includes net cash flows from its loan portfolio to entities outside of the scope of the Adjusted Estimates as well as PRIFA petroleum tax receipts (which provide an average of \$310 million per year over the projection period). The Krueger Report had netted payments on account of the PRIFA BANs, but in the Adjusted Estimates the debt service associated with the PRIFA BANs is included in the interest and principal lines. Estimates were also revised by GDB. Projections do not include any new loans to the municipalities, only funding on existing lines.
3. COFINA revenues were estimated using a SUT tax waterfall based on current policies and information developed by the Commonwealth. The revenues shown each year correspond to the Pledged Sales Tax Base Amount as defined in the COFINA bond documents. The Krueger Report had set COFINA revenues equal to COFINA debt service.
4. Unadjusted since the Krueger Report.
5. HTA revenues include gas taxes, license fees, toll receipts, investments, petroleum taxes, cigarette taxes, Tren Urbano related receipts for FY2016, and other highway and operating receipts. The HTA projections assume the Tren Urbano is transferred to PRITA in FY 2017.
6. Based on revised estimates of the budget from OMB. Excludes identified additional uniform contributions and debt service. Also adjusts appropriations to PBA and UPR to deduct debt service (which is then included in the principal and interest lines shown separately, similar to the Krueger Report).
7. Additional uniform contributions related to General Fund payments to fund the retirement systems and certain catch-up payments related to unpaid AUC amounts in FY 2014 and FY 2015. Also includes component units which have not budgeted for additional uniform contributions. Excludes \$58 million annually of estimated AUCs required by municipalities which, if not funded, would further deplete assets in the retirement system.
8. Represents revised estimates of "non-budgeted funds." Excludes any losses from agencies with independent treasuries, which were included in the Krueger Report, based on further diligence and the inclusion of such outflows in other lines (namely, capex).
9. Component unit estimates exclude estimated capital expenditures (which are included in the capital expenditure line) and other delineated expenses and risks, such as the loss of ACA funding. Once these items are accounted for, the total impact of the component units on the overall financing gap is negative.
10. Capital expenditures based on GDB forecast of recommended projects not available at the time of the Krueger Report and includes maintenance capex and capex related to regulatory compliance, construction in progress, judgements, emergencies, and extraordinary maintenance and repairs. Does not include municipal capital expenditures, which have historically been largely funded by the Commonwealth via bond issuances and GDB credit facilities.
11. Unadjusted since the Krueger Report.
12. HTA expenditure includes highway and Tren Urbano disbursements, excluding capital expenditures and debt service and including the payment of past-due payables. Tren Urbano related disbursements after FY16 represent pay-down of past due payables, but not ongoing operating costs.
13. Per revised estimates based on further diligence done on ASES.
14. The currently estimated range of the impact of the loss of Act 154 is \$650 million to \$1,500 million. For illustrative purposes, the midpoint of this potential loss is included in the projections (with a half year impact assumed for 2018).
15. Included debt service payments related to GO, GDB, PBA, PFC, COFINA, PRIFA, UPR, PRCCDA, PRIDCO, GSA, PRIFA BANs, ERS, and HTA. PRIFA BANs are on accelerated schedule with excess cash flow sweeps as estimated by GDB. Note that the Krueger Report had netted the PRIFA BANs from the GDB net operating revenues and had embedded ERS debt service in the retirement shortfall estimate.
16. Accounts payable includes amounts owed to General Fund third parties, tax refunds, PRASA, PREPA, and police officer litigation. Excludes pay-downs by component units and HTA, which are embedded in the forecasts for those entities.
17. Amount required for GDB to meet its estimated minimum statutory liquidity requirement of \$350 million and the Commonwealth to have \$1.0 billion of total deposits on hand by the end of FY 2016 and \$1.5 billion by the end of FY 2017.
18. Identified inflows from entities outside the model (primarily SIF) that are used to cover certain General Fund related expenses in FY 2016. These expenses are included in the "General Fund Budget" line.
19. Ratio based on total revenues shown less Federal Transfers. Note that in the build to total revenues GDB net operating revenue includes certain deposit outflows. Additionally, PRIDCO revenues are embedded in the net operating deficit of component units, not in revenues, though its debt service is included in the consolidated interest and principal line items. Also note that any UPR revenues are not included as they are assumed to be offset with other UPR expenses consistent with the Krueger Report approach (appropriations to UPR are included as outflows in the model).

# ECONOMIC PAPERS

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N° 55

June 1987

Regulation or Deregulation of the Labour Market:  
Policy Regimes for the Recruitment and Dismissal of  
Employees in the Industrialised Countries

Michael Emerson

Internal Paper



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Regulation or Deregulation of the Labour Market:  
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Internal Paper

The present paper was prepared while the author was a Fellow at the Center for International Affairs of Harvard University, in 1985-86, on leave from the Commission of the European Communities, Brussels. Opinions expressed in this paper are only attributable to the author, and not to any institution to which he is connected. The author is grateful to Professor R. Freeman of Harvard University and Professor P. Weiler of Harvard Law School for useful information on the United States, to Professor K. Sugeno of Harvard Law School similarly for information on Japan, and to G. Nerb of the Commission of the European Communities who was responsible for arranging the survey of European enterprises whose results are exploited in the text. The author is greatly indebted to Susan Young for her assistance.

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**ABSTRACT**

In recent years there has been increasing interest among economists and policy-makers in the contrast between the comprehensive hiring and firing regulations in Western Europe and Japan and their total absence in the United States. The correlation between these differences and the low and high rates of employment growth of Western Europe and the United States respectively is also often thought to be significant, even if the Japanese case complicates such deductions. The present paper seeks in the first place to fill in for the serious lack of cross-country documentation of these employment regulations. It also sets out results from new surveys of how European employers perceive the impact of these laws. Finally, the paper considers policy options for European countries, the conclusion being that a fairly wide spread of moderate but specific policy reforms appears warranted with a view to helping improve the European employment situation. However, the option of replicating the United States model by total deregulation is rejected.

## **1. Introduction**

The main purpose of this paper is to provide a basis for assessing different policy options that exist in the realm of employment protection regulations and negotiated practices. In particular it is intended to help judge in what respects the policies of West European countries may warrant some reforms with a view to helping achieve a higher level of employment under socially acceptable conditions.

Among labour market regulations that are important for the employment performance of the economy, a large part fall under the colloquial heading of "hiring and firing rules". The main sub-headings here are:

- hiring rules favouring disadvantaged groups
- firing rules:
  - \* individual dismissal
  - \* collective dismissal
  - \* layoff and short-time work
- rules for contracts of limited duration:
  - \* temporary work
  - \* fixed-term contract
  - \* part-time work

There are important interdependencies between these items. Restrictive firing rules create demands for forms of contract that circumvent such rules, for example temporary and fixed-term work contracts. Once a policy orientation of security of job tenure is decided upon, this tends to lead to a more extensive body of regulations so as to limit the use of loop-holes. Employment protection is in this respect similar to trade protection, where the protection of one product leads to the protection of substitutes. This is what makes the difference in employment protection between the United States on the one hand and Europe and Japan on the other hand so categorical. The United States has basically an unregulated hiring and firing system, whereas European and Japanese labour law is comprehensive in these domains. In the absence of any regulation of individual or collective dismissals the United States abstains also from the further regulation of temporary or fixed-term work contracts.

In recent years the subject of these hiring and firing practices has, in economic and political debate, risen from being one of considerable technical obscurity to one of major controversy in relation to employment policy.

The main reason for this seems to lie in the apparent correlation between the differences in the policy regimes in Europe and the United States and these economies' respective employment records. United States employment growth has boomed, whereas Europe's employment has approximately stagnated. United States hiring and firing practices are completely unregulated by public law, whereas those of Europe are heavily regulated. Moreover, Europe's employment protection laws were in many cases accentuated in the early 'seventies, about at the time when the European unemployment problem was beginning to grow. Advocates of deregulation as a policy philosophy have seized upon this important example with enthusiasm. Analysts of the Euroscelerosis syndrome have often dwelt at length on the argument that overregulation of the labour market has made the European economy insufficiently adaptable to changing economic conditions. However, these familiar trans-Atlantic contrasts are too often much oversimplified. This is first of all illustrated by the recent emergence of an important trans-Pacific debate which complicates the trans-Atlantic debate. It is observed that Japan's hiring and firing practices have more in common with those of Europe than those of the United States. Yet Japan has avoided an unemployment problem. It is also argued by business school analysts of the weak competitive position of United States' manufacturing industry that the American tradition of free hiring and firing personnel policies may be part of the problem. By comparison, the Japanese tradition of employment security is associated with heavy investment in personnel training and is rewarded with qualities of loyalty and adaptability on the part of the labour force (see, for example Walton and Lawrence, 1985, Ouchi, 1981 and Thurow, 1985). Secondly, the unregulated regime in the United States is showing increasing evidence of instability in the sense of unpredictable but often very expensive awards by the courts in the case of private litigation over the conditions of dismissal (Flanagan, 1986 and Manes and Rosenbloom, 1985).

Meanwhile, economic theory has also contributed to the debate with attempts to bridge the gulf separating neo-classical, free market advocates and those who observe employment security and economic efficiency often going together. Efficiency wage theory and implicit contract

theory are concerned with reasons why real wage rigidity and employment security may in certain conditions be optimal for both employer and employee (see Akerloff, 1984 and Katz, 1986). Following on from this it has also been argued that where direct or indirect labour costs in the primary labour market are too high to permit a clearing of unemployment from the labour market, the optimal policy may lie in creating less costly employment conditions in a secondary labour market, rather than trying to undermine the wage level and employment security in the primary labour market (see Bulow and Summers). In this latter respect the United States and Japan have more in common, both having important elements of duality in their labour markets. Europe is more clearly the outsider on this account.

The debate over desirable employment protection practices is often conducted in extremely simplified and ideological terms. This is understandable in that the subject matter is complicated for any single country, and formidably so for a representative collection of countries. In addition the subject matter does not easily yield to quantification, unlike wage or social security costs. This weakness in political debate is also extremely unfortunate, because it results in an undue polarisation of positions and confrontation. In fact the subject matter breaks down into large number of eminently negotiable variables. The choice does not have to be between total deregulation on the one hand and the impossibility of dismissals on the other. A very fine graduation of many financial, procedural, and legal dispositions is in fact possible, and observable in the practices of the industrialised countries. It is to be hoped that a better informed debate will lead more easily to a consensus on the most suitable policies.

## **2. Principles Governing the Economic Impact of Hiring and Firing Regulations**

Regulations which raise directly or indirectly the costs of hiring and firing staff may be thought of as having the following six kinds of impact on the behaviour of the enterprise or employee.

- (i) Severance and procedural costs or delays in making dismissals will cause higher employment than otherwise in periods of weak demand, because the enterprise is deterred from reducing its payroll more quickly (see Gavin, 1986).
- (ii) However in normal or good demand conditions, and in the long-run, severance costs and delays will add an element of fixed costs to the wage cost of labour. This fixed cost will have some expected probability of being incurred, depending on the chances of the firm's

finding itself with excess labour at some future time, thus reducing the demand for labour and encouraging capital-for-labour substitution (see Gavin, 1986).

- (iii) Severance costs and procedural constraints will tend to segment the labour market between insiders with protected jobs versus outsiders trying to get jobs. This dampens competitive pressures on the wage level coming from the unemployed and therefore results in less employment than otherwise (see Lindbeck and Snower, 1984).
- (iv) However analyses of labour markets of the implicit contract school would point to employment protection provisions reducing risks for the employee and therefore causing a lower equilibrium wage level, and therefore higher employment (Gavin, 1986).
- (v) The lower probability of dismissal can have an adverse effect on work effort, with reduced possibilities for sanctioning shirking workers. This may also, by contamination, weaken the work effort and cooperation of other workers.
- (vi) However, increased job security is also interpreted in sociological literature as favouring loyalty and dedication of the employee to the interests of the firm (Akerloff, 1984).
- (vii) Employment security will also, through increasing the stability of the labour force, encourage the firm to invest in training and thereby upgrade the productivity of the worker (see Piore, 1986).
- (viii) Employment security may also increase the willingness of workers to accept technological change and internal job mobility and so also upgrade productivity (see Piore, 1986).

Controversy in debate about employment protection regulations is immediately understandable. Argument (i) is directly favourable to employment, argument (ii) is unfavourable. Argument (iii) is unfavourable to employment indirectly through wage effects, whereas argument (iv) is favourable. Argument (v) introduces unfavourable productivity effects but arguments (vi), (vii), and (viii) are favourable to productivity.

All of these arguments are extremely difficult to estimate quantitatively. In some cases, for example those concerning productivity, the importance of the argument will vary greatly between enterprises whose activities rely on team-work, high skills and changing technology; versus enterprises where jobs are simple to learn and to supervise. In the former category of enterprises job security provisions will be relatively more beneficial or less costly than in the second category.

One commendable attempt to formalise and quantify the impact of employment protection provisions is in a paper by Gavin (1986). He has set up a model for testing the employment cost and employment demand effects of severance rules, depending upon the values to be

placed on a number of key variables, including:

- the variability of labour demand (+)
- the trend growth rate of labour demand (-)
- the size of severance payments (+)
- the rate of natural wastage of labour force (retirement and other voluntary quits). (-)

The signs in brackets indicate the direction of impact. Thus a high trend growth of labour demand and high rate of natural wastage lower the probable effective costs of severance provisions. High variability of labour demand and high severance payments raise the probable cost of dismissals. All these variables enter into the equation because what is important in evaluating severance costs is not their simple magnitude (number of months of pay, depending upon length of service), but the expected probability that these costs may be incurred, and the expected probability of other procedural delays in the firm's ability to adjust the labour force to a level corresponding to product demand.

The elasticity of labour demand to wage costs also enters into the equation, notably for estimating employment impacts. Gavin's work has not gone far in relating the actual situation of different economies to the theoretical schema, but this could be done in principle. His sensitivity analysis suggests the possible employment effects to range from the trivial to the substantial.

Two particular points may be underlined at this stage:

- in periods of low demand, wholesale dismantling of employment protection laws might be expected to create more job losses than job creations. However, when demand is low, and expected to remain so in the future, severance costs and delays weigh particularly heavily on the firms' expected labour costs in judging whether to hire new recruits. Therefore, there may be a case, transitionally at least, for measures that retain the acquired rights of existing employees, but impose less heavy constraints on new recruits (ways of doing this are discussed further in the concluding chapter).

- in periods of high demand and buoyant expectations for future growth, employment protection provisions may be perceived by employers to be relatively costless, since voluntary quits would then provide an adequate cushion of flexibility in the size of the payroll. But as the economy moves into a depressed condition the perceived costs of the same laws become, as already suggested, much higher. In this respect the economic consequences of employment protection regulations are similar to unemployment benefits. When the economy is functioning at high activity rates, high levels of employment and social security seem entirely bearable for the economy. However, these features of the system also make the economy vulnerable to a prolonged economic down-turn. Employment protection costs rise in the same way as the social security bill rises. Both further dampen the demand for labour in a vicious circle movement. Such appears to have been the European experience in the period since 1973 (see also Blanchard et al, 1985 and Summers, 1986, and Blanchard and Summers, 1986, on these points.)

### **3. The Broad Picture in Inter-Country Comparisons**

Major differences in regimes for employment protection should show up in the rate of turnover of employment.

One available measure (from OECD, 1985) is the percentage of employees holding their jobs for less than two years. The following rank order has been noted in recent years:

Table 1: Rank order of countries by percentage of employees holding jobs for less than 2 years

1. Italy (1978)	13%
2. Belgium (1978)	18%
3. France (1978)	18%
4. Germany (1978)	19%
Luxembourg (1978)	19%
Japan (1978)	19%
European Community average	19%
7. Ireland (1979)	22%
8. United Kingdom (1979)	24%
9. Denmark (1978)	27%
10. Netherlands (1979)	28%
11. United States (1983)	39%

This measure immediately suggests some convenient rules of thumb. Short job tenure is on average in Europe about the same as in Japan, 19% of employees holding jobs for less than 2

years. In the United States short tenure is twice as frequent, with 39% of jobs held for under two years.

Within Europe, Germany and France find themselves about at the average, with Italy showing markedly fewer short-term jobs. The United Kingdom has more short-term jobs, and is situated together with Denmark and the Netherlands between the European average and the United States.

A second measure (also from OECD, 1985) is the annual turnover rate in the employment of enterprises, as measured by the average of the number of new recruits and separations (retirements, quits and dismissals) per 100 employees. In this case the following rank order emerges for the most recent year available (data is also given for a decade earlier, which indicates the trend):

Table 2: Percentage annual average of new recruits and separations

	<u>Recent data</u>		<u>Earlier data</u>		<u>Change</u>
1. Italy	(1982)	11%	(1971)	28%	-11
2. France	(1982)	14%	(1971)	20%	- 6
3. Sweden	(1984)	18%	(1974)	26%	- 8
4. Japan	(1983)	18%	(1971)	25%	- 7
European Community average		18%		27%	- 9
5. United Kingdom	(1984)	20%	(1971)	30%	-10
6. Germany	(1982)	25%	(1973)	33%	- 8
7. Finland	(1983)	35%	(1972)	38%	- 3
8. United States	(1981)	40%	(1971)	48%	- 8

Although these data concern only manufacturing industries (except for Germany and Finland where they cover the whole economy) a similar story emerges. Job turnover averages 18% per annum in Europe, as in Japan, whereas it is about twice as high in the United States (40%). Within Europe, Italy is again conspicuous for the extremely low degree of labour turnover.

A feature common to all countries, however, is the reduction in the rapidity of labour turnover over the course of the decade covered in the data. For the extent of this reduction, Italy again heads the rank order, followed by the United Kingdom.

Another indicator of the severity or otherwise of policies towards dismissals is found in surveys of unemployed persons which distinguish between various reasons for entering unemployment (dismissal, resignation, new entrants into the labour force, etc.). In the following

data, a low percentage of dismissals suggests relatively severe regulations or practices restraining dismissals, whereas a high percentage suggests a liberal dismissals regime.

Table 3: Percentage of unemployed, 1981, who became so because of dismissal or redundancy

Italy	8%
Greece	37%
France	41%
European Community average	43%
United States	52%
United Kingdom	56%
Netherlands	58%
Denmark	83%

Source: for European countries Eurostat, 1983.

For United States: Bureau of Labor Statistics Monthly Labor Review. The U.S. figure includes 16% on lay-off.

The United States ranks higher than the European Community on average in the extent the unemployed became so because of dismissal, but by a smaller margin than the preceding two indicators of labour market flexibility. (It is possible that the data in Table 3 are not too comparable, the United States unemployed showing a particularly high percentage of re-entrants into the labour market which may be due to the short duration of unemployment benefits. However, cyclical fluctuations in the percentage of dismissals among the unemployed are not very high, ranging in the 'eighties between 50 and 59% in the United States.)

As between European countries, these figures confirm other indicators of the extreme difficulty of making dismissals in Italy; as also the finding of Germany and France in the middle of the European range, with the United Kingdom, the Netherlands and Denmark at the liberal end.

The high dismissals figure for Denmark deserves special note, not only because of its extreme level. Denmark did not participate in the E.C.'s survey of employers, and so is not included in a number of tabulations below. However, the above finding from Eurostat's labour force sample survey is consistent with the view that Denmark's legislation on dismissals is the most liberal in the E.C. It is also the case in the period 1983 to 1985 that Denmark's employment level has grown faster than in any other E.C. country, suggesting a high elasticity of employment to changing economic conditions when the regulation of dismissals is liberal.

As regards Italy's very low dismissals figure, the counterpart is found in the very high percentage (78%) of Italy's unemployed who are first job seekers, compared to 22% for the

European Community on average and 13% for the United States. The high percentage of first job seekers reflects a very acute youth unemployment problem. This illustrates how employment protection law may affect the trade-off of interests between different sections of the Community.

In order to obtain more detailed information on the perceptions of employers as regards the employment impact of these and other regulations, the Commission of the European Communities undertook in 1985 a detailed harmonised survey of 50,000 companies in 9 EC countries (C.E.C., 1986). The results indicated the following rank order of countries according to the importance enterprises attached to "insufficient flexibility in hiring and shedding labour as reason for not employing more staff":

Table 4: Percentage of firms considering insufficient flexibility in hiring and shedding rules to be an important obstacle to employing more staff

1. Italy	83%
2. France	81%
3. Belgium	75%
4. Greece	67%
5. Ireland	68%
European Community average	60%
6. Luxembourg	56%
7. Germany	56%
8. Netherlands	51%
9. United Kingdom	26%

These findings are again broadly consistent with those already reported from labour turnover data. Germany is close to the European average. Italy is the country where the regulatory burden is most widely considered to be an important impediment to employment. The United Kingdom is at the other extreme where only a minority of firms consider hiring and firing regulations to represent an important obstacle to employment. France, Belgium and Greece are also reported by their industrialists to have problematic regulations from the point of view of increasing employment. French regulations were subsequently eased in 1986.

Further use will be made of this survey below on more detailed aspects of hiring and firing regulations, as also of another survey by the International Organisation of Employers (IOE, 1985).

Opinion surveys of this kind are sometimes considered to be of questionable scientific value, especially where they touch on policy issues, as in these cases. The replies may be biased

by the political interests of respondents, so the criticism may go. Some reassurance against this concern, however, is suggested by the fairly good correspondence between the statistics on labour turnover quoted above, and the summary results from the Commission's survey.

#### 4. Rules of Recruitment

It is normally the case that employers are free to decide whom they hire. The regulation of recruitment largely concerns under what conditions, or how they are recruited. However there are some exceptions to the normal freedom over whom to recruit.

The employment of black and Hispanic people and women has been favoured by affirmative action legislation in the United States since 1965, when federal contractors were required by an Executive Order to make "good faith efforts" to employ minorities. Enterprises were required to compare their employment record for these groups with the regional average. Companies with poorer records risked the sanction of being debarred from government contracts. Only 30 such cases are known to have been treated this way, but many more may have been influenced by the threat. 50,000 companies, employing 23 million workers have been affected. Leonard (1985) has conducted research on the difference in employment performance between this group of enterprises and the rest of the economy. His findings were that over the period 1974 to 1980 the growth rate of employment for this group of companies was 3.8% faster for black men, 7.9% faster for black women, 2.8% faster for white women and 12.3% faster for women. For white men, the growth was 1.2% slower. However, in 1986 the Reagan administration decided to amend this legislation, making the target indicators voluntary rather than obligatory. (New York Times, January 11, 1986).

In Europe and Japan there is no comparable legislation, although the relatively unfavourable employment situation of ethnic minorities in several European countries is creating an increasingly similar situation to that of racial minorities in the United States. Anti-discrimination legislation exists in European countries, including the United Kingdom.

Only one European country, Italy, has attempted to regulate precisely whom is to be recruited. The public employment service there implements a law which requires companies seeking to hire workers to follow a rank ordering of candidates determined administratively by the public employment service. This so-called "numerical" system in principle lists candidates by order of merit according to some social criteria, like the size of the person's family

commitments and the length of unemployment spell. The system is widely criticised by employers, and its considerable impracticability has led to its limitation in various ways (jobs requiring special skills are excluded, as are firms with less than 5 employees, the recruitment of up to 10% of workers in large firms, the recruitment of relatives, etc). In 1985, the government decided to allow firms to recruit young people for apprenticeships and otherwise 50% of their needs freely, leaving only the remainder determined by the numerical rank order. These exceptions relax the law, while adding, however, to the complexity of the regulations and administrative practice. The external observer of the Italian labour market may be inclined to regard these remaining constraints in the system as archaic, bureaucratic anomalies, due for scrapping. Since this regulation was introduced, there have been major developments in many other features of the Italian social security system. The case there may have been at some stage for using recruitment regulations of this type an instrument of social policy has surely been greatly weakened.

An issue of concern to more European countries is the performance of public employment offices, and their monopoly status in most countries. The business community is often very critical of the quality of help effectively given by public employment agencies. For example, a recent government survey in Denmark reported that only 10% of vacancies were filled by the public employment service, and that many employers and job seekers had virtually given up using it. Why employment agencies should be a monopoly of the public sector is not evident. In any case the public agencies only enjoy a monopoly in a narrow sense, since a large amount of recruitment is done by other means, for example, direct advertising in the press. In Italy regulations are again more stringent than elsewhere. An employment contract made directly with an individual is subject to annulment by the law if it is not ratified by being put, ex-post, through the mediation of the public agency. Italy, alone with Sweden, prohibits private temporary work agencies (see further below). The demand for temporary labour in Italy has therefore to be channelled through the public agencies, where the procedures mesh with the "numerical" system, described above, of rank-ordered candidates. These provisions have encouraged the expansion of sub-contracting work to small enterprises, including some 1 1/2 million home-workers who can classify themselves as self-employed and escape the various official regulations.

Alone among European countries, the United Kingdom permits licensed private employment agencies to function alongside the public employment services.

In the United States there is no regulation of private employment agencies, or other methods of recruitment. A recent sample survey of manufacturing enterprises showed the following numbers of companies to be using the various means or channels of recruitment indicated:

trade union	16
public employment agencies	77
private employment agencies	78
advertising in media	85
recommendation	84
schools, colleges	171

Employment of handicapped persons. This is the sole category of persons which is generally supported in Europe by affirmative regulations (see Commission of the European Communities, 1985). Germany's employment policies towards handicapped persons may be described as a model case. Enterprises with over 15 employees are required to take on handicapped persons to the extent of a 6% quota. Companies not fulfilling the quota pay a fine of DM 100 per month per head (about 20% of the average wage in manufacturing), and companies more than fulfilling the quota benefit from a subsidy from a fund into which the fines are paid.

The other large European countries also set quotas (France 10%, United Kingdom 3%, Italy 15%). France also has a fine and subsidy system as in Germany. The United Kingdom does not apply financial sanctions, but modulates hiring and firing rules for companies not fulfilling the quota. Italy's quota regime is a simple regulatory requirement.

The smaller European countries have a mix of regimes, some applying quotas some making no quantified requirement.

The Italian policy rules appear to be the most demanding and rigid. The Italian quota of 15% is exceptionally high - a surprisingly high 19% of the population are registered as disabled or handicapped. Less surprisingly, Italy only achieves an actual disabled employment rate of 4.5%, which is about the same as for Germany (4.8% - 1980 figures). The Italian regulation, according to anecdotal information, acts a stimulus to keeping small enterprises just below the maximum size that escapes the regulation. A more flexible regime is to apply fines and

subsidies around the quota as in the German case. In this way the unevenness in local or sectional labour supply and demand conditions for handicapped person can be smoothed out.

The United States has an Executive Order recommending affirmative action in favour of handicapped persons, but there is no compulsion or enforcement, and so the measure may be effectively disregarded.

**Table 5: Employment regulations for handicapped person**

United States	no obligations
France	10% quota for firms with over 10 employees; fines for underfulfillment, subsidies for recruitment
Germany	6% quota for firms with over 15 employees; fines of DM 150 per month for underfulfillment, subsidies for overfulfillment
United Kingdom	3% quota for firms with over 20 employees; limitations on freedom to hire able-bodied persons for underfulfillment and restrictions on dismissal of handicapped persons
Italy	15% quota for firms with over 35 employees
Belgium	no mandatory quotas
Netherlands	3-7% quota may be prescribed by the Social Insurance Council if firms efforts are judged insufficient
Sweden	no mandatory quotas
Denmark	no mandatory quotas
Norway	no mandatory quotas
Ireland	3% quota, mandatory only in public sector
Greece	7% quota for handicapped persons and war veterans for firms with 100 employees or more

Source: Commission of the European Communities (1983), other national sources.

### **5. Systems for Individual Dismissals**

In Europe the rules of individual dismissal often distinguish between cases involving criminal acts and gross misconduct on the one hand, and cases based on economic conditions such as redundancy and the professional suitability or qualifications of the employee. The former category generally allows summary dismissal without compensation. The latter category

generally involves statutory procedures, periods of notice, and minimum amounts of financial compensation. (See I.R.E., 1984, and E.I.R.R., 1985, 1986.)

The procedures for the dismissals based on economic and professional reasons are often set out in extensive detail.

Procedures differ in many details among European countries. One key issue is how far the employer's prerogative to decide on his employment decisions is reduced by the role of third parties - trade unions, works councils, government or the courts. It is frequent for one or other of these third parties to possess considerable discretionary powers. In the Netherlands the government's labour service must approve the decision. In Germany, Italy and Sweden the works council or trade unions must be consulted. In France this was the case until 1986 when the new government repealed this requirement. In Germany if the works council does not agree, the dismissed employee may take the case to the labour court, where procedures are sometimes very long and drawn out (up to 5 years) during which time the employee must be retained on full pay. This is the normal procedure. However there are cases in which the works council's agreement must be obtained, failing which the employer must go to the labour court. In Italy appeal to the courts is likely to see the judiciary take such a favourable view of the employee's social or family problems that dismissal is commonly judged to be practically impossible. In Sweden the trade union has a legal role in determining in the first instance whether a dismissal is unreasonable: the employer can appeal to the courts against an unfavourable position but will rarely win. Other European countries with onerous dismissals procedures are Portugal, Spain, Norway, Belgium and Ireland.

The Japanese system for "regular" employees is equivalent to these European systems in restraining dismissals. Case-law establishes that dismissal for disciplinary reasons should not be overly severe. For example, in a key case, a news broadcaster for the early morning news twice overslept. He was dismissed but through an appeal to the courts he was reinstated (see *Shioda V. Kochi Broadcasting Co.*, 1977 in Sugeno, 1986). Dismissal for economic reasons has to be very strongly justified (see also under collective redundancies).

The United States, by contrast, has no general legislation governing of dismissals. Traditionally, since the 19th century, employers have been free to terminate contracts of employment "at will" for any reason, subject only to limitations established in the individual's

contract of employment or a collective bargaining agreement. Such contracts and agreements may fix periods of notice and amounts of compensation, but this is not required by law. Recently, however, the courts in many states have been moving away somewhat from the ultra-free firing model, requiring that dismissals be justified on reasonable grounds. A few states still adhere to the 19th century presumption, one state court even affirming in 1956 that an employer can freely fire an employee "for good cause, or bad cause, or no cause at all". However, the trend is against this view. Twenty-nine states recognise exceptions to the at-will doctrine. The number of wrongful termination law suits has increased dramatically in recent years - with 10 fold increases each year. Legal experts consider that this trend will continue as lawyers find such cases easy to prosecute and promise potentially staggering awards. Manes and Rosenbloom of Harvard Law School conclude their detailed study (1985) in the following terms:

"Corporations and businesses facing such large damage claims are looking for wages of limiting their risks in the "Russian roulette" of employee law suits. Legislatures are considering proposals that would change the entire termination at-will presumption. The courts are struggling towards a more precise definition of what constitutes a wrongful termination... this area of law is an muddled and confusing as it is significant... The conclusion seems unavoidable that legislation is required to balance the interests of all concerned".

Flanagan (1986) reports an analysis of 102 cases in Californian courts of wrongful discharge between 1982 and 1986. Three-quarters of the plaintiffs' cases were upheld with awards for general damages averaging \$344,000, and awards for punitive damages \$557,000. Thus the costs of "freedom" to dismiss staff in the United States can be very high compared to statutory provisions in Europe. In fact the United States paradigm of free hiring and firing and non-regulation appears in practice to have become unstable, and ultimately unsustainable. While federal legislation appears highly unlikely for the time being, it is not inconceivable that individual states may provide a clearer and more settled framework for the private sector to follow.

The United Kingdom's regime is worth noting as one which is regulated in order to protect against unfair dismissal but nonetheless gives the employer a considerable prerogative to dismiss redundant or poorly adapted staff, with moderate amounts of financial compensation.

However, neither government or trade union approval is required, and the arbitration and tribunal system for dealing with complaints over unfair dismissal is expeditious and fairly sympathetic to the employer's management concerns. Only one-third of complaints reaching the tribunal stage are upheld, and most cases are disposed of within three months of submission to the courts (see Annex 3 for detail). In 1985 the rules were relaxed by raising the minimum period of service required before the tribunal system for unfair dismissal could be used from 1 to 2 years. Ireland has a tribunal system that appears to be comparable with the British system (in 1983 about one-third of cases heard in Ireland were found in favour of the employee charging unfair dismissal).

#### **6. Rules for Collective Redundancies**

As in the case of individual dismissals, the conditions for collective redundancies are regulated in Europe by law. An EC Directive of 1975 stipulates some minimum conditions, such as 30 days of prenotification to be given to workers representatives. EC countries have since adapted their laws as necessary. Similar laws have generally been introduced governing plant closures. (See I.R.E., 1984, and E.I.R.R., 1985, 1986.)

In the United States, by contrast, there is no general law, any legal requirements depending upon the terms of collective bargains (see Harrison, 1984). In 1980 only 15% of collective bargains contained prenotification procedures. In 1981 a Supreme Court decision ruled that a company may close a plant without notification or bargaining with the trade union, unless the collective bargaining contract contains a "preservation of work" clause. In recent years there has been some publicity given to agreements in the automobile and meat-packing sectors in which job-security provisions were granted in exchange for concessions on work practices or pay. However, a survey of such contracts agreed in 1982 suggests that the typical deal saw withdrawal of a planned closure or lay-off against concessions over wage levels rather than commitments to a different system governing job tenure. Moreover, a study by Capelli and McKersie shows that most of these enterprises in fact soon closed down the plants in question.

In Europe the restraints imposed upon management are often analogous to those for individual dismissals. Prenotification delays are added to the specific notice periods owed to individuals as a function of years of service. Trade union consultation is frequently required,

and government authorisation needed in some cases (Netherlands, Greece, Spain, Portugal and, until 1986, France). The effective importance of the intervention of the government is hard to assess. On the one hand the enterprise may see the government's powers of approval or refusal as limiting an important management prerogative. However, the enterprise unable to adjust its labour force to economic necessities will go bankrupt, and the labour ministry will hardly be interested in provoking this. The government's authorisation may, in some cases, amount to little more than registering an event, and putting pressure on the enterprise to show that it considered alternative solutions. In Spain the intervention of the labour ministry amounts more to deliberating on whether dismissals are to be classified as fair or unfair than to preventing dismissals; however, compensation for unfair dismissal is extremely high (see below). In the Netherlands, the government in 1985 decided to limit to four-to-six weeks the maximum time its agencies could take to deliberate on proposed dismissals. In France, too, the government promised in 1985 to shorten delays in which the Administration decides on proposed dismissals (it agreed to 90% of requests in recent years). In 1986 the new government scrapped the need for administrative approval.

In Europe, the cost of compensation to redundant personnel is usually expressed as a function of years of service, but is often a complicated formula. The range for blue collar workers is between 1/2 week's pay per year of service (France), about 1 week (Netherlands, United Kingdom), rising to as much as 4 weeks in Spain. For Germany, Denmark, Norway and Finland the law leaves the amount open to negotiation. Compensation for unfair dismissal is often much higher, 5 months minimum in Italy, 6 months minimum in Belgium, 16-32 months in Sweden and up to 42 months in Spain. The Belgian government in 1985 significantly reduced the scale for compensation awards.

In the United Kingdom the relatively modest cost of redundancies are also 35% subsidised by public funds for enterprises with less than 10 employees. This makes the British regulations the lightest in Europe except perhaps for Denmark and Finland which leave redundancy compensation to be fixed by contract or collective bargain.

In Japan the lifetime employment tradition in large enterprises is buttressed strongly by the requirements of case law decided by the lower courts, although general legislation makes no requirement other than 30 days notice (see Inagami, 1984). Case laws makes it clear that an

extensive set of preconditions have to be met before redundancies can be admitted (see *Toyo Sanso K.K. v. Koji Shimazaki et al*, in Sugeno, 1986). The objective need to make redundancies for economic reasons has been established, and a specific list of alternative courses of action has to be exhausted such as recourse to internal transfer of surplus staff, work-sharing and part-time practices, national wastage through non-replacement of retiring personnel, dismissal of temporary workers and calls for voluntary early retirement. Trade unions have also to be consulted. In practice the possibilities for internal deployment of manpower in large firms and the other techniques are such as to make redundancies a rare event. However, smaller firms make more recourse to these legal possibilities for dismissal. The lump-sum payments made to dismissed staff are very large, but these can be confused with the system of retirement gratuities. On average on retirement a Japanese worker receives about 43 months pay as a gratuity, but 55% of firms have no private pension scheme. A dismissed employee receives a similarly important sum, but this implicitly contains quasi-retirement benefits.

The International Organisation of Employers in 1985 (I.O.E., 1985) reported how each country's employers organisation assessed the severity of the rules restraining the termination of employment contracts.

Table 6: Importance of obstacles to the termination of employment contracts

1. Obstacles are fundamental

France  
Germany  
Italy  
Netherlands  
Portugal  
Spain

2. Obstacles are serious

Austria  
Belgium  
Ireland  
Norway  
Sweden

3. Obstacles are minor

Denmark  
Finland

4. Obstacles are insignificant

United Kingdom

According to the Commission's survey in 1985 (C.E.C., 1986) European Community countries assessed the possible employment impact of shorter periods of notice for redundancies and simpler legal procedures in the following rank order:

**Table 7: Percentage of firms judging that there would be a positive employment impact from shorter periods of notice for redundancies and simpler legal procedures**

1.	Italy	88%
2.	Greece	76%
3.	Belgium	74%
4.	Germany	63%
	European Community average	58%
5.	Luxemburg	54%
6.	France	48%
7.	Netherlands	47%
8.	Ireland	35%
9.	United Kingdom	28%

As regards the question whether a reduction in redundancy payments would have a positive employment impact, the Commission survey (C.E.C., 1986) showed the following rank-order:

**Table 8: Percentage of firms considering that a reduction in redundancy payments would have a positive employment impact**

1.	Italy	78%
2.	Belgium	63%
3.	Greece	62%
4.	Luxemburg	52%
5.	Germany	46%
	European Community average	42%
6.	Ireland	33%
7.	United Kingdom	23%
8.	France	22%
9.	Netherlands	12%

It is notable that the financial cost of redundancy payments was in all countries considered to be a less important problem than the length of notice periods and the difficulty of legal procedures. This is particularly so in the case of France (indeed, as noted earlier, French compensation payments are among the lowest, but procedures have been onerous).

This general classification accords well with the main regime features described above. The countries in the first category of the I.O.E. survey (France, Germany, Italy, Netherlands, Portugal, Spain) all featured in 1985 the intervention of trade unions, works councils or government in the procedures and authorisation of dismissals (collective or individual or both). At the other end of the scale are countries which have no governmental interference in the decision process and where the amounts of compensation are not determined by law (Denmark, Finland) or are low (United Kingdom).

#### **7. Lay-Offs or Short-Time Working**

A lay-off is an arrangement whereby a worker is required to stop working for a temporary period, but without termination of the employment contract. The worker is usually not paid wages by the employer, but receives compensation from public funds. Alternatively employees may be required to work on a short-time basis, for example, two to three days per week. As techniques adjusting labour costs in the light of cyclical demand movements, lay-offs and short-time are in principle more flexible than recruitment and dismissal on and off.

Regimes facilitating total lay-off of personnel are not widespread. The possibility to lay-off workers completely exists only in the United States and Italy among the larger industrialised countries where the practice is widely used. Some smaller European countries also have lay-off arrangements (Belgium, Norway) but short-time working is the more general alternative in Europe (EIRR, 1983). The number of workers laid-off in the United States tended to fluctuate between 1 to 2 million in the period 1960 to 1981, from cyclical peak to trough (BLS, 1983). Laid-off workers benefit from the same compensation as in the case of unemployment.

The only European country to have a somewhat comparable regime is Italy where the CIG (Cassa Integrazione Guadanzi - "complementary integration fund") provides compensation of 80% of prior earnings. The original intention of the CIG was that it allow for cyclical flexibility in the labour costs of industrial employers - thus close to the United States system. However it gradually became a shadow unemployment compensation scheme that offered often indefinite benefits of much higher amount than the official unemployment scheme. For example, in March 1986 it was announced that FIAT was going to reemploy about 6,000 workers who had been laid-off for nearly six years. The CIG has in effect given cost flexibility to employers, but has at the same time frozen a sizeable fraction of the industrial labour force in inactive situations, except that reports of beneficiaries working the black economy are legion. Since the CIG was much expanded in the 1970s labour turnover in industry has dropped by one half (see D'Apice and Del Boza, 1985).

The more common type of regime in Europe is short-time working or "partial unemployment." This is the case in France, Germany, the United Kingdom, Spain and the Benelux countries. Typically the worker is compensated as a percentage of lost earnings at the level of unemployment benefits or somewhat less.

Perceptions of competitive disadvantage suffered by European companies compared with the United States are illustrated by the example of competition between Boeing and Airbus in the aircraft industry. Boeing has in the last decade resorted to some massive lay-offs and recalls in order to respond rapidly to changing demand conditions. Airbus, manufacturing in France, Germany, the United Kingdom and Spain, has much greater difficulty in adjusting to peaks in demand. It has to take a longer-term view of demand prospects in recruiting, and typically is more cautious in taking on extra staff. As a result delivery delays are often twice as long for Airbus, compared to Boeing. (See The Sunday Times, 2 March 1986, "Airbus Flies into Battle.")

Table 9: Lay-off or short-time working regimes

United States	Lay-off regime, compensation as for unemployment.
France	Compensation for reduced working time up to total of 50% of gross hourly earnings, up to 600 hours of reduced time per year.
Germany	Compensation for reduced working time up to 68% of net earnings for up to 24 months; 1/3 of employees must be idle for over 10% of working time.
Italy	Compensation of up to 80% of gross earnings paid by the Cassa Integrazione Guadanzi for up to 40 hours per week, ordinarily for up to a year, but in practice indefinitely in the case of recognized reorganisations. In 1987 government proposes to limit indemnities to 3 years.
United Kingdom	No provisions under public law or social security; only as may be negotiated in collective bargains.
Belgium	Compensation in line with unemployment benefits is paid for up to 4 weeks of lay-off or 3 months of part-time work, on condition that full time working then resumes.
Netherlands	Compensation in line with unemployment benefits is paid for up to 6 weeks for reduced working time.
Sweden	Compensation in line with normal pay for up to 30 days a year, the employer being reimbursed at most for 23 days.
Norway	Compensation in line with unemployment benefits is paid for up to 40 weeks in respect of complete workless days.
Switzerland	Compensation in line with unemployment benefits.
Greece	Compensation of 50% of normal pay for up to 3 months per year.
Spain	Compensation in line with unemployment benefits is paid for up to 18 months in respect of reduced working time.

Source: EIRR, 1983.

## **8. Temporary Work and Fixed-Term Employment Contracts**

Temporary work tends to be of two types:

(i) the supply by specialised temporary work agencies of personnel to another company for short periods, in which the workers are legally employed by the agency;

(ii) direct employment on contract for a short and fixed time duration, such as seasonal jobs in agriculture and tourism.

Trade unions are usually strongly opposed to such practices and often argue that they should be outlawed. They see dangers of competition in the labour market from groups that will have weak market power, of abuse by employers of their market power in relation to unorganised labour, and a way of circumventing employment protection laws. Employers point to the need to assure the supply of labour for seasonal or other irregular demands. Individual countries seem in their policies towards temporary work to typify their broader tendencies on questions of labour market rigidity or flexibility (see Albeda (1985) for a detailed account).

Thus in the United States there is no regulation or licensing requirement at all of temporary work companies or individual employment. The numbers of persons employed in this way increased very fast in the years since 1982 (see Carey and Hazelbaker, 1986). According to Albeda (1985) some 500 private companies compete in supplying temporary workers, amounting 1 1/2 to 3 million people depending upon estimates (2-4% of the work force). Such personnel is covered by general labour law (including the minimum wage) and social security. However, the conditions of employment usually exclude fringe benefits such as holidays, holiday pay, and private pension and health insurance benefits; the latter are of course particularly important in the United States since public health insurance is not generally available. The workers can normally be dismissed without notice, compensation or recourse. The only effective restrictions on temporary work come from collective bargains where for given firms trade unions may negotiate a commitment from the firm that they abstain from this market.

In Japan, the temporary work market provides an important element of duality alongside the lifetime employment system (see Hobara, 1985). About 10% of non-agricultural employees are temporary or day labourers, with twice as many women as men in this category. Temporary employment provides a margin of employment flexibility that enterprises want, and the lifetime employment system obviously cannot provide. The pool of temporary workers tends to be those who have quit other jobs and failed to obtain 'regular' recruitment after graduating from school. Directly employed temporary workers are typically subject to special employment rules, notably allowing for termination. National health and pension coverage is typically provided for, but there may be exemptions from unemployment insurance for daily and seasonal workers. Usually temporary workers are excluded from trade union membership.

European regimes have diverged in the extent of their regulatory restriction of temporary work, although the EC Commission has proposed a directive to assure a degree of harmonisation (this proposed directive remains unpassed).

Table 10: Regulation of private sector temporary work agencies

United States	unregulated
Japan	regulated, restricted to specified activities
France	restricted under licensing system
Germany	restricted under licensing system
Italy	prohibited; law strongly prefers permanent employment contracts
United Kingdom	regulated under licensing system
Belgium	restricted under licensing system
Netherlands	restricted under licensing system
Denmark	restricted under licensing system (only permitted in business and office branches)
Norway	restricted under licensing system (only permitted in business and office branches)
Sweden	prohibited; direct temporary employment severely restricted since 1974.
Switzerland	unregulated
Ireland	regulated under licensing system
Greece	restricted to specific activities

**Note:** Temporary work companies hire personnel to a third company for limited periods of time. Direct temporary employment involves only employer and employee in a contract of fixed duration.

**Source:** Albeda (1978).

Italy and Sweden are at the most restrictive end of the regulatory spectrum in Europe. Both countries prohibit private temporary work agencies, and both severely restrict direct employment on the basis of non-permanent contracts. Sweden, however, had freedom of direct temporary employment until 1974 when restrictive legislation was introduced. Both countries apparently have substantial black or grey markets in temporary employment. In Sweden the 1976 "right-to-veto" legislation gave trade unions the power to object to temporary work contracts where "improper practice was taken to be involved" but not necessarily proved (Kennedy, 1984).

A group of other European countries legislated in the period 1970 to 1976 to regulate and restrict temporary work companies quite strictly: Germany, France, Belgium, Netherlands and Denmark. These countries operate licensing systems for such companies imposing not only obvious requirements such as social security coverage but also a variety of restrictions on the type of work or length of contract permitted. Generally trade unions press for total prohibition of temporary employment, and the legislation that has emerged reflects a compromise between the desire of trade unions to prohibit such agencies and that of employers to have freedom to satisfy special employment needs.

In France, the Socialist government in 1982 tightened the regulations governing temporary work, following a rapid expansion of the number of such workers since 1975. The uses of such labour was restricted to specific situations, such as to fill in for absence of a permanent employee. An "insecurity bonus" of 15% had to be paid to staff at the end of the contract. Trade unions were given statutory rights to institute legal proceedings against abusive use of temporary work. As a result it was estimated that a 30% reduction in the number of employees of this type resulted in 1983. In 1986, however, restrictions on temporary work were eased.

In the United Kingdom direct temporary employment (casual labour) has been progressively reduced under legislation adopted in 1975 and 1976 of the Labour government of the day.

The law on fixed-term contracts in Europe tends to be analogous to that set for temporary workers. Typically, regulations define restrictive conditions under which such contracts may be offered (seasonal needs, to replace a permanent employee's temporary absence, etc), and the maximum duration and possibilities for extension of the contract. The 1970s saw in Europe

widespread legislation making these regulations more comprehensive or restrictive. The France governments legislation of 1982 appears to be the last example of the period of tightening regulations. Since then several countries have opened wider opportunities for fixed-term contracts as a way of easing the burden of severe restraints or dismissals. In Germany legislation in 1985 extended the maximum duration of fixed term contracts from 6 to 18 months, also removing the need for any particular justification of such contracts. Spain adopted similar measures already in 1984. Italy in 1984 opened new possibilities to offer fixed term contracts to young people. France in 1986 reversed the restrictions introduced earlier.

Table 11: Regulation fixed-term contracts

United States	unregulated
Japan	permitted, but automatic renewal converts into permanent contract
France	'82 law tightened criteria to jobs only manifestly of a temporary nature; '86 law liberalises, extends duration to 24 months
Germany	'85 law extends (temporarily until 1990) duration from 6 to 18 months, with no justification required
Italy	permitted only for seasonal or exceptional needs
United Kingdom	unregulated, freedom to make fixed-term contracts at will
Netherlands	permitted, but if extended subsequent dismissal requires official permission
Switzerland	unregulated
Sweden	'82 law allows 6 month probationary period, and some special (seasonal) work, including up to 6 months employment in 2 years for peak-load work periods
Finland	permitted only when motivated by temporary nature of work, or traineeship
Norway	illegal, except for naturally limited jobs
Spain	'84 law allows 6 mth - 3 yr contract for new firms
Greece	permitted, but if repeated contract becomes permanent
Portugal	'75 law allows 6 mth to 3 yr contracts upon evidence of temporary nature of work.

Source: I.R.E. and E.I.R.R. (various issues).

The survey of the International Organisation of Employers (I.O.E., 1985) indicated that temporary work regulations were judged as follows:

**Table 12: Importance of regulatory constraints of temporary work according to employers' organisations**

<b>1. Fundamental Constraints:</b>	<b>Belgium Italy Spain</b>
<b>2. Serious Constraints:</b>	<b>France Germany Netherlands Sweden</b>
<b>3. Minor or Insignificant Constraints:</b>	<b>Austria Denmark Finland Ireland Luxembourg Norway Portugal Switzerland United Kingdom</b>

Source: I.O.E. (1985)

The same survey reported the following opinions as regards regulation of fixed-term contracts:

**Table 13: Importance of regulatory constraints of fixed-term employment contracts according to employers' organisations**

<b>1. Fundamental Constraints:</b>	<b>Belgium Italy Netherlands</b>
<b>2. Serious Constraints:</b>	<b>France Germany Luxembourg Sweden</b>
<b>3. Minor or Insignificant Constraints:</b>	<b>Austria Denmark Finland Ireland Norway Portugal Spain Switzerland United Kingdom</b>

Among European Community countries, the Commission's survey of 1985 (C.E.C., 1986) indicated the following rank ordering according to the percentage of firms that would expect a positive employment impact from measures facilitating temporary contracts (fixed term, interim work, etc):

Table 14: Percentages of firms expecting a positive employment impact from measures facilitating temporary contracts

1.	Germany	74%
2.	Luxembourg	69%
3.	Italy	63%
4.	Belgium	63%
	European Community average	55%
5.	France	53%
6.	Greece	50%
7.	Ireland	47%
8.	Netherlands	32%
9.	United Kingdom	27%

### 9. Part-Time Work

The extent of part-time work in the EC on average and in the United States is not, in the aggregate, very different. Some 13 million people were in 1983 working part-time in the EC, compared to 15 million in the United States in 1985. This amounts to 12 and 13% of the labour force respectively. However, the range is quite wide within Europe: 7% in Italy, 9% in France and Germany, 20% in the United Kingdom and even higher in Scandinavia. Japan's labour force includes 6 1/2% of part-time workers, a share that is rising. As Dreze (1986) has shown, a high share of part-time employment tends to in Europe to be associated with high total labour force participation rates. This reflects the widespread preference of second workers in the family to be employed only part-time. There is on both sides of the Atlantic a preponderance of part-time work among women in the 25 to 50 age bracket.

The main difference in the structure of part-time work between the European average and the United States is seen in greater number of young people (three times as many) who work part-time in the United States compared to Europe. In the United States part-time work among high school and university students is widespread and encouraged, whereas in Europe it is much less so. In the United States a little over one quarter of those in the age bracket 16 to 24 years old who are not in full-time labour force have part-time jobs.

The policy regimes for part-time work tend to be quite different as between Europe and the United States.

In Europe the broad thrust of policy has been to provide equality under the law for part and full-time employment (see EIRR, 1985). This principally means assurance of equal basic pay per hour for comparable jobs, equal rights under employment protection law, and the requirement of social security coverage. Social security contributions will normally be proportional to salary, but in some countries the regime is not so neutral or simple. Some countries impose substantial minimum social security contributions (e.g. Belgium) which may mean very heavy taxes on short lengths of working time. Others allow freedom from contributions for work under a certain level. In the United Kingdom this limit is expressed at L35.5 of weekly earnings, which is about one quarter of the average earnings for a full week's work. The United Kingdom also exonerates jobs of under 8 hours per week from the provisions of employment protection law (or 8 to 16 hours if the employee has less than 5 years of service). The Government is proposing currently to extend these thresholds. It is notable that part-time employment benefitting from these provisions has been the main growth element in aggregate employment in the United Kingdom in recent years.

In the United States there is no legislation governing part-time employment. Such jobs are invariably subject to free hiring and firing conditions. Social security contributions are paid at normal percentage rates. More significant is the fact that part-time jobs will often not benefit from fringe benefits such as private medical insurance and private pension coverage. Since social security provides public medical coverage only for very poor or retired people, this is an important effective difference between the primary and secondary labour market. However many female and young part-time workers are covered for private health insurance by family policies subscribed by the main income earner.

Japan's regime is in an intermediary category. Part-time workers do benefit from general social security coverage (including health insurance) as in Europe but there are income ceilings beneath which second family workers do not need to pay social security contributions. Part-time workers often do not benefit from employment protection rules and custom as in the case of regular and life-time jobs. Their basic wages may be below those wages of regular employees. and they will often not receive bonus payments either (see Hobara, 1985).

Table 15: Structure of part-time employment by age and sex in the EC (9) and United States, thousands

	(years)	EC men	(1983) women	total	(years)	US men	(1985) women	total
young	(14-24)	532	1,223	1,755	(16-24)	2,446	2,995	5,441
prime age	(25-49)	568	7,010	7,578	(25-54)	878	5,569	6,447
older	(50+)	935	2,859	3,784	(55+)	1,162	1,715	2,876
Total		2,035	11,092	13,117		4,486	10,279	14,764

Source: Eurostat, Labour Force Sample Survey, 1983. Bureau of Labour Statistics, Employment and Earnings.

### 10. Summary and Conclusions: Options for Policy Reform in Europe

The first option for consideration is the most radical: total deregulation. This is not a purely theoretical hypothesis. It was for a long time the regime of the United States, although the judiciary is through case decisions now increasingly filling the void left by the absence of federal legislation. Economists and business school writers in the United States who recognise the advantages of employment security for employees and many enterprises often draw the conclusion that the optimal degree of employment security can be introduced through collective bargaining or the simple choice of the enterprise. On the other hand, there are arguments favouring an extension of employment security in industry in the United States beyond what the free market has so far delivered. Moreover, the legal regime for coping with disputes over individual dismissals in the United States appears to be in increasing difficulty, in the absence of general legislation providing a framework for case decisions.

The reason for rejecting a de-regulation option for Europe would not, therefore, be only political. As noted above, employment security provisions generate a number of effects on labour costs, employment and productivity, some favourable and some unfavourable. The net impact seems likely to vary considerably between size of firms and types of activity. Therefore the proposition of blanket deregulation would seem ill-adapted. While, the United States' regime appears on close inspection to be less satisfactory than sometimes suggested, Japan has succeeded in reconciling considerable employment security with little unemployment. Politically, total deregulation in Europe would no doubt create very great conflict and instability in industrial relations. Even in the hypothesis of total deregulation by the state, reasons of

economic efficiency would recommend that a large share of total employment would be governed by security of employment contract. The process of wholesale renegotiation of employment contracts in all enterprises in the economy to make explicit what deregulation had rendered unspecified would be an awesome prospect.

A second approach to reform is to consider amending existing legislation where it appears to be unduly onerous, thus retaining the existing legal framework as the basis. A reasoned evolution of the status quo is proposed. In fact the foregoing survey of the existing law in Europe and Japan shows that there are a very large number of eminently negotiable variables filling the space between, on the one hand, the regime of total deregulation and that, on the other hand, of the most constraining possible set of regulations. A struggle over choosing between total deregulation versus total regulation would be not only conflictual but also unnecessary, given the opportunities for fine graduations in the setting of the policy variables. A selection of these variables may be recalled for illustrative purposes: the length of notice for dismissals, the amount of compensation per year of service, the criteria determining fair versus unfair dismissal, the criteria governing temporary and fixed-term contracts, the role of workers' representatives in procedures leading to redundancies, the extent of exemptions from the standard laws for small enterprises, or for young or elderly workers etc.

Four general principles are proposed for reviewing the optimality of employment protection rules:

- the social and economic qualities of secure employment for a large proportion of employees and enterprises should be reflected in the basic design of the law;
- however, the differences of situation between categories of employees and enterprises should be recognised, so as to avoid excessively rigid constraints either for employees who do not need or want it, or for enterprises who need flexibility in the size of their labour force most;
- it should be possible to sanction the shirking worker by dismissal, subject to legal safeguards against abuse;
- the enterprise should retain the prerogative of judging the requisite size of its labour force and for deciding therefore upon the need for collective redundancies. However, this should be subject to respect of minimum requirements for financial compensation

and procedural delays for consultation with workers' representatives and to assure that alternative courses of action to collective redundancies are fully exploited.

As regards policies on individual dismissals the comparison of national regimes suggests the following points. The sharpest issue is whether the employer has in effect the power to dismiss a person for reasons of his misconduct or poor work performance. In general European law distinguishes between "grave misconduct" and "unsatisfactory work performance". Generally "grave misconduct" covers criminal acts such as theft and bodily violence. In these cases summary dismissal is, to the extent of the author's knowledge, provided for in all European countries. The situation of "unsatisfactory work performance" (laziness, incompetence or lack of appropriate skills) is more varied. European practices range from an apparent even-handedness of the law in some countries (the United Kingdom for example) to the practical impossibility of dismissal in others. The latter kind of regime covers a number of different practices, such as the need to prove incompetence to the courts (Portugal), the policy of the courts to override professional criteria with social criteria (Italy), or the extremely onerous or time-consuming procedures that recourse to the courts entails (Belgium, Germany, Sweden). Excessively protective legal procedures have two economic disadvantages. The small enterprise in particular can be discouraged from taking on staff outside the family where the sanction of dismissal is absent. The working atmosphere and productivity of a team of workers can be adversely affected by the presence in their midst of a worker who does not pull his or her weight.

As regards collective redundancies, the requirements of the EC Directive in this domain seem to be quite justifiable in laying down the basis for a consensus model. Minimum prenotification periods are required, as are consultations with workers' representatives and compensation payments as a function of length of service. More controversial, and going beyond the E.C. Directive, are provisions in which either trade unions or governments retain powers of approval or authorisation. Governments have power of approval in the Netherlands, Spain and Portugal, and powers to defer action in Germany. Management can in these cases claim that a basic prerogative is being denied to them. This is countered in some cases with the argument that the labour ministry intervenes with a light hand, or that the political difficulties for a firm in making redundancies may actually be eased by the approval of the government. The essential point would seem to be whether enterprises, in their recruitment

planning, fear the probability of future constraints on their freedom to adjust their labour force when demand is low. For several European countries surveys suggest that this is the case. In some countries the level of minimum compensation payments is also relatively high and perceived to be so by the enterprises.

As regards lay-off and short-time working arrangements, there seem to be some reasons for preferring the European system of short-time working, rather than the United States system of total lay-offs. While the most effective regime doubtless depends upon the technology of individual industries, short-time working has the advantage of greater equity among workers and less discontinuity of work experience. In Italy the lay-off scheme has come to be abused to the considerable cost of the state budget: very high compensation payments go to many people who for long periods of time find supplementary employment.

Temporary work and fixed-term contract regulations allow for derogations, in Europe and Japan, from the dominant regimes of permanent and secure employment contract. In the United States there are simply no such regulations, because the dominant regime places little or no constraints on individual or collective termination of contract. An important question for European and Japanese policy makers is, therefore, how wide and open these derogations should be. Some countries have made the regulatory restriction on temporary work and fixed-term contracts extraordinarily severe. As noted above, for example, Italy and Sweden prohibit private temporary work agencies, whereas most European countries license such agencies in order to guard against abuse of weak members of the labour force. Other countries limit temporary or fixed-term work contracts very narrowly to certain skills or circumstances. On condition that social security and minimum wage laws are respected for such employees, there would be two advantages in opening up opportunities for employment of this type. First, on the labour supply side, many people who are marginal participants in the labour market (youths, elderly people approaching retirement, second workers in families) are not as interested in long-term security of employment as is a middle-aged principal income earner of a family with dependents. Secondly, on the labour demand side, much of potential employment growth appears to lie in small business and service enterprises which have a stronger economic preference for short-term employees, compared with larger and technologically advanced firms which have a greater need for long-term employees.

Similar considerations apply to the supply and demand for part-time work. The case for assuring that these workers also are covered by social security is strong. However, their need to be covered by the employment protection regime for permanent workers is not so strong, especially if there is here, as is to be suspected, a quite sharp trade off between the volume and security of job creation. For many marginal members of the labour force the buoyancy of job offers is a far more plausible source of effective employment security than the long-term nature of employment contracts for a relatively small number of job opportunities.

As regards rules of recruitment favouring disadvantaged workers, there are in most European countries quotas for handicapped workers, whereas there are no significant policy instruments of this type in the United States. In Europe policy techniques range from simple mandatory quotas, to indicative quotas supported by the taxation of under-performing enterprises and subsidies for those employing more than the quota. The latter policy would seem more efficient, given unevenness in the possibility of different firms to absorb handicapped workers and the distortions seen in attempts to evade mandatory quotas (such as keep a firm below a minimum size). Italy is alone in having some other recruitment regulations in which official employment agencies have a role to saying whom enterprises should select. These administrative processes seem quite archaic and due for scrapping.

The policy strategy for employment protection regulations should not be decided in isolation from the specific objectives of economic policy. In the present European context three wider issues may enter into the picture:

- objectives for the labour force participation rate;
- interdependence in the choice of policy strategies for employment protection on the one hand, and for wage rigidity or flexibility on the other;
- judgements about the acceptability of a certain duality in the labour market in the interests of maximising employment and minimising threats to acquired rights.

As regards the labour participation rate, relaxations in employment regulations that led to increased job creation would also be likely to induce an increased supply of labour, for example among the young, elderly and second income earners in the family. The crucial question therefore is whether the European economy needs a rising labour force participation rate, or whether it should alternatively invest in labour supply reducing measures (early retirement

scheme, etc.) to help achieve a better balance in the labour market. Demographic and social security financing considerations strongly point in favour of increasing the labour force participation rate, without which social security taxes will rise further (thus hurting labour demand), or pensions will have to be cut, or both. Of course, in this case, such policies favouring expanded labour supply should also be accompanied by suitably expansionary macroeconomic policies to assure that demand is adequate.

It is often observed that the United States has flexible hiring and firing rules but not so flexible pay levels, that Japan has considerable rigidity in hiring and firing rules but relative flexible pay levels, whereas Europe is relatively rigid on both accounts. The implied policy choice for a Europe wishing to improve its employment situation is between aiming at either greater flexibility in job tenure or in pay levels, or some compromise mix of the two. There are several reasons favouring the compromise approach. As noted above, a policy of total deregulation of employment protection law would seem to be undesirable on economic efficiency as well as political grounds. On the other hand a policy of total reliance on greater pay flexibility would be very difficult to secure for at least two reasons: first, the strength of institutional rigidities lying behind collective bargaining behaviour and, second, the fact that rigid employment protection laws serve to prevent labour market pressures, notably from the unemployed, from bearing upon wage bargainers. Therefore a complementary approach seems preferable, aiming at moderate and mutually supporting reforms in the direction of both employment protection and pay systems.

As regards the dual labour market question, there are issues here of two kinds. Firstly, there is the possibility, already mentioned, of stimulating a faster growth in the future of short-term and part-time employment if certain changes in employment protection law were implemented. Secondly, there is the issue of whether to acknowledge acquired rights in terms of job security laws of existing job-holders, but to change the rules for new employees. There are several arguments that go in the direction of admitting rather than resisting these types of increased labour market duality.

With a much increased labour supply as well as demand, many of the additions to the labour force would be relatively favourably disposed towards short-term and part-time jobs. This prospect sometimes leads to fears being voiced about creating increased "under classes" in

the labour market. However, for Europe this fear would seem not to be very pertinent in a situation in which immigration from developing countries has been stopped (unlike in the United States), and in which the universality of social security coverage would be maintained (also unlike the United States, where health care is not obtained with low level jobs). Relaxations of constraints on short-term work would, for example, be envisaged especially for young and elderly workers.

Some countries (Germany, Spain) have in recent years reformed their employment protection laws in the direction of allowing firms much more liberal recourse to fixed-term contracts for new recruits. This particular policy move has the quality that the situation of the existing labour force on permanent contracts is not changed, whereas many new recruits may have a different status. The rationale favouring such moves is two-fold. By leaving the existing labour force unaffected, this avoids the risk that a general relaxation of the rules at a time of relatively weak business cycle conditions would cause a flood of dismissals. On the other hand the marginal cost of new employment is reduced since there would be no expected severance costs. While such a development would mean a kind of increased duality, its social acceptability should also be rated relatively favourably since it would help break down the differences of interest between insiders (those currently employed in permanent jobs) and outsiders (those currently unemployed) in the labour market. Indeed, this duality among the employed would seem more preferable than the graver social duality separating the employed from the unemployed.

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Annex 1Regulations Governing Individual Dismissals

<b>United States</b>	No general law. In absence of contract or collective bargain employer or employee could, in principle, terminate at will without notice or compensation. However, the judiciary increasingly erodes this situation, often inflicting heavy damages on employers in disputed cases.
<b>Japan</b>	30 days notice required. For dismissal for economic reasons see collective redundancies. Discharge as disciplinary punishment possible. For ordinary dismissals courts will nullify if company's action unreasonable or not based on common sense of society.
<b>Germany</b>	Legislation of 1969 and 1972 permits summary dismissal for gross misconduct. Otherwise notice of 2-3 months required, Works Council must be consulted, dismissal must not be "socially unwarranted". Works Council must approve dismissal, if not employer must appeal to Labour Court, pending which employment must continue. Compensation for unfair dismissal 1 month pay per year of service.
<b>France</b>	Legislation permits summary dismissal for gross misconduct. For dismissal for economic reasons employee is entitled to public retraining facilities and minimum financial compensation (as for collective redundancies).
<b>Italy</b>	Industry and trade union agreement of 1965 and legislation of 1966 and 1970 require employer to supply proof of justified reasons; employee may demand meeting with trade union and employer, a hearing before arbitration and appeal to the courts. Compensation for unfair dismissal not less than 5 months pay. Dismissal considered practically impossible except for criminal acts.
<b>United Kingdom</b>	Legislation of 1975 and 1978 protects against unfair dismissal. Employee can appeal to arbitration and tribunal, employer has to show substantive reasons. Notice of 1 week per year of service, compensation 1/2 to 1 1/2 weeks pay per year of service.
<b>Belgium</b>	Legislation of 1966 and 1978 permits summary dismissal for gross misconduct. Otherwise notice of 7 to 56 days for blue-collar workers or 3-15 months for white-collar workers is required (often longer by collective agreement). Appeals to tribunal may lead to compensation for unfair dismissal of at least 6 months pay.
<b>Netherlands</b>	Legislation permits summary dismissal for gross misconduct. Otherwise approval of Labour Office must be obtained, with notice of 1-6 months week per year of service.
<b>Denmark</b>	Notice periods and severance pay is largely left to (legally enforceable) collective agreements.
<b>Sweden</b>	Legislation of 1982 requires notice of 1-6 months, and consultations with trade union if requested. Compensation for unfair dismissal 16-32 months pay.
<b>Finland</b>	Notice periods and severance pay generally set in collective agreements. No legal obligation to pay indemnities other than wages during notice period.

Norway	Legislation of 1977 requires notice of 2 weeks - 6 months unless otherwise agreed. Consultation with shop steward mandatory. Employee may appeal to the court, normally being retained on full pay meanwhile. Compensation for unfair dismissal according to court decision.
Ireland	Tribunal system judges complaints of "unfair dismissal," which if funded leads to reinstatement or up to 2 years wages in compensation. In 1983 200 cases were found in favour of employee, 370 cases against.
Austria	Notice periods of 6 weeks to 5 months. Works Council consent must be obtained. Compensation of 2-3 weeks per year of service. Reinstatement customary in event of unfair dismissal.
Switzerland	Legal minimum notice periods of 1-3 months usually extended by contract or collective agreement, which also determine severance pay.
Spain	Dismissals for economic reasons require agreement of Labour Office, which is not given before 30 days, possibly deferred by a further 30 days. Compensation for unfair dismissal up to 42 months pay.
Greece	Dismissal permitted after written notice and indemnity linked to length of service.
Portugal	Legislation of 1975 prohibits dismissal without "just cause", which covers gross misconduct, but not professional inability. Employee can appeal to the courts, which will require proof of "just cause".

Annex 2Regulations Governing Collective Redundancies

United States	No general law. 15% of collective bargains contained advance notification provisions (in 1980).
Japan	Case law establishes extensive preconditions for legally admissible redundancy of regular workers: objective need to reduce labour force, prior recourse to internal staff transfer, natural wastage, work-sharing, dismissal of temporary workers, call for voluntary retirement. Consultation of work force required. Compensation not required by law, but customarily substantial.
Germany	Legislation of 1969 requires prenotification of Labour Office and Works Council of 30 days. Labour Office may extend by a second month. Notice and compensation as for individual dismissals.
France	According to laws of 1964 and 1979, employer must first consult Works Council (which must prepare its opinion within 14 weeks) and then request authorisation of Labour Office (which may defer its decision up to 30 days). Severance pay for hourly personnel, 20 hours wages per year of service minimum. Law of 1986 abolishes role of Labour Office in authorisation and shortens statutory delays.
Italy	Following notification, trade unions may delay by 25-40 days. Collective dismissals considered practically impossible, unions tend to occupy plant until agreement negotiated.
United Kingdom	Legislation of 1975 requires earliest possible notification of Labour Office and consultation with trade unions, minimum period up to 90 days. Compensation of 1/2 to 1 1/2 weeks pay per year of service, depending upon age, with 35% subsidised by public funds for firms with less than 10 employees.
Belgium	Legislation of 1975 requires 30 days, prenotification to Labour Office, which may extend this by 60 days. Works Council must be consulted. Compensation as for individual dismissals.
Netherlands	Legislation of 1976 requires 30 days prenotification of Labour Office. Works Council and trade union have to be consulted. Labour Office must authorise. Compensation according to age and service.
Denmark	Works Council must be informed, and Labour Office given 30 days prenotification. Compensation determined by contracts.
Sweden	Notice of 2-6 months required, with consultation of trade unions, Labour Office and local authorities. Compensation by collective agreement.
Finland	Prior discussions with work force required. No legal obligations to pay compensation.
Norway	Labour Office and shop steward at earliest possible stage. No legal obligations to pay compensation.
Ireland	30 days notice, after employees have been consulted and Labour Office informed. Compensation as for individual dismissals.

- Austria** Discussions with trade unions and Works Council required at least 30 days in advance. Compensation as for individual dismissals.
- Switzerland** No general legislation. Prior notification recommended in a general collective agreement of 1975. Compensation depends mainly on collective agreement.
- Spain** As for individual dismissals, 30 days minimum prenotification; Labour Office authorisation required. Compensation 20 days pay per year of service.
- Greece** Authorisation of Labour Office required for firms with more than 20 employees, and where redundancies exceed 2% of the work force per month. Indemnities legally required.
- Portugal** Prenotification of 60-90 days given to Works Council, trade unions and Labour Office. Authorisation of Labour Office required. Compensation of 1-2 weeks pay per year of service.

### Annex 3

#### Resolution of Disputes Over Individual Dismissals in the United Kingdom - By Arbitration and Tribunal

The British system of resolving disputes over unfair dismissal is of interest in that it appears to have qualities of expedition and even-handedness that are often absent in other countries. The law provides that "every employee shall have the right not to be unfairly dismissed by his employer" (Industrial Relations Act of 1971 and Employment Protection Act of 1978).

In the period 1976 to 1982 about 40,000 cases of contested individual dismissal arose per year on average. The majority of cases are resolved in arbitration, where it often becomes evident how the case should be decided. However about 10,000 cases are heard in the industrial tribunal. About 30% of such cases tend to see the dismissed employee's complaint upheld, with the larger percentage found in favour of the employer.

The law provides that certain grounds for dismissal are automatically illegal (race, sex, marital status). Certain other grounds are automatically unfair (pregnancy, membership of a trade union, trade union activities). Capability, conduct, redundancy and "other substantial reasons" are potentially fair grounds for dismissal, depending upon reasonableness.

The industrial tribunal consists of three persons with a lawyer (in the chair), and representatives of employers and employees. Judgements allow considerable room for managerial prerogative. Thus the high court of appeal has ruled "when a man is dismissed for incapacity or incompetence it is sufficient that the employer honestly believes on reasonable grounds that the man is incapable or incompetent. It is not necessary to prove that he is in fact incapable or incompetent."

In the event of the tribunal judging that dismissal was unfair, basic compensation is awarded of 1/2 to 1 1/2 week's pay per year of service with possible entitlement to a larger amount. Reinstatement is possible but rare (3-5% of cases).

Surveys have been made of the system and of the views of claimants and defendants. Cases are generally heard within three months, and disposed of in a day or less. The system is relatively informal, and claimants often present their own cases. The majority of participants find that the time taken to reach judgements is about right, and have a favourable view of the tribunal system.

As regards the impact of the system on recruitment, brochures of the Department of Employment draw attention to the relatively low success rate of complaints against unfair dismissal, thus seeking to dispel undue fears of small employers over the difficulty of dismissal.

Source: Dickens et al (1985).

Annex 4Texts from some Japanese Judicial Decision on Dismissals

The following two cases, one concerning an individual dismissal, the other collective redundancies, illustrate the use and content of court decisions in defining the rules of dismissal in Japan. They are extracts from the court decisions, as reproduced by Sugeno (1985).

1. Abuse of Right of Dismissal

Supreme Court Judgement, January 31, 1977, Second Petty Bench (Shioda v. Kochi Broadcasting Co.) 268 Rodo Hanrei 17.

Facts: The Plaintiff had been employed by Defendant company as an announcer. He was committed the following negligence which fall into the reason of discipline prescribed in the Work of Rule of the Company.

1. Plaintiff was working overnight from 6:00 p.m. of February 22nd of 1967 until 10:00 a.m. of the next morning together with a reporter in charge of new manuscript. He overslept until around 6:20 a.m. of 23rd and could not broadcast entirely the regular news program which was due to be done for 10 minutes from 6:00 a.m. (the first failure).

2. He also worked overnight together with another reporter from 7th to 8th of March of the same year and again missed a news program for 5 minutes from 6:00 a.m. in the morning of 8th (the second failure).

3. He failed to report the second failure to his superior and submitted a report with some camouflage when he was requested to report by the director of his section around March 14th and 15th. The Company did not take a disciplinary punishment (discharge) but simply dismissed him taking his future fate in consideration. Plaintiff brought the case to the court asking to confirm his employment status holding that the dismissal is too severe and abuse of right of dismissal. In both of the first and second instances the Courts admitted the Plaintiff's request and declared the dismissed null and void. The Supreme Court sustained the original judgement.

Excerpt of the Court's Opinion

Plaintiff's above described failures in this particular case fall under the reason of (ordinary) dismissal prescribed in the Article 15, No. 3 of the Work Rule of the Company too. However, even when there is a reason of ordinary dismissal the employer is not always permitted to dismiss the employee. The dismissal could be null and void as abuse of the right of dismissal when the the dismissal is extremely unreasonable and not to be admitted to be appropriate based on the common sense of the society depending on the actual situations of the individual case. In this particular case, two failures he had committed were in their nature something to damage the social credit of the Company. The fact that he had overslept and caused the same kind of failure twice in two weeks showed his lack of responsibility as an announcer. Furthermore, he had not admitted his failure in the second case not straight-forward. All these points he is certainly not blameless. However, judging from the facts confirmed by the original instances his failures were not caused by his malice or on purpose but by his negligence, namely oversleeping. It is rather too harsh to blame only Plaintiff since in both cases of his failure the reporters were supposed to wake him up but they also overslept and failed to wake up and to give him the manuscript of the news program. Plaintiff had apologized immediately after his first failure and in the second case he tried to start work as soon as he woke up. In both cases the vacant period of broadcasting was not so long. The Company was not taking a perfect arrangement to secure the early morning new program. His submission of a camouflaged report was partly a result of his misunderstanding of whether the door of the first floor was closed or not and partly a result of his awkwardness because of his repeated mistakes in a short period. Judging from all these points he is not to be strongly blamed. He has committed no failure in

announcement work until this time. His performance has been not particularly bad in the past. The reporter in the case of the second failure was punished only by warning. No announcer was dismissed because of the failure in broadcasting in the past. Plaintiff has finally apologized for the second failure too. Judging from these circumstances to dismiss him is rather too severe and tends to lack in reasonableness. Thus it could possibly be regarded as inappropriate in the common sense of the society. Therefore the judgement of the original instance holding the dismissal of this case as abuse of the right of dismissal and null and void is proper.

## 2. Dismissal Due to Closing Down of Division

Tokyo High Court Judgment, October 29, 1979 (Toyo Sanso K. K. v. Koji Shimazaki et al.)

### 30 Rominshu 1002

**Facts:** The Appellant, having its principal office in Tokyo and business offices and factories in eight locations throughout Japan, is engaged in the business of manufacturing and selling various high pressure gases such as oxygen, acetylene and liquefied petroleum gas. (As of 1970, the amount of capital was 1,520,000,000 Yen, and the number of employees as 532.) The Appellant decided to close down its entire acetylene division and on July 24, 1970 informed all 47 employees of the division, including another 12 other appellees, of its intention to dismiss them. This action is a request for a preliminary injunction for a preserving position filed by the Appellees, 13 employees among the 47, asserting that this dismissal is an abuse of the dismissal power.

Tokyo District Court (April 19, 1976, 255 Rohan 58) granted the Appellees' petition. That is, the first trial held that "in order for the dismissal of the Appellant's employees in a certain division which has been closed down to be considered valid when as, in the instant case, the Appellant asserts unavoidable business necessity; the closing down of the division should be reasonable from a management point of view, as should be the dismissal of the employees, and moreover the dismissal procedures should be generally acceptable to society." The court found that the first condition had been satisfied for the following reasons. In general, even when the management for unavoidable reasons has to close down a specific business division it goes without saying that the employees in the division should hopefully be minimal. Therefore, when the Appellant closed down the acetylene division, it should have tried to avoid dismissal of the employees in the division as much as possible by taking steps such as transferring the employees to the Appellant's other business divisions, or by calling for voluntary retirement among the employees in the division or in the whole company. If the Appellant dismissed all the employees in the division without taking such steps in spite of the fact that it was able to do so, then it can be said that the dismissal was not unavoidable from a business management point of view.

### Excerpts From the High Court's Opinion

The judgement of the Tokyo District Court shall be reversed, and the petition of the Appellees shall be dismissed.

In general, an enterprise can freely decide to close down a specific business division, since it is a decision with respect to management policy within its exclusive discretion. This does not directly mean, however, that the enterprise, as an employer, can freely dismiss the employees in the division when it decides to close down the division. In order for the employer's decision dismissing the employees in the division to be justified as being based upon "unavoidable business necessity," the following requirements shall be met and considered sufficient except in unusual circumstances. First, the closing down of the business division must be found to be based upon unavoidable necessity from the viewpoint of reasonable management of the enterprise. Second, the dismissal for the reason of the closing down of a business division should not be arbitrary on the employer's part. Such a dismissal can be held not arbitrary only if there is no room for transferring the employees to identical or similar jobs in the other business divisions in the same or other business locations not far from the original place of business, or if there is no way to avoid a surplus of employees in the whole enterprise even after the execution of the

above-mentioned transfer. Third, the selection of the actual retirees should be based on objective and reasonable criteria.

Annex 5Conclusions of a Study by (Manes and Rosenbloom of the Harvard Law School) on the United States Legal System for Handling Disputed Individual Dismissals (Excerpts)

"The Current system for handling claims of unfair discharge, if one may call it a system at all, is not working. The courts continue to create more problems than they resolve. Society, as well as employers and employees, has been ill served by the law's response to the problem of unfair discharge. The conclusion seems unavoidable that legislation is required to balance the interests of all concerned.

"Our survey of the current case law leaves little room to doubt that the judicial system does not adequately promote the interests of employers or employees. By its very nature the litigation process is slow, costly, and formal. Some commentators claim that the courts lack the necessary labor expertise and perspective to properly address unfair discharge problems. Clearly courts have been anything but uniform in their decisions, as judges have attempted to combat perceived unfairness by formulating rules which often are both over and under inclusive. Ultimately, these rules are ill tailored to protect either the employees' or employers' interest. Further, handicapped by the limited remedies a judge can adopt, and the erratic manner in which juries allot compensatory and punitive damages, the courts are destabilizing the employment relationship.

"Case by case adjudication has proven to be a poor way of regulating the employment relationship. Already courts have begun to express the fear that their duty to develop a common law of wrongful discharge threatens to render the court a bargaining agent for every employee not protected by statute or collective bargaining agreement.

"The courts themselves recognize the need for legislative action. Although sympathetic to the unfairness that may accompany the dismissal of an at-will employee, many courts nonetheless feel that the legislature is the appropriate agency for effecting a change in policy regarding the employer-employee relationship. In Murphy v. American Home Products Corp., New York's highest court refused to recognize the tort of wrongful discharge. The court reasoned:

Those jurisdictions that have modified the traditional at-will rule appear to have been motivated by conclusions that the freedom of contract underpinnings of the rule have become outdated, that individual employees in the modern work force do not have the bargaining power to negotiate security...and that the rule yields harsh results for those employees who do not enjoy the benefits of express contractual limitations on the power of dismissal. Whether these conclusions are supportable...are issues better left to resolution at the hands of the legislature.

...If the rule of nonliability for termination of at-will employment is to be tempered if should be accomplished through a principaled statutory scheme, adopted after opportunity for public ventilation, rather than in consequence of judicial resolution of the partisan arguments of individual adversarial litigant...

"Similarly, the Connecticut Supreme Court recently noted:

What categories of employment should be given [protection] and what criteria should determine whether there exists good cause for a discharge are questions which the General Assembly may deal with more comprehensively than the courts.

"In view of the erratic and inconsistent judicial development of the law of 'unfair discharge', we believe a better approach to the problem may be found in state legislation. Moreover, there

is more that recommends a legislative approach than simply the failure of courts to provide a comprehensive and effective solution to the wrongful discharge problem. The policy issues that arise are intensely political, and resolution of these issues will not be found merely by referring to the 'brooding omnipresence' of the common law, but rather by informed public discussion. The history of labor regulation in this country has of necessity been a history of balances and trade-offs. It is this 'trading-off' of employer and employee interests that legislatures are uniquely qualified to perform."

Source: Manes and Rosenbloom (1985).

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# Selected Labor Market Reforms

*Aline Coudouel and Pierella Paci*

Overall, in recent years, the policy advice of bilateral and multilateral donors to policymakers in developing countries has been centered on reducing the degree of government intervention in the functioning of the labor market and on increasing the liberalization of labor market institutions. Underpinning this advice is the traditional neo-classical assumption that the *laissez-faire* approach ensures the highest social welfare by promoting labor market efficiency and job creation.

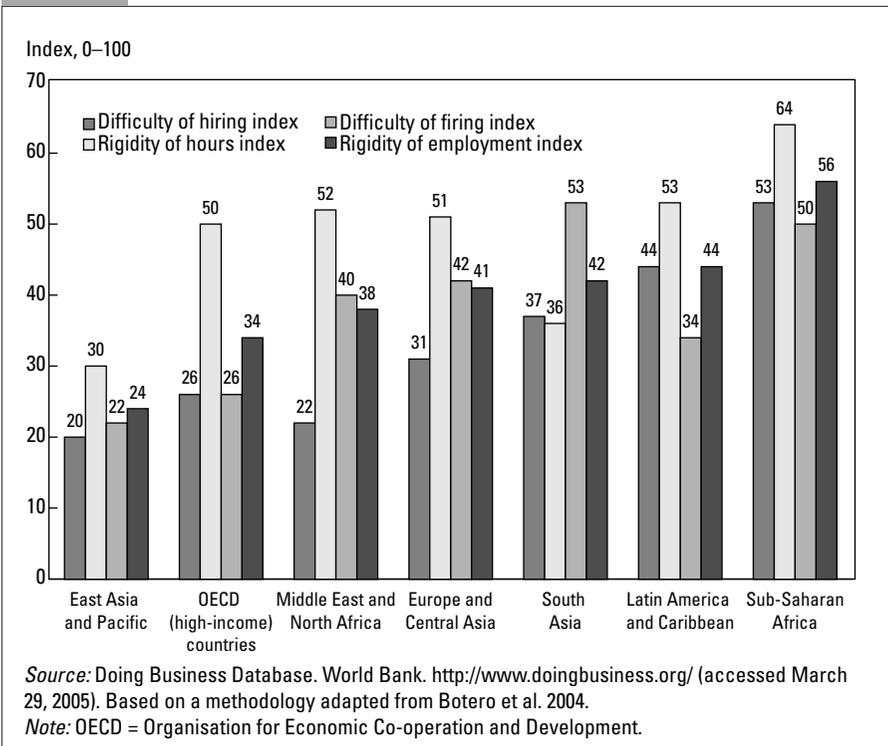
However, this view has long been challenged by those who see in the many market failures in the labor markets of developing countries the need for a more active role for labor market policies. A number of non-competitive theoretical frameworks question the efficiency of unregulated markets, provide a rationale for different types of labor market interventions, and, in combination with the *Theorem of Second Best*,<sup>1</sup> challenge the view that liberalization always leads to increased efficiency. In addition, the strongest criticism of the *laissez-faire* approach is based on considerations of equity and on poverty reduction objectives on the grounds that the outcomes of unregulated, competitive labor markets are not necessarily consistent with the social justice objective. The different definitions of social justice or *equity* preclude any simple answer to this question (Barr 1993). However, the claim becomes much easier to assess when the focus is on poverty and on income distribution. The argument here is that labor market interventions reduce inequality in labor incomes by (1) maintaining earnings at the lower end of the income distribution above the level at which they would have been in an unregulated market, and (2) reducing the vulnerability of earnings.

Employment is widely perceived to be among the most important channels through which the poor can move out of poverty. This is mainly for two reasons. First, labor is the most abundant asset of the poor, and, second, what distinguishes the poor from the non-poor is labor incomes: labor force status is repeatedly found to be a critical determinant of household welfare in developing countries. Thus, among other studies, the recently released “Pro-Poor Growth in the 1990s: Lessons and Insights from 14 Countries” (World Bank 2005) highlights employment as a crucial link between growth and poverty reduction; it identifies labor market regulations and segmentation and the links between the investment climate and employment as priority areas for pro-poor growth strategies. Yet, access to jobs is not sufficient; the existence of so many *working poor* underlines the importance of the availability of jobs that offer some degree of security and pay *decent* wages.

From this arises the essential role of labor market policies designed to improve job security and guarantee a decent wage for the most vulnerable workers. However, this potential role would clearly be significantly reduced if the security of decent labor incomes for some was achieved at the cost of reduced employment opportunities and more inadequate working conditions for others. This raises important challenges for policymakers, such as: (1) how to design a package of labor market policies that reconcile the right of workers to secure and decent wages—which is essential for reducing poverty and labor market vulnerability—with the overall objective of widening employment opportunities; (2) how to implement any necessary reform of the existing package of interventions; (3) how to quantify the potential distributional impact of any such reform; and (4) how to minimize the welfare costs to those people who would lose out from these changes.

These are important issues for development as, contrary to expectations, the developing world generally tends to have relatively rigid labor laws governing the relationship between employers and employees. This is evident in Figure 3.1, which presents four indexes of labor market rigidity, ranging from 0 to 100, from least to most rigid. The indexes are as follows:

- the difficulty of hiring index, which is based on the legality of part-time and fixed-term contracts and their applicability
- the rigidity of hours index, which is based on the rules that govern the hours of work (maximum, treatment of night-shift work, overtime, and so on), the policy toward work leaves, and the minimum wage

**FIGURE 3.1 Selected Indexes of Labor Market Rigidities across Regions**

- the difficulty of firing index, which is based on the grounds allowed for firing, the firing procedures in place, the firing notification requirements, the size of severance payments, and whether the right to job security is enshrined in the country's constitution
- the rigidity of employment index, which is a synthesis of the three indexes above

Figure 3.1 shows that, with the exception of the East Asia and the Pacific Region, formal labor markets in all regions exhibit labor market rigidity that is greater than the average for the countries of the Organisation for Economic Co-operation and Development (OECD). The greater rigidity is particularly evident in firing restrictions and employment regulation. The rigidities are especially substantial in Sub-Saharan Africa, where all the indexes are in excess of 50, and hiring and firing are twice as difficult than they are in the OECD countries. At the other end of the

spectrum are the East Asian countries, which have, on average, much less stringent laws.

However, it may be misleading to derive conclusions about the overall degree of the rigidities of the labor market from the findings shown in Figure 3.1. This is because the coverage of these laws and their level of implementation vary considerably from country to country partly as a reflection of the size and structure of the informal sector. Indeed, for most, labor market policies only apply to a subset of the workforce, namely, those people in the formal sector. As shown in Table 3.1, the size of this subset varies considerably across regions and countries, but it represents over 40 percent of gross domestic product in Africa and Latin America and 35 percent in the transition countries of Europe and Central Asia. In addition, in countries with weak implementation capacity, large pockets of unprotected employment persist even in the formal sector.

This suggests that labor market legislation directly affects employment conditions only for a relatively small percentage of the workforce in the developing world. Nevertheless, it is likely to affect the incomes and the vulnerability to poverty of a much larger part of the population than the small percentage covered by the policy. Indeed, evidence has emerged that conditions prevailing in the formal sector have indirect effects on the informal sector by, for example, raising the average wage in both sectors. More importantly, the degree of intervention prevailing in the formal sector may represent a barrier to job creation in general and to the employment of new workers in particular. It may also affect the size and structure of the informal sector: informality may be more widespread, and the gap between the formal and informal sectors may be larger in economies with more highly regulated labor markets.

**TABLE 3.1. Average Size of the Informal Economy in Terms of Value Added, by Region, 2000**

<i>Region</i>	<i>Value added (% gross domestic product)</i>	<i>Countries covered (number)</i>
Africa (including North Africa)	41.0	23
Latin America and the Caribbean	41.0	18
Middle East and Asia	29.0	26
Central and Eastern Europe and Central Asia	35.0	23
Western European OECD	18.0	16
North America and Pacific OECD	13.5	4

*Source:* Schneider and Klinglmaier 2004.

Thus, labor market policies and policy reforms are an important determinant of income distribution and poverty incidence even in countries where the relative importance of the covered sector in the overall labor market is small. This is because of the indirect effect of the policies and the reforms on the rest of the economy. Indeed, when the focus is on improving overall social welfare and reducing poverty, labor market interventions may act as a double-edged sword by protecting the income levels and security of those covered by the policies, the *insiders*, while increasing the vulnerability of the rest of the population, the *outsiders*, who may face increasing barriers to employment and have access only to jobs in the uncovered sector of a typically *dual* labor market.<sup>2</sup> For this reason, any reform of the prevailing labor market is unlikely to be Pareto neutral. It will leave some members of society worse off, while improving the living standards of others and will therefore have an important distributional impact. Who the winners and losers will be will depend on a number of factors, ranging from the type and direction of the reforms—that is, more intervention versus increased liberalization—to the characteristics of the labor and output markets.

In deciding on the implementation of these policies and reforms, policymakers should thus be fully aware of the potential direct and indirect impacts on the distribution of income at both the individual and the household levels so that the full significance of the policies and reforms in terms of efficiency, equality, and poverty reduction can be adequately evaluated.

The objective of this chapter is to provide policymakers with the tools they need to conduct such an evaluation. The chapter first describes a variety of labor market policies, focusing on three of these policies. It then describes possible reforms of these policies and the rationale behind the reforms. The subsequent section illustrates the channels by which the reforms may impact income distribution and poverty. The following section identifies the stakeholders involved in each of the reforms analyzed. Finally, the tools of analysis and the main impacts of the reforms as identified in the empirical literature are outlined.

The chapter is not intended as a full-scale analysis of the pros and cons of particular labor market policies and reforms, but more simply as a guide to the comprehensive evaluation of potential distributional impacts. Thus, the attention is on the possible effects on income inequality and the incidence of poverty rather than on the efficiency of the system or the existence of a trade-off between efficiency and equity considerations.<sup>3</sup>

## LABOR MARKET POLICIES

The types of labor market policies implemented in countries are many and varied. In the interest of maintaining a tight focus, the analysis in this chapter is limited to the potential distributional impacts of reforms in three areas of labor market policy that are of particular relevance to developing countries, namely, the minimum wage, employment protection legislation, and unemployment benefits.

The chapter neglects other types of labor market policies and reforms<sup>4</sup> and the potential interactions of these reforms with the conditions prevailing in other areas of the labor market.<sup>5</sup> In addition, the analysis takes a partial-equilibrium approach and does not deal with the issue of possible interactions between, on the one hand, capital and product market institutions and reforms and, on the other, the reforms of labor market interventions; nor does it address the potential impact of labor market reforms on the competitiveness of a country vis-à-vis its neighbors. These are important limitations because the status and the sequencing of reforms in product and labor markets are clearly interrelated, and the changes in labor costs brought about by reforms may have important second-round effects on labor market outcomes and income distribution, as shown by the examples in Box 3.1. However, the decision to focus on only three types of labor market policies and to analyze these three in isolation from other reforms both within and outside the labor market is dictated by the need to keep the task within manageable dimensions.

### BOX 3.1 Labor Market Reforms Do Not Happen in a Vacuum

Recent empirical literature on economic liberalization has unveiled a number of interactions among labor market reforms, their impact, and the conditions prevailing in other markets. For example:

- Evidence from South Asia points to the importance of industrial policies in determining the impact of labor market reforms.
- Trade liberalization appears to have led to the expansion of the informal sector in Colombia until a major labor market reform also increased the flexibility of the labor market (Goldberg and Pavcnik 2003).
- Soaring minimum wages and labor costs in Indonesia are believed to have eroded the country's competitiveness (Agrawal 1995).
- Analyses of European countries show that the effects of shocks depends on the nature of institutions. Shocks have a larger and more persistent effect in countries with poor labor market institutions, and a similar shock has differentiated effects on unemployment when labor market institutions differ (Blanchard and Wolfers 1999).

## The minimum wage

Minimum wage legislation sets a lower bound to the wages paid to individual workers. The conceptual definition is very simple, but the scale, eligibility, and policy design differ considerably from country to country. The majority of countries opt for a single national minimum rate set on an hourly, daily, weekly, or monthly basis. Beyond the single national wage, a reduced or subminimum rate is sometimes applied for some groups of workers, notably, youth, the unskilled, or the long-term unemployed; for most workers, subminimum rates sometimes exist de facto, because special employment programs allow employers to pay lower wages for young workers. In other countries, minimum wage premiums are sometimes used that are related to worker characteristics. For example, the minimum wage may rise according to worker experience, worker qualifications, or worker family status.

In addition, different minima may be set for different regions, occupations, or industries. This is particularly common in Latin America. For example, in Argentina, there are dozens of minimum wages set for agricultural workers, while one minimum wage is set for all other economic activities (World Bank 2006), and, in Mexico, wages are set separately for three regions and 88 occupations (Gindling and Terrell 2004a). Countries also vary in the process they adopt to set the minimum wage. The government sets it unilaterally in some countries. In others, it is the result of negotiations between representatives of workers and firms. In a number of countries, it is indexed to price inflation. The available information on selective features of minimum wage policies across countries is summarized in Table 3A.1 in the annex to this chapter.

Such diverse approaches make international comparisons of minimum wages difficult. Nevertheless, cross-country comparisons can be made by measuring the value of the minimum wage relative to some measure of average wage (the *Kaitz index*). Maloney and Mendez (2003) provide estimates for the Kaitz index for most Latin American countries. They find a large variance across countries. Argentina, Bolivia, Brazil, Chile, Mexico, and Uruguay represent the lower bound (with a Kaitz index around 20–25 percent), while El Salvador, Honduras, Paraguay, and Venezuela are among the countries with the largest values (with estimates around 50–60 percent). The evidence for African countries is less readily available. Jones (1998) finds that, in Ghana, the Kaitz index for manufacturing workers fell from 50 percent in the early 1970s to around 20 percent in the early 1990s.

## Employment protection legislation

Employment protection legislation refers to the set of norms and procedures to be followed when hiring or dismissing workers. The legislation typically obliges employers to give workers a monetary compensation in case of early termination of permanent contracts and imposes procedures to be followed in case of individual or collective layoffs.<sup>6</sup> It also imposes constraints on the type and length of the available contracts, for example by limiting the use of temporary contracts.

Typically, the legislation governs *severance payments* and *advance notice*. A *severance payment* is a monetary transfer to a worker in case of firm-initiated layoff. The payment may include compensation for unjustified dismissal, seniority premiums, and compensation for wages forgone during any legal process if the worker brings an action against the firm,<sup>7</sup> and so on. An *advance notice* is a specific period of time allowed to the worker before a layoff can be implemented. Firms typically either provide notice and keep the workers during the notice period or provide a compensation equivalent to the wages that would have been earned during the notice period. When workers continue on the job during the notice period, their level of effort is likely to be reduced, which translates into an extra cost for the employer. In addition to mandatory payments, some firms and sectors also have collective agreements that specify other requirements. These components of the legislation can be conceived of as *monetary transfers* similar in nature to wages.

Another aspect of the legislation is the *administrative procedures* that must be followed. In most countries, the employer is required to discuss layoff decisions with the representatives of the workers. In some countries, dismissals must be approved by authorities (for example, India), and, in most countries, the legislation distinguishes between *individual* and *collective dismissals*. Within individual dismissals, a distinction is usually made between economic dismissals and disciplinary dismissals (often not covered by the legislation). The procedures for collective dismissals apply to large-scale restructuring and typically impose tighter administrative burdens in the form of prolonged consultations with worker representatives. The legislation may also govern the distribution of legal costs if workers contest dismissals by initiating court proceedings. These components of the legislation can be conceived of as “*taxes*” since they correspond to payments to third parties.

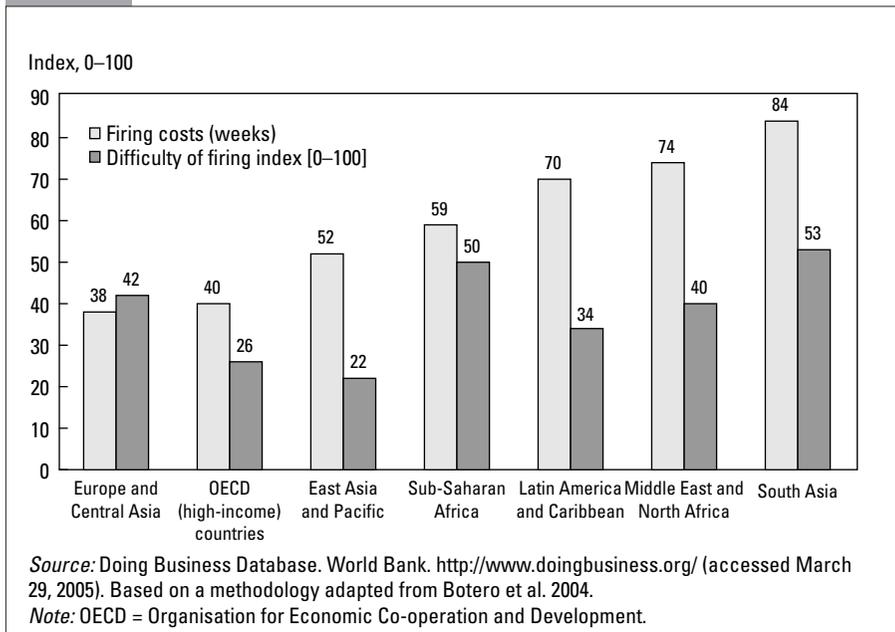
The multifaceted character of the legislation throughout the world makes international comparisons of the nature and comprehensiveness of the legislation difficult. However, several synthetic measures of the rigidity of the legislation exist. International comparisons of two of these

indicators are illustrated in Figure 3.2. The figure shows the *difficulty of firing index*, which ranges from 0 (least rigid) to 100 (most rigid), and the *firing costs* expressed in weeks. Figure 3.2 indicates that firing existing workers is far more difficult in the developing world than in OECD countries. Firing is two times more difficult in South Asia and Sub-Saharan Africa than in the OECD. Firing costs are also much higher in developing countries than in OECD countries. In South Asia, they are over twice those in the high-income countries of the OECD.<sup>8</sup> A more complete breakdown of the values of synthetic indicators of the strictness of employment protection legislation by country and region are provided in Table A3.2 in the annex to this chapter.

### Unemployment benefits

The objective of unemployment benefits is to provide income to individuals during spells of unemployment. Typically, the systems function as insurance schemes, whereby the amount and duration of the benefit are based on the worker's employment history, past contributions to the system, and most recent wage (unemployment insurance). Some schemes

**FIGURE 3.2** An International Comparison of Selected Indicators of Employment Protection Legislation



also include a component that is independent of the worker's profile and (usually) provides flat benefits to individuals with long unemployment spells or who are below a certain income level (unemployment assistance). In most developed economies, unemployment benefits are combined with other transfers designed to supplement income for individuals who are out of work, such as early retirement schemes, invalidity pensions, and social assistance benefits. In addition, alternative ways of supporting the income levels of the unemployed while increasing their reemployment opportunities have recently been tried by a number of countries. These policies, commonly referred to as active labor market policies, vary substantially in their characteristics and in the degree of their success both as safety nets and as a means of reemployment. Vodopivec and Raju (2002) offer an extensive review of alternative systems of income support for the unemployed and an evaluation of the relative merits.

Several key features characterize an unemployment benefit system. Among these are the level of payments, the duration of the payments, and the eligibility requirements. To deal with the size of the benefit and the length of time during which the benefit is provided, the OECD tabulates a "summary measure of benefit generosity," defined as the average replacement rate during the first two years of unemployment for an "average production worker" having sufficiently long seniority to be offered the benefits up to their maximum duration. Another useful indicator is the coverage rate, that is, the fraction of the unemployed population receiving benefits. This measure depends on the duration of the benefits and the characteristics of unemployment (in particular, the share in unemployment represented by those individuals who typically do not benefit from the system because of a lack of work experience).

### **The potential interaction between different policies**

The three policies highlighted in this chapter interact in interesting ways. This is particularly true of the unemployment benefit and employment protection legislation because the effects of the benefit are likely to differ depending on how flexible the legislation is, and, to a degree, the legislation and the benefit can substitute one for the other. However, in order to maintain a tight focus, this chapter does not address the topic.

## **TYPES OF REFORMS AND THE RATIONALE OF REFORM**

The rationale for labor market intervention has traditionally been based on the argument that the market for labor is a very special type of mar-

ket because of its nature and the fact that it deals in people rather than goods. This makes issues of equity particularly important and also makes the occurrence of market failures more likely and worrisome. In the view of many, this implies that an unregulated labor market would lead to outcomes that are inequitable and inefficient and that some form of intervention is required to increase the efficiency of the labor market and enhance the equity of its outcomes. However, many other people believe that the acceptance of this argument has caused labor markets to become excessively regulated in numerous wealthy and less wealthy countries and that this has led to outcomes that are neither efficient nor equitable. Based on these two competing views, calls for reform have focused on the implementation or strengthening of interventionist policies or on their weakening. For the most part, this has led only to marginal changes designed to alter the coverage or the generosity of systems.

### Reforms of the minimum wage

In addition to the setting or elimination of a minimum wage, reforms in the area of the minimum wage are typically of two types: those that either increase or decrease the average value of the wage threshold and those designed to introduce subminimal wage floors for particular groups of workers (such as the unskilled, youth, or the long-term unemployed) or locations or regions (areas of high unemployment or poor areas). The main rationale for a generalized increase in the minimum wage is the need to ensure a *living wage* to all workers and concerns about excessive wage inequalities. In such a context, the introduction or increase of a minimum wage acts as an instrument for redistributing income within a formal labor market characterized by large numbers of “working poor.”<sup>9</sup>

On the other hand, a reduction in the average minimum wage or in the minimum wage of specific types of workers is advocated when the existing level of the relevant minimum wage appears to act as a barrier to employment either across the board or among workers characterized by particularly low productivity, typically youth, the unskilled, or the long-term unemployed. The introduction of regional variations in the minimum wage may also be advocated in a context of differences in the cost of living across regions or systematic differences in labor demand or skill levels across parts of a country.

Thus, these contrasting proposals reflect two different views of the impact of the minimum wage and of minimum wage reforms. One view stresses the *redistribution dimension* of the minimum wage, while the other view stresses the *quantity crowding out* dimension. These two different

views also reflect the key transmission mechanisms of the minimum wage, as described in more detail below.

### Reforms of employment protection legislation

The range of possible reforms in employment protection legislation is large, but the reforms are mostly linked to concerns about long-term unemployment and large pockets of unemployment among specific groups, typically the young and women. Any legislative initiative that induces a change in the regulations on individual or collective dismissals can be considered a reform in employment protection legislation. Furthermore, since the rigidity and enforcement of the legislation depend also on the way the judicial system applies and interprets the legislation, changes in the functioning and organization of the judicial system are also an important factor in legislative reforms.

One may distinguish between radical and marginal reforms. *Radical reforms* typically refer to changes in the regulations that apply to all jobs (for example, changes in the level of severance payments, the length of the required advance notice, the definition of fair dismissal, court procedures and the burden of proof, collective dismissal procedures, and so on). *Marginal reforms* refer to changes that apply only to newly created jobs. These include changes in the regulations on temporary or atypical contracts (for instance, interim contracts) and so on.

As shown in Table 3.2, by far the most popular reforms in employment protection legislation in Europe since 1985 have been marginal ones. Each country has, on average, undertaken one reform every other year, and the reforms have reduced or increased protection in equal shares.<sup>10</sup> The numerous reforms have led to an expansion in contractual types and a growth in the number of both fixed-term and unstable jobs, as well as permanent and still heavily protected positions. This has increased the dualism in European labor markets, making them more segmented not only with respect to insiders and outsiders, but also with respect to various sorts of outsiders.

**TABLE 3.2. Employment Protection Legislation Reforms in Europe since 1985**

	<i>Increasing protection</i>	<i>Decreasing protection</i>	<i>Total</i>
Structural reforms	7	4	11
Marginal reforms	59	53	112
Total	66	57	123

Source: Social Reforms Database. Fondazione Rodolfo DeBenedetti. <http://www.frdp.org> (accessed February 5, 2003).

## Reforms in unemployment benefits

The main reforms in unemployment benefits consist of changes in the duration of benefits, in entitlements, and in replacement rates. The reforms are often designed to realize policies to encourage labor market activity and labor force participation or to increase the incentives for unemployed individuals to take up jobs. In addition, a number of countries have also recently been experimenting with alternative ways to support the income levels of the unemployed, while increasing their reemployment opportunities. These policies, commonly referred to as active labor market policies, vary substantially in their features and in the degree of their success as safety nets and as a means to boost reemployment.

An analysis of reforms in unemployment benefits in the European Union since 1987 shows that reforms in basic benefit systems are numerous, with an average of two reforms in each country every three years. Most of these reforms have aimed at augmenting benefits, but have only entailed marginal changes (that is, phasing in new beneficiaries rather than changes in existing entitlements) or have increased the rewards for labor market participation by altering the incentive structure. Finally, reforms have typically taken place during phases of economic growth and have often involved simple changes in administrative rules, for example, requiring more frequent visits to an employment office before one is eligible to receive benefits or rewriting the definition of “suitable job offer.” This reflects the fact that the implementation of administrative reforms during economic growth is often less controversial than changes in benefit levels.

To avoid the opposition of people already covered by the system, more radical reforms to benefit systems are typically implemented little by little via marginal adjustments in benefits and a gradual narrowing of entitlements. Benefit reforms therefore usually “grandfather” existing entitlements by exempting those individuals who are receiving benefits at the time of the reform and allowing for the new rules to be phased in. An important exception is represented by the case of the former planned economies of Central and Eastern Europe, where fiscal constraints and the need to set right the perverse incentive structure that prevailed before the transition led to dramatic reforms, which, in some instances, severely reduced benefits and halved the maximum duration of benefits (Boeri 2000).

There are three main reasons for carrying out reforms in unemployment benefits. The first relates to the observed positive correlation between the duration of a benefit and the *duration of unemployment*. Exits from unemployment are found to respond strongly to the benefit-entitlement period (the exit rate increases as workers near the end of their

entitlements). A second reason relates to the effects of benefits on *unemployment levels*. More generous benefit systems tend to be associated with higher unemployment rates because of longer unemployment and because of a dampening effect on entries into the workforce. A third reason for benefit reforms is the *fiscal cost* of the benefit system that, in conjunction with other nonemployment benefits, may account for a significant proportion of social spending.

### **The argument for implementation and strengthening of labor market interventions**

From an efficiency perspective, the arguments for significant intervention in the labor market focus on the existence of different causes of *market failure*. First, the efficient working of a market under *laissez-faire* conditions requires full information flows. However, the substantial degree of heterogeneity among workers and jobs makes information flows highly complex and the costs of acquiring and updating information extremely high, leading to the use of infrequently updated stereotypes that distort decisionmaking and may put some groups systematically at a disadvantage, that is, either by being discriminated against in employment decisions or by being paid less than their marginal value product. Second, the presence of externalities may distort the relationship between individual utility-maximizing objectives and the overall objective of maximizing social welfare. A third potential source of market failure may arise when product market monopolies, trade unions, or a labor market monopsony cause the relationship among productivity, real wages, and employment to be distorted, leading to inefficiency in resource allocations.<sup>11</sup> Finally, the failure of markets for goods, services, and resources to perform efficiently may distort the operation of demand and supply.

Box 3.2 provides examples of the different categories of labor market failures discussed above. It is important to note that these are not mutually exclusive. On the contrary, they may interact to generate widespread market failures. This is particularly evident in the case of unemployment insurance.

An additional argument for labor market intervention derives from the fact that contracts for employment are more likely to be incomplete than are contracts prevailing in goods and output markets because of the “idiosyncratic” character of labor as a factor of production. Indeed, contracts involving the exchange of labor have dimensions other than duration and terms of employment that cannot be easily quantified or communicated, such as attentiveness, effort, and creativeness. Since these

**BOX 3.2 Examples of Types of Market Failures in the Market for Labor**

The following are examples of the four prevailing types of failures of the market for labor in developing countries.

1. *Asymmetric information.* In many situations, information is available asymmetrically in the labor market. This is a particular problem in markets with less effective reputation effects, that is, markets characterized by small firms, mobile workers, and informal contractual arrangements.
  - Firms may find that it is expensive to discover the true characteristics of applicants, and job-seekers may find that it is difficult to discover the true characteristics of job offers.
    - Off-the-job search is inefficient.
  - Employees may be unable to obtain full information on job-security arrangements in their current jobs.
    - They may make inefficient decisions about training and job-seeking.
  - Firms may conceal their difficult financial situations in order to prevent new job-seeking and departures by their most valuable workers.
2. *Externalities.* There are many examples of externalities in this area.
  - In deciding whether or not to close a branch, firms are unlikely to internalize the costs to local workers or to the government in the form of lost tax revenues and increased benefit payments.
  - In deciding whether or not to accept jobs, unemployed job-seekers are unlikely to take into account the costs of their refusal for firms or for the government.
  - If firms or workers are prepared to internalize these costs, free-riders who have failed to do so may nevertheless share in the resulting benefits.
    - Private decisionmaking in the unregulated labor market is inefficient because it does not internalize these costs.
3. *Monopoly power* may result from a number of factors both in the labor market and the product market and affect both demand and supply.
  - The existence of technologies idiosyncratic to a particular firm means that skills obtained through on-the-job training cannot be transferred to other employers. This makes labor turnover costly.
    - Virtually all employees and firms possess some degree of monopoly power.
    - Labor mobility is restricted; the labor market is not competitive, and wages may not clear.
  - Trade unions or monopolistic behavior may lead to similar distortions in the wage and employment equilibrium.
4. *Absence of markets for goods and services* may distort the operation of both the demand side and the supply side of the labor market.
  - The investment decisions of individuals may be distorted by the inability of workers to realize the value of their human capital in the same way they sell their financial assets.
    - There will be underinvestment in education and training.
  - The inability to obtain full insurance against redundancy because of the risk of moral hazard may distort interfirm mobility.

dimensions are not specified in the contract, they cannot be enforced, and the agency problem results. Thus, contracts need to be designed to increase the incentives for workers to behave in a manner that is consistent with the interest of employers, that is, supply-acceptable levels of effort and so on, or, more technically, “no shirking.” These incentive mechanisms may involve piece-rate systems of pay or internal promotion that may distort the operation of market forces, leading to the development of internal labor markets and requiring intervention.

Finally, Keynes argued that, in the context of a more aggregate approach toward labor contracts, competitive labor markets are prone to coordination problems, resulting in aggregate market failures and persistent aggregate unemployment. These difficulties derive from the fact that contracts are negotiated at regular, but potentially long intervals and in terms of money wages. Meanwhile, worker demands are motivated in terms of real wages, and the offers of firms are motivated by labor costs. This means that any adjustments will be achieved through employment rather than wages. More recently, the “new growth theory” has expressed concerns about the ability of unregulated labor markets to produce optimal growth performance because of the failure of private employers to internalize the full development benefits of the existence of a trained and educated labor force.

However, the argument most often used to justify labor market interventions is the one based on *equity*. Many question the capacity of an unregulated labor market to produce an outcome that is socially acceptable given the fact that the trade in individual labor is involved. The various definitions of social justice or equity preclude any simple response (Barr 1993). Nonetheless, calls for equity become much easier to address when the focus is on poverty reduction since employment at a “decent” wage is widely perceived as the most important channel through which the poor can move out of poverty. It is also somewhat easier to evaluate the impact of policies on earning distribution and on earnings variability. This is because labor market policies, for the most part, are designed to reduce inequalities in labor incomes by maintaining earnings at the lower end of the income distribution above the level at which they would have been in an unregulated market, as well as to minimize income vulnerability in the light of possible dismissal, unemployment, and so on.

### **The argument for less labor market intervention**

In recent years, the policy advice of bilateral and multilateral donors to policymakers in developing countries has been centered on reducing

government intervention in the labor market and increasing the liberalization of labor market institutions. Underpinning this advice is the conviction that, despite the clear potential for market failures and the active role labor market policies can play in promoting a more equitable distribution of incomes and in reducing poverty, labor markets across the world tend to be overregulated. This overintervention may result in significant efficiency costs that lead to a trade-off between efficiency and equity. Furthermore, some have argued that, in the name of equity and fairness, excessive intervention may ultimately hurt those very groups it is designed to protect: the vulnerable and the poor. This can happen in a number of ways.

At the simplest level, overintervention may result in excessive government expenditure, and the imposition of taxes to finance this expenditure will reduce efficiency. Taxes will distort key relative prices, such as those between work and leisure on the supply side and those between labor and capital on the demand side. These distortions cause labor market behavior to deviate from that consistent with economic efficiency by, for example, discouraging formal employment, reducing employment potential, or generating growth in the uncovered, untaxed informal sector at the expense of the formal one. Similarly, interventions in the minimum wage or through employment protection legislation, by prohibiting employment under certain conditions, reduce the freedom of choice of workers and employers. When excessive, they may prevent the signing of mutually beneficial labor contracts, which would have important implications for the overall level and distribution of welfare. In addition, enforcement of these policies requires resources that could be used more directly for wealth creation.

## **STAKEHOLDERS AND THE POLITICAL ECONOMY OF REFORM**

It is clear that any type of reform is likely to have important distributional effects because of the differential impact on the welfare of various groups in society; some groups may benefit, while others will likely lose out. However, the losers and the winners will be specifically determined by the type of policy and the nature of the reform.

### **The minimum wage**

One important difference between reforms of the minimum wage and reforms of other labor market institutions is that the former mostly affect the bottom of the income distribution in contrast to, for example, changes

in the structure of unemployment benefits, which directly affect all workers. Indeed, the main winners from a rise in the minimum wage are those workers who thereby enjoy a wage increase. Meanwhile, the losers are those people who lose their formal jobs because of the related reduction in employment. Typically, both groups are *unskilled workers in the formal sector*. The opposite is true for a reduction in the minimum wage. Finally, the expectation is that the introduction of differentiated minima for groups or regions facing particularly high risks of unemployment will benefit workers from these groups or regions. In the case of the introduction of subminimal wages for selected groups, the policy may disadvantage other workers at the same level of productivity because employers would tend to replace more expensive workers with those at the subminimal wage.

In addition, *workers slightly above the minimum wage* are also likely to be (or to be afraid of being) affected by reforms because they risk being replaced by workers at the minimum wage. Indeed, they would benefit from a rise in the minimum wage if this reform results in the elimination of the least skilled (the employment effect) since it would increase their marginal value and hence their wages. On the other hand, they would suffer from a reduction in the minimum wage, since it might bring less-skilled workers into the market, and they might lose their jobs. Hence, semiskilled workers might support an increase in the minimum wage, although they do not benefit directly from such an increase.

*Workers in the informal sector* are also likely to be indirectly affected because the minimum wage may come to represent a “fair wage” and hence a binding constraint on employers in the informal sector who need to attract labor and minimize labor turnover. Some *employers* are likely to lose from reforms that increase the minimum wage, but the extent of the loss will partly also depend on their ability to elude the increase via an increase in shadow activity or other subtle methods to lower the effective hourly wage without violating the statutory minimum (for example, by extending working hours or reducing training schemes).

Reforms that decrease or increase the minimum wage are relatively simple to implement and have no direct *fiscal implications*. The administration of the minimum wage is also rather simple, and this limits the need for a sizable enforcement agency.

## Employment protection legislation

*Insider workers* hired under permanent contract in the covered sector are those for whom the bulk of employment protection legislation applies

directly. They are likely to suffer from radical reforms that soften the legislation since this might increase the chance they will lose their jobs. Thus, radical reductions in the scope of the legislation are generally difficult to implement because successful reforms typically need the approval of the median voter, who is likely to be an insider worker protected by the legislation. This might explain part of the resilience of job-security provisions and the difficulty of implementing radical reform once the institutions are in place. In such a context, marginal reforms seem to be the only politically viable option since they do not affect the median voter. A toughening of the legislation reduces the probability of exiting employment for those currently employed, but also increases the difficulty of finding a new job if one is lost. This produces a sense of insecurity among protected workers, who tend to exert pressure to maintain a high level of protection. Since protected workers tend to have greater political power than outsiders, they will typically oppose any diminution in the legislation.

The *outsiders*, on the other hand, include workers in the informal, uncovered sectors, the unemployed, and workers with fixed-term contracts. For them, a relaxing of the legislation usually has a positive impact in that it increases the hiring rate and, hence, the chance of these people to enter employment as insiders. However, these groups are unlikely to have sufficient political power to bring about the required reforms, and poorer, marginalized workers (youth, women, the unemployed, the discouraged) will tend to become more marginalized.

Finally, *capital owners and shareholders* are likely to benefit from a relaxing of the legislation, both marginal and structural, because strict legislation is akin to a tax on capital since it forces capital to be allocated to low-productivity jobs.

## Unemployment benefits

More generous unemployment benefit systems tend to redistribute from less exposed workers to more exposed workers and from the employed to the unemployed. However, the extent to which different groups will gain or lose depends on the strength of the various effects.

Under strong wage effects (when adjustments in the labor market occur through wage compression rather than through employment reduction), *insider workers* are more likely to suffer from reductions in benefits. Consequently, employed workers oppose reforms and may benefit from strong support from unions. Conversely, currently *unemployed individuals* may be more prone to accept benefit cuts because they may realize potential increases in job-finding rates. The progressivity of

unemployment benefits is also important. *Skilled workers* may support reductions in strongly progressive systems (or oppose the extension of progressive systems) since they do not benefit so much from these systems. For instance, they might oppose the introduction of a flat rate. Finally, when reforms have a strong active labor market policy content, both employed and unemployed individuals might be winners. Indeed, these policies increase the welfare of outsiders (by increasing expected job-finding rates), while reducing payroll taxes earmarked for unemployment benefits. They may also increase the wages of insiders. Overall, surveys in Europe eliciting the preferences of individuals for benefits (Boeri, Börsch-Supan, and Tabellini 2001) find that the demand for benefits is stronger among unemployed individuals than it is among all employees.

*Unions* often oppose reforms that reduce the generosity of benefit systems. This is partly because unions typically represent a relatively unskilled segment of the workforce and because unions are sometimes directly involved in the management of benefit systems.

### **The political economy of reform**

Since both intervention and the lack of it have the potential of leading to inefficient and inequitable outcomes, the desirability of labor market intervention depends crucially on the nature and characteristics of the policy. Some policies and intervention designs lead to improvements in efficiency and equity, while others result in a trade-off between the two dimensions, and still others represent a definite worsening in both dimensions. Consequently, it is not possible to evaluate the need for a reform and the potential impact of a reform on poverty and growth without a careful evaluation of the impact on labor market efficiency and income distribution.

Moreover, even in cases in which such an evaluation dictates a particular reform, the actual implementation of the change is never simple for reasons of political economy. This is because the reform is unlikely to be “Pareto neutral” due to its differential impact on the welfare of various groups in society; some groups will benefit, and others are likely to lose out. The magnitude and direction of these benefits and losses will depend crucially on the type of policy under revision and on the details of the reform.

One concern derives from the consideration that a government’s decisions on these and other matters may reflect more its overwhelming desire to be reelected rather than the objective of maximizing social welfare. This has two important negative implications. The first might be

called short-“termism,” whereby policies aiming at long-term social welfare gains that take more than one election cycle to become fully realized are less likely to be implemented than those aiming at a more immediate impact. An example of policies that risk being neglected would be a policy designed to match school education, skill training, and labor market employment.

On the other hand, governments will tend to favor policies that, while suboptimal in terms of welfare impact, may produce tangible gains, but generate costs that are so widely diffused that they are not perceived as costs or are so perceived only by groups or individuals who have little voice and limited political power. Examples of this type of intervention are provided by minimum wage legislation and employment protection legislation.

An example of a highly popular policy with insubstantial or negative welfare impact is the practice of subsidizing the purchase of shares in newly privatized companies. Meanwhile, depending on the prevailing political economy conditions, interventions that have great potential impact, such as improving information flows in the labor market, may be neglected by governments since the benefits are widely dispersed and unlikely to have an important influence on the popularity of the government.

A final rationale for the introduction of and support for interventions that are inefficient is provided by the theory of regulation. The analysis of Peltzman (1976) emphasizes that: (1) regulation confers benefits on certain market participants by providing subsidies or restricting competition; (2) in a static model, by doing this, regulation redistributes wealth toward particular groups; and (3) these groups try to retain or strengthen the regulation by providing political or financial support to sympathetic politicians. Excessively high levels of minimum wage or overly strict employment protection legislation provide good examples of policies that can be introduced and retained despite their potentially negative impact on social welfare.

## **IMPACT PATHWAYS**

Reforms of the labor market have important potential impacts on income distribution and poverty via their impacts on the level and distribution of wages and employment. On the whole, more binding and stricter policies result in higher wages for covered workers at the expense of employment in general and covered employment in particular. Thus, the overall effect of a reform depends on its combined effect on the demand and the

supply of labor in the covered sector and in other sectors of the economy. This effect differs across policies and labor market conditions. In any examination of key transmission mechanisms, it is crucial explicitly to consider the *dual* dimension of the economy and distinguish between the formal or covered sector, where the policies apply, and the informal or uncovered sector, where they either do not apply or are not enforced.<sup>12</sup>

### **The minimum wage**

The overall effects of changes in the minimum wage on income distribution and poverty depend on the characteristics of the labor market.

#### ***Effects on the level and the distribution of wages in the covered sector***

Minimum wage legislation involves establishing a floor for wages so that the equilibrium wage cannot drop below this floor. The expectation is that the introduction of minimum wage legislation or an increase in the minimum wage will, *ceteris paribus*, result in a compression in wage distribution and a reduction in wage inequality in the formal sector since it boosts the wages of the lowest-paid workers above the unregulated market equilibrium. Conversely, a reform designed to reduce the minimum wage across the board or among selected groups of workers is expected to increase earnings inequality.

However, evidence suggests that the effect of changes in the minimum wage are not limited only to workers at the lower end of the wage distribution. Indeed, a rise in the minimum wage may lead to a shift in the wage distribution and an increase in average wages, and part of this increase may be enjoyed by workers with earnings higher than the minimum wage. If this is the case, any reduction in wage inequality may be considerably less than anticipated.

#### ***Effects on the level of employment in the covered sector***

In a perfectly competitive labor market, the imposition of a minimum wage above the equilibrium wage—or an increase in the value of the minimum wage—would generally reduce employment through a reduction in labor demand along an upward-sloping labor supply. Workers whose marginal value product is below the minimum wage are forced out of employment; classical unemployment arises and can only be reabsorbed by lowering the minimum wage. If, in addition, the increase in the minimum wage results in an overall increase in wages, the reform will lead to a generalized reduction in employment across the earnings distribution. The extent of this reduction and the overall change in labor incomes

received by workers in the covered sector depend on the elasticity of labor demand (at constant output). Across the world, this typically varies between  $-0.15$  and  $-0.75$ , with an average of  $-0.45$  (Hamermesh 1993).

On the other hand, if a labor market or any of its segments are dominated by a single employer, the monopsonist, then the impact of an increase in the minimum wage may be very different. The reason for this conclusion is that the monopsonist can affect the equilibrium wage by deciding on the volume of hiring. If labor supply grows with wages, the monopsonist will have an incentive to restrict hiring in order to benefit from low wages. In this context, a rise in the minimum wage is perfectly consistent with a rise in employment. Thus, for a sufficiently low level of starting wage, an increase in the minimum wage could be accompanied by an increase in employment. However, above some specific threshold, the traditional negative relationship sets in. This result is very important. However, three caveats are in order:

- Pure monopsony situations are very uncommon; they may occur in specific geographic areas where labor mobility is low and the number of firms is small.
- An increase in the minimum wage acts positively on employment only when the initial level of wages is low (below the competitive wage); this is not common in most real-life markets.
- The impact on employment of a rise in the minimum wage depends on the elasticity of labor supply; labor supply has little elasticity on average.

Over the last 10 years, a number of papers have studied various imperfect models in which an upward-sloping supply curve at the firm level may arise, implying that the basic monopsony model may become relevant. When imperfect information is pervasive, workers may have an interest in refusing job offers when the wage is too low, since they may get better offers later on. A firm must then choose a wage level that will allow it to attract a sufficient number of workers to meet its needs (Burdett and Mortensen 1998; Masters 1999). This mechanism ensures a monotonic relationship between the wage and the size of firms. Other scholars have proposed variants of the monopsony model grounded in the theory of “efficiency wages.” Manning (2004) summarizes and reviews this research in detail.

The introduction of a subminimal wage among categories of workers characterized by particularly low average productivity (youth) or a high variation in productivity levels (women) has an impact on these

workers that is equivalent to that of a generalized reduction in the minimum wage, that is, it will increase employment among them unless the monopsonist model applies. However, the increase in employment among these workers may be achieved at the expense of a reduction in employment among other workers, and the overall effect on aggregate employment is uncertain.

It appears that no systematic evaluation of the impact of reductions in the minimum wage exists. However, experimental evidence suggests that the effects of changes in opposing directions in the minimum wage are not symmetrical and that the positive effect of a reduction in the minimum wage on employment may be much smaller than the negative effect of an increase of equal proportion in the minimum wage. This is because the existence of the minimum wage results in a permanent increase in reservation wages that does not fully adjust downward when the level of the minimum wage is reduced (Falk, Fehr, and Zehnder 2005).

### ***The impact on wages and employment in the uncovered sector***

In most developing countries, there is a substantial informal sector, and, in large pockets of the formal sector, minimum wage legislation is not applied. This does not mean that these sectors are unaffected by minimum wage reforms since there are important spillover effects between the two sectors. The standard theoretical argument is that, following an increase in the minimum wage, sector wages that are not covered will fall because redundant workers will move into employment in the uncovered sector, and employment in this sector will rise (Gramlich 1976; Mincer 1976; Welch 1976).<sup>13</sup> However, if an increase in the minimum wage in the formal sector leads firms in the informal sector to raise their average wage to keep attracting good workers or because of “fair remuneration considerations,” an increase in the minimum wage can lead to an increase in informal sector wages (the lighthouse effect) or a drop in employment.

### ***The effect on participation, job-seeking, and unemployment***

In the context of a labor market that is supply constrained, the expected impact of the minimum wage may be somewhat different given the existence of endogenous labor market participation and endogenous search effort on the part of the unemployed. One can think of the decision to participate in the labor market as the solution to the trade-off between the value of being an unemployed job-seeker and the value of being engaged full time in home production. In this situation, the increase in the potential benefits of employment generated by the increase in the minimum wage may lead to an increase in labor force participation and

a shift in labor supply that increases employment among the low paid. In addition, if the new minimum wage exceeds the reservation wage, the intensity of the job search by the unemployed and their exit rate from unemployment may rise. Thus, the supply-side effects of the introduction of a new, higher minimum wage may combine to increase employment and reduce unemployment.

### ***The effect of minimum wage reforms on income distribution and poverty***

In evaluating the potential impact of minimum wage reforms on income distribution, it is important to distinguish between earnings distribution and income distribution. The former is defined at the level of the individual and by focusing only on employed workers. The latter is usually defined at the level of households and is calculated according to the total labor income of all household members, plus income from other sources.

An increase in the minimum wage can have both a positive and a negative effect on inequality in household incomes. First, a rise in incomes at the lower end of the income range among the formally employed typically reduces inequality in individual earnings. However, it might also result in less employment among the low-paid workers for whom the minimum wage is binding or in the transfer of some of these workers to the uncovered, less-well-paid informal sector. This could increase inequality in labor incomes both at the individual level and at the household level, especially if workers on the minimum wage live in households with a high proportion of low-skilled, potentially low-paid individuals. The overall direct effect on income inequality depends on labor market conditions, demographics, and household composition.

These effects are compounded by the indirect changes in the sector not covered. If labor is mobile across sectors, then the standard covered-uncovered adjustment mechanisms operate, and an increase in the minimum wage leads to an increase in earnings inequality. Yet, the impact is reduced if the lighthouse effect comes into play, since a higher minimum wage leads to an increase in wages in both the covered market and the uncovered market. In this case, the overall impact on the distribution of household income will depend on the employment dynamics between the covered sector and the uncovered sector, as well as the impact of the reform on the two segments of the labor market.

Reforms of the minimum wage are also expected to have a typically ambiguous impact on the *poverty rate*.<sup>14</sup> An increase in the minimum wage, for example, will typically raise the earnings of low-paid workers who maintain their jobs, and, *ceteris paribus*, this will bring the poverty rate down if these individuals are the lone earners within their households

and if all low-paid earners within households maintain their employment at the prereform level. However, the increase is also likely to reduce employment in the covered sector, and this will result in lower labor income at the household level if any wage earners lose their jobs because of the policy or are forced to transfer to the lower-paying, uncovered sector. This may increase the vulnerability to poverty of households that are close to the poverty line (Brown 1999). However, evidence in developed countries suggests that a large proportion of earners on the minimum wage are second or third earners in households that are well above the poverty line. This substantially reduces the potential impact of minimum wage reforms on the incidence of poverty.

### **Employment protection legislation**

There are four transmission mechanisms through which reforms in employment protection legislation can affect the distribution of incomes and the incidence of poverty.

#### ***Impact of reforms on hiring, firing, and employment levels***

Hiring and, especially, firing are the key standard mechanisms of any reform in employment protection legislation because such legislation tends to increase the cost to firms of initiating a worker separation. Thus, the most direct effect of legislative reform is a change in the rate of firings since the reform affects the tendency of firms to hoard labor—to hold onto marginal jobs—and delay the timing of labor adjustments. However, legislative reform also has an obvious indirect effect on hiring because firms, at the hiring stage, will attempt to anticipate future costly adjustments because of adverse shocks. Strict legislation will therefore reduce the incentive for firms to hire additional workers. The combination of direct and indirect effects suggests that strict legislation will reduce turnover (hiring and firing), while any reform that reduces the stringency of the legislation will lead to an increase in turnover among firms. The effects on the stock of employment are more ambiguous. In equilibrium, hiring and firing among firms offset each other. In this case, the existence of legislation has no clear effect on the average employment level. The key transmission mechanism of employment protection legislation does not imply a reduction in average employment, but rather an effect on the flows of employment.<sup>15</sup>

The transmission mechanism described above can be easily applied to the case of radical reforms, but, when reforms are marginal, the situation is more complicated. This is illustrated by a reform that increases the

availability of fixed-term contracts, a typical marginal reform in OECD countries during the 1990s.<sup>16</sup> The availability of temporary contracts will certainly raise the incentive for firms to hire new workers on a temporary basis. In addition, it will increase the incentive for firms to wait until the expiration of temporary contracts before implementing reductions in personnel. This suggests that a marginal reform in the labor market can lead to the formation of a dual labor market, wherein a stock of protected workers hired under a complete legislative regime of employment protection exists alongside a fringe of workers hired under temporary contracts, and that this dual labor market acts as a buffer against labor market shocks (Blanchard and Landier 2002).

The workings of the key transmission mechanism depend crucially on the behavior of wages and on the use of taxes versus transfers. The baseline transmission mechanism functions smoothly if wages do not adjust in response to changes in employment protection legislation and if a reform relates to a tax component of the legislation. The situation becomes more complicated if wages can adjust, especially in the case of legislation involving transfers.

### ***Wage-bargaining***

Another important transmission mechanism involves the effect of employment protection legislation on the *threat point* of wage-bargaining for insider workers. The existence of such legislation reduces a firm's threat point in the bargaining over the wages of insiders because insiders are protected by the legislation against dismissal in case a wage agreement is not reached. As a result, the existence of the legislation leads to higher wages for insider workers.

The key issue is what happens to the wages of outsiders. Most wage-bargaining models predict the emergence of a two-tier regime, whereby the wages of outsiders are reduced because of the legislation. In other words, workers on temporary contracts partly prepay, in the form of lower wages, the future cost of employment protection legislation. The size of the prepayment will depend on whether the legislation provides for a firing tax or a severance payment.

In the case of severance payments, the prepayment is full, so that the expected cumulative wage bill obtained by hiring an outsider is constant. This is the well-known neutrality result of the existence of severance payments and wage flexibility, originally identified by Lazear (1990). It is an important benchmark result, since it suggests that, when employment protection legislation takes the form of a transfer and wages are sufficiently flexible, the legislation is neutral. In the case of firing taxes, the

prepayment is never full, so that the predictions obtained by the standard mechanism apply. To sum up this transmission mechanism: employment protection legislation induces a reduction in the wages of outsiders and an increase in the wages of insiders. In addition, when the legislation provides for a transfer, the effect of wage-bargaining is so important that the legislation is neutralized. The neutrality disappears, however, as soon as wages become rigid or if the legislation provides for a tax rather than a transfer.<sup>17</sup>

### ***The effort of workers and labor productivity***

Another transmission mechanism revolves around the impact of employment protection legislation on worker productivity. Since such legislation increases job security, it automatically reduces the incentive of workers to make any extra effort and, thus, in turn, reduces labor productivity. While it is true that an increase in job security can certainly lead to an increase in the propensity of workers to shirk, one needs to bear in mind the difference between economic dismissal and disciplinary dismissal; legislative provisions typically govern only economic dismissals, that is, dismissals that are not caused by a shortcoming of the workers (Ichino and Riphahn 2005). If a clear distinction exists between economic and disciplinary dismissals, the potential for an increase in shirking is substantially reduced. In addition, many have argued that the greater job tenure that derives from employment protection legislation may in fact foster an increase in productivity via the higher incidence of job-specific training and greater company loyalty among workers.

### ***Capital-labor substitution and capital allocation***

Employment protection legislation may also have an impact on the prevailing technology. This mechanism was originally discussed by Caballero and Hammour (1998), and it is best understood from the perspective of a sort of putty-clay technology.<sup>18</sup> In the short run, capital is largely fixed and installed, and capital-labor substitution is low. In the long run, however, firms have a much more flexible technological menu at their disposal and can select different capital-labor ratios. This suggests that more encompassing employment protection legislation may have different effects in the short and long run. In the short run, an increase in legislative coverage may result in a tax on existing capital in ways that cause a greater share of the surplus to be captured by labor. The situation is different in the long run. Since employment protection legislation acts partly as a tax on labor, firms have an incentive to invest in labor-saving technologies, leading to an increase in the capital-labor ratio.

Finally, the passage of stricter legislation tends to reduce the reallocation of capital from ailing sectors to expanding sectors. In a sense, this is in the nature of a sclerotic market; it suggests that, in a country with strict legislation, capital is not allocated efficiently. This may have an obvious impact on the average productivity of the economy and may also affect the growth process.

## **Unemployment benefits**

Reforms of the system of unemployment benefits can impact labor market outcomes through various channels.

### ***Impact on unemployment duration and incentives for job-seeking***

Generous, long-term benefit entitlements may provide an incentive for longer spells of unemployment; cross-country evidence demonstrates the existence of this positive association (Boeri, Layard, and Nickell 2001). Thus, a reduction in unemployment benefits is advocated as a way of reducing the duration of spells of unemployment. However, some studies suggest that causality might work the other way: in cases of high long-term unemployment, governments might be pressed to increase the duration of benefits. For instance, changes in the duration of unemployment benefits in some parts of the United States tend to follow upon increases in the duration of unemployment (Card and Levine 2000). This means that the negative effects of benefits on the duration of unemployment may be overstated.

Thus, most benefit systems are designed to discourage recipients from using the system for the maximum duration. For instance, unemployment insurance benefits typically decrease in value over time, and there may be limits on the maximum duration of unemployment assistance benefits or conditions may be imposed in terms of the time or effort spent job-seeking. New policies also provide incentives to increase search efforts by imposing restrictions and conditions on the receipt of unemployment benefits. Finally, assistance in job-seeking is often provided to encourage more active searches. On the other hand, eligibility for unemployment assistance that is based on means-testing at the household level can create strong incentives for other members of the household to leave employment or limit their searches (because their incomes may increase the average household income above the eligibility income threshold).

Reforms reducing the generosity of unemployment benefits (or raising the rewards of labor market participation) provide incentives for the unemployed to increase the intensity of their job searches. Furthermore,

evidence supports the positive effect on employment and on earnings of the provision of assistance in job hunting. Evidence also points to the cost savings arising from the increased flows of people from unemployment to employment generated by the imposition of job-seeking requirements. Finally, penalties on individuals refusing to take up suitable job offers seem to be rather effective in a few selected countries (the Netherlands for example).

### ***Impact on the level and type of employment***

The implementation of an increase in wage subsidies through variable contribution rates among employers for different types of workers may also affect employment and wages, depending on the elasticity of labor demand and supply.<sup>19</sup> A reduction by 21 percent in employer contributions in Belgium for the wages of unskilled workers is expected to increase employment among low-skilled workers by almost 7 percent. Estimates for France and the Netherlands point to similar increases.<sup>20</sup>

Linking benefits to past contributions reduces the incentive to evade payroll contributions and provides an incentive for workers to stay in the formal sector. Since these workers would likely require a higher wage in the informal sector, this also provides an incentive to firms to remain active in the formal sector to avoid paying higher wages.

## **TOOLS OF ANALYSIS AND THE FINDINGS**

Natural experiment is the best empirical methodology for assessing the distributional effects of labor market reforms. This methodology consists of exploiting exogenous changes in the economic environment of certain agents to compare their reactions to those of otherwise similar agents who have not undergone the changes. The influential work of Card and Krueger (1994) on the effect of the minimum wage represents a key illustration of this methodology. However, the opportunity for carrying out studies based on this technique is rarely at hand, and, for the most part, researchers have to find other ways of assessing the impact of labor market reforms.

Computable general equilibrium models can also be useful, but they have to depend on an underlying structure of the labor market in a way that is consistent with the complex effects of the regulation in question. There are two key features that should be kept in mind, particularly if one is dealing with a complex dual labor market in a developing country. First, the analyst should pay special attention during the modeling of both the formal-covered sector and the informal-uncovered sector of the

economy. Second, a model based on a simple two-sector conception of perfect competition is hardly appropriate for assessing the effects of reforms that may have considerably different impacts under different labor market conditions, say, the impact of a reform of the minimum wage in a context of monopsonistic price setting. The literature does not yet seem to provide a good example of complex labor markets that could be used as reference points.

For the most part, the empirical literature focuses on

- evaluating the impact on one particular link in the chain of reactions described above (that is, employment or the wage level), without much consideration of the transmission channels of the impact (that is, the full distributional impact)
- the impact of the implementation of a particular policy rather than the potential effects of reforms in the current system

The review that has been undertaken of methodologies and findings for this chapter covers the existing evidence and treats the implementation or removal of a policy as a type of reform that causes a labor market to become more regulated or less regulated. The findings on each of the transmission channels and on the overall impact on income distribution and poverty are summarized below.

## **Minimum wage**

Over the last 10 years, an extensive amount of research on the employment effect of the minimum wage has emerged, mainly in response to the results of the empirical studies carried out by Card and Krueger (1995). Furthermore, the growing availability of microdata for developing countries has permitted a deepening understanding of the minimum wage in dual markets. Most of the empirical literature analyzes total employment from the perspective of the effects of the introduction of or increase in the minimum wage. Some also focuses on the impact of changes in the subminimal wage on the employment of youth. On the basis of the available evidence, it is not clear that an increase in the minimum wage leads, on average, to substantial job losses. However, the increase may contribute to a shift from formal to informal employment.<sup>21</sup>

### ***Effects on the level of employment***

Card and Krueger (1994, 1995) studied the impact of increases in the minimum wage in New Jersey in 1992 and in California in 1988, taking

Pennsylvania, a state where the minimum wage did not change, as a control. Using a difference-in-difference estimator, they found that, after the minimum wage was raised from \$4.25 to \$5.05 in New Jersey, the level of employment in fast-food establishments rose more quickly in New Jersey than it did in Pennsylvania. They concluded that an increase in the minimum wage may lead to a rise in employment if the wage is sufficiently low at the outset, as it was in New Jersey. (In the literature on development, no evidence derived from natural experiments has been discovered on changes in the minimum wage.)

The research by Card and Krueger generated a vivid debate along two dimensions. The first dimension was the interpretation of the results, for example, whether consumers of fast food can be considered representative of the population as a whole, since it may well be that persons earning minimum wages are typical consumers of fast food. The second dimension of the debate revolved around the fact that the original Card and Krueger study was based on data gathered through telephone interviews and not on administrative data. However, despite the arguments and counterarguments exchanged between Neumark and Wascher (2000) and Card and Krueger (1994), the results of the earlier study seem to have been confirmed.

In the absence of access to the natural experiment methodology, the large majority of empirical studies adopt a methodology that consists of highlighting the aggregate correlation between variations in employment and the minimum wage, while controlling for the other factors that might affect employment. These studies make use of the evolution over time of the minimum wage, as well as differences in the level of the minimum wage across industries and geographic regions. The estimates vary from country to country. Large negative effects are found in Colombia (Bell 1997), Ghana (Jones 1998), Morocco (Agenor and El Aynaoui 2003), and Puerto Rico (Castillo-Freeman and Freeman 1992), while the impact appears to be insignificant in Indonesia and Mexico (Bell 1997; Rama 1996). Carneiro (2004) also finds evidence of a significant reduction in formal sector employment and a shift toward employment in the low-paying informal sector. It is clear that, in this type of study, too many variables are often left out of the analysis, and the coefficients should not be interpreted as robust evidence, but simply as important country-specific correlations.

*Data at the level of firms* are becoming available in developing countries and are often used to estimate the impact of the minimum wage on labor demand. Studies typically use these data on the formal manufacturing sector and regress employment at the level of firms on a set of con-

trols (such as the prices for other factors and value added, if available), a minimum wage dummy, and employment lags to allow for dynamic adjustment.<sup>22</sup> The estimates of the impact vary across countries. The effect of the minimum wage appears large and negative in Colombia (Bell 1997; Maloney and Mendez 2003), but small or negligible in Costa Rica and Mexico. In Indonesia, the sharp increase in the minimum wage registered between 1990 and 1996 appears to have reduced employment in small domestic firms, but not in larger ones, foreign or domestic. Meanwhile, the impact on total employment was found to be positive in Brazil, but was the result of a composition effect between hours and jobs; the total number of hours increased, but the number of jobs fell.

Estimates of the impact also vary across *groups of workers*. The job losses resulting from an increase in the minimum wage in Brazil and Mexico seem to have particularly affected marginal groups such as women, youth, and low-skilled workers. It is supposed that this impact depends on the level of the minimum wage relative to the wages of these groups (World Bank 2006). In Chile, an increase in the minimum wage appears to have reduced employment opportunities among youth and the unskilled and, thus, especially unskilled youth, while promoting the employment of skilled and older workers (Montenegro and Pagés 2003). The minimum wage also appears to be responsible for much of the increase in long-term unemployment among the unskilled population in Bulgaria and Lithuania (Rutkowski 2003a, 2003b). Similarly, experience in Mexico suggests that the erosion of the minimum wage in the 1990s boosted employment among women (Feliciano 1998). Some countries also experimented with subminimal wages for apprenticeship, which seems to have improved employment opportunities for young graduates in Chile (Gill, Montenegro, and Domeland 2002).

While most of these studies use data on the formal sector, there are at least three studies that use the same methodology to look at the employment effects of changes in the minimum wage in the *informal sector* (Lemos 2004a for Brazil; Gindling and Terrell 2004a for Costa Rica; Jones 1998 for Ghana). Using microdata for Brazil, Lemos finds evidence of adverse employment effects in both the formal sector and the informal sector, challenging standard two-sector models. Her results are consistent with a sizable lighthouse effect. Similar effects are also found by Gindling and Terrell for Costa Rica who, perhaps surprisingly, also discovered evidence that the minimum wage compresses wage distribution in the informal sector more than in the formal sector. Yet, no wage effect of the minimum wage was found for the self-employed. In contrast, Jones (1998) found that the effects of the minimum wage in the informal sector

in Ghana appear consistent with the standard mechanism of the traditional two-sector model.

*Individual longitudinal data* make it possible to follow the labor market histories of persons whose wages are at or close to the minimum wage. Recent studies in this area find that changes in the minimum wage have a significant impact on employment among these workers. Nevertheless, there is no agreement over the direction of these changes. Abowd et al. (1999) found that, in France, an increase of 1 percent in the minimum wage reduces the employment probability of workers on minimum wage by 1.3 percent among men and 1.0 percent among women. In the United States, a reduction by 1 percent in the minimum wage increases the employment probability of affected workers by 0.4 percent among men and 1.6 percent among women. Portugal and Cardoso (2001) found different results using the same type of methodology. They exploited legislative changes in the minimum wage in Portugal in 1987. The minimum wage was raised by 50 percent for adolescents aged 16 to 18 and 33 percent for youths 18 and 19. They found that the hikes had a dampening effect on hiring, but that those young people who found jobs had a greater tendency to keep them. In other words, Portugal and Cardoso observed fewer departures from employment, and this partly offset the fall in hiring.<sup>23</sup> Using longitudinal data from three contrasting individual data sets, Stewart (2004) found that the introduction of the minimum wage in the United Kingdom had an insignificant effect on the employment probability of low-wage workers.<sup>24</sup> Indeed, overall, the minimum wage appeared to have potentially significant effects on the probability of being hired or of losing a job. However, it does not invariably have a positive effect on the probability of job loss among the population affected by the minimum wage.

### ***Effects on the wage level, the average wage, and wage distribution***

Empirical evidence suggests that the introduction of or increase in the minimum wage has considerable spillover effects on the level of wages of workers further up the earning distribution. For instance, studies in Brazil, Colombia, and Mexico show that a 10 percent increase in the minimum wage results in a 1–6 percent increase in average wages (World Bank 2006). This appears to be caused by the fact that the minimum wage seems to be used as a more general unit of account or “numeraire,” for instance in quoting wages or monetary contracts in general, and, hence, the minimum wage influences wages throughout the earnings distribution. For example, in Bolivia, the effects of a change in the minimum wage have echoed up the wage distribution; 60 percent of the rise has

been transferred to wages around the minimum wage, and 38 percent to wages around four times the minimum wage (Maloney and Mendez 2003). In Indonesia, a doubling of the minimum wage led to an estimated 10 percent increase in average wages (Rama 1996).

However, empirical evidence from Latin America suggests that some groups of workers benefit disproportionately from increases in the minimum wage and that this has important distributional implications. For example, analyses in Brazil and Mexico suggest that minimum wage increases benefit men more than women throughout the wage distribution. A 10 percent increase in the Mexican minimum wage led to a 10–36 percent increase in men’s wages, but only to a 0–10 percent increase for women (World Bank 2006). Similarly, in Mexico, adults with wages around the minimum wage are found to benefit more from minimum wage increases than do the young in the same earnings category.

The minimum wage appears also to operate somewhat in the informal sector in many countries of Latin America, including Brazil, Chile, Colombia, Ecuador, El Salvador, Guyana, Mexico, Nicaragua, Panama, Paraguay, Peru, Venezuela, and Uruguay (World Bank 2006). In Brazil, there is evidence that the minimum wage has a strong influence on the informal labor market and acts as a “voluntary” reference wage. Over 20 percent of wage adjustments in the informal sector were exactly equal to the minimum wage adjustment after the launching of the Real Plan, September 1994 to May 1995 (Amadeo, Gill, and Neri 2002). In Costa Rica, the minimum wage compresses the wage distribution in the informal sector more than in the formal sector, but does not have wage effects among the self-employed (Gindling and Terrell 2004a). Similarly, there does not seem to be evidence of a strong lighthouse effect among the self-employed in Bolivia; this might be related to the fact that the self-employed may adjust their earnings frequently to avoid inflation erosion (Maloney and Mendez 2003).

### ***The effect of minimum wage reforms on income distribution and poverty***

One way of assessing whether the minimum wage is actually enforced is to plot the earnings of individuals as a histogram. The position and shape of the histogram provide information on the extent of compliance with the minimum wage. If there had been no government intervention in the labor market, one would expect the wage distribution to be relatively smooth, reflecting the underlying distribution of skills among workers. On the other hand, if employers actually enforce the minimum wage, workers who would have earned less than the minimum are no longer employed, and the distribution is truncated. The fact that some workers

have lost their jobs should create a spike in the wage distribution that is relatively close to the legally imposed minimum. If there is no spike or if the spike lies significantly to the right or the left of the minimum wage, the data indicate that the minimum wage is having little “bite.” This empirical methodology is often used to provide a first assessment of the impact of a minimum wage. Most studies on developing countries *find evidence of a spike* in the wage distribution that corresponds to the minimum wage. This is a first, visual effect of the ability of the minimum wage to compress the earnings distribution. This effect appears to occur in most developing countries in Latin America and in some transition economies.<sup>25</sup>

Particularly interesting is the search for a wage spike in the informal sector. Since the minimum wage is not binding in that sector, one would expect to find no spike, but, if the lighthouse effect is relevant, one may find a spike in the wage distribution also in the informal sector. The lighthouse effect is precisely what Lemos (2004a) finds in her study of the impact of the minimum wage in the formal and informal sectors of the Brazilian economy. Similar results have also been found in other Latin American countries (World Bank 2006).

The overall impact of a reform on earnings inequality seems to depend on the initial level of the minimum wage. In Latin America, increases in a high minimum wage have been found to boost inequality, while increases in a relatively low minimum wage reduce inequality (World Bank 2006). The decrease in the real minimum wage in Brazil and Mexico in the 1990s has been blamed for a large share of the increase in overall inequality. Thus, the decrease was responsible for 4.8 percent of the increase in inequality in the formal sector and 18.4 percent in the informal sector in Brazil (Rodrigues and Menezes-Filho 2004). Similarly, a study of 121 countries over the period 1970–2000 shows that the minimum wage (relative to per capita income) tends to worsen income inequality (Calderón, Chong, and Valdés 2004).

On the other hand, empirical research in the United States generally concludes that the minimum wage reduces wage inequality (Brown 1999) and that an increase in the minimum wage also reduces wage inequality. DiNardo, Fortin, and Lemieux (1996) and Lee (1999) suggest that the fall in the real value of the minimum wage contributed significantly to rising wage inequality in the United States in the 1980s. DiNardo, Fortin, and Lemieux (1996) look at the evolution of the distribution of wages between 1979 and 1988 and find that the fall in the minimum wage explains one-quarter of the rise in the standard deviation in the distribution of men’s wages and 30 percent of the standard deviation for women. Lee (1999), for his part, estimates that the shrinking minimum wage over this period

explains 70 percent of the increase in the ratio of average fifth-decile wages to average first-decile wages.

Evidence from the United States suggests that the net effect of a minimum wage increase on *poverty* is very small; only 4.1 percent of the group was lifted out of poverty, while 3.9 percent of the previously non-poor fell into poverty as a result of the policy (Neumark and Wascher 1997). One possible explanation lies in the fact that earners of the minimum wage are typically distributed across the broader population (including in middle-income households) rather than only in low-income households. Hence, some of those who lose their jobs might live in households that have other substantial sources of income that can help maintain the newly unemployed individuals within the non-poor household. Similar results have also been obtained through a simulation exercise in the United Kingdom that used data from the family-expenditure survey and Polimod, a tax-benefit microsimulation model (Sutherland 2001). Findings from this simulation suggest that the minimum wage is not an efficient method for targeting poverty in the United Kingdom because it benefits the same proportions of the poor and the non-poor. In addition, poverty rates appear not to be very sensitive to the level of the minimum wage, and the introduction of the minimum wage appears to have only a small impact on the overall poverty rate, a potential reduction of only 1.2 percent.

For the minimum wage to have a significant impact on poverty, it needs to be higher than the subsistence minimum for wage earners and their dependents. However, the minimum wage provides for the basic needs of one worker, plus one dependent in only 7 of the 17 countries in a study on Latin America and the Caribbean (World Bank 2006). A look at both the increased wages among those household members who kept their jobs and the fall in earnings among those who lost theirs reveals that the increase in the minimum wage had some impact on wage poverty rates in Colombia, but not in Brazil (Arango and Pachon 2003). A disaggregation among the poor, who represent a large share of the population in these countries, shows, however, that the poorest do not benefit. Rather, the main beneficiaries are households near the poverty line. The poorest 25 percent in Colombia are not helped at all, which might be because the wage and unemployment effects cancel each other out or because the minimum wage laws do not have effects on this part of the population. In Brazil, the bottom 30 percent of the income distribution actually experiences wage losses, while poor households in higher brackets do not benefit. These results are confirmed by Carneiro (2004), who suggests that the shift of employment from the formal sector to the informal sector following the increases in the minimum wage in Brazil from 1982 to 2002

was largely responsible for the rise in poverty over that period. Similarly, evidence from Indonesia suggests that increases in the minimum wage may have worsened the poverty situation there (Mason and Baptist 1996).

In contrast, an analysis in four African, five Asian, and thirteen Latin American countries shows that the minimum wage does reduce poverty as measured by headcount, the poverty gap, or calorie intake. These effects are similar in the various regions, though they are more marked for urban poverty relative to rural poverty. However, since the minimum wage is also associated with higher unemployment, the reduction in poverty may be offset by losses in efficiency over the long term (Lustig and McLeod 1996).

### **Employment protection legislation**

Assessing the impact of a specific reform in employment protection legislation is not easy. In the absence of evaluations using natural experiments, most empirical regularities are revealed through cross-country comparisons rather than through full-fledged policy evaluation. Researchers have used statistical methods to compare the effects of a reform on treatment groups of workers, as well as control groups. This is always done using microdata on firms and workers. A good example is the work of Kugler (2000, 2004) on the Colombian reform. The identification strategy of this type of analysis consists of exploiting the change over time in labor market legislation, together with the variability in coverage across groups. While such studies broadly confirm the empirical regularities, they provide much sounder economic analyses. Another example of this type of study is Acemoglu and Angrist (2001).

### ***Effect on employment levels***

According to the theoretical wisdom, the overall effect of employment protection legislation on employment should be limited. Indeed, stricter legislation is expected to reduce labor turnover, which would translate into higher employment rates during periods of recession (since firms cannot adjust their labor force downward) and lower employment rates during periods of expansion (since firms do not adjust for fear of subsequent recessions). Hence, the net impact of reforms is likely to vary according to economic cycles.

Evidence from cross-country time-series data on OECD countries tends to find that stricter employment protection legislation has either a negative or an insignificant impact on employment. Similarly, the effect on unemployment is ambiguous. However, evidence based on disaggre-

gated data for single countries, which permit the capture of more variations in regulatory policies, suggests that job-security regulations have a negative effect on employment.<sup>26</sup>

In Peru, the use of severance payments is found to have a negative effect on the level of employment, and labor demand appears to adjust more slowly to economic cycles. Between 1987 and 1990, a 10 percent increase in dismissal costs reduced long-run employment rates by an estimated 11 percent, keeping wages constant (Saavedra and Torero 2000, 2003). Evidence from Argentina also points to a negative relationship between employment protection legislation and employment, with a 10 percent increase in dismissal costs, leading to a 3 to 6 percent decrease in employment rates (Mondino and Montoya 2003). Overall, the country-specific evidence from Latin America consistently points to a negative impact on average employment rates by employment protection legislation, although a cross-sectional analysis of time-series data on a pool of countries does not yield robust results (Heckman and Pagés 2003). Similarly, in South Africa, 39 percent of large manufacturing firms reacted to stricter legislation by reducing the level of hiring or substituting capital for workers, which suggests that the legislation had a negative impact on employment levels.<sup>27</sup> An equally strong negative relation emerges in Croatia, where excessive legislative controls have been identified as the only major reason for high levels of unemployment (Rutkowski 2003c).

In the longer term, legislation may have an impact on the type of technology that firms select. An increase in legislative controls could, in the long run, lead firms to invest in labor-saving technologies, thereby raising the capital-labor ratio and lowering employment. This phenomenon seems to be confirmed by a comparison of France and the United States in the 1980s and 1990s (Caballero and Hammour 1998). Capital-labor ratios are larger in France than they are in the United States, and the evolution of profit shares is consistent with this finding (Blanchard 1997). The evidence from South Africa presented in Table 3.3 also points to substitution, with 39 percent of large manufacturing firms responding to stricter legislation by replacing workers by capital.

### ***Effects on employment flows***

Overall, radical reforms in employment protection legislation affect the cost for firms of the worker separations the firm may initiate. A first direct effect is that strict legislation pushes the firms to hold on to marginal jobs and delay labor adjustment (that is, they hoard labor). Stricter legislation also leads firms to anticipate more costly labor adjustments in the future

**TABLE 3.3. Cumulative Employment Response of Firms in the Greater Johannesburg Metropolitan Area to the Stricter Labor Policies of 1995–9, 1999***percentage share of firms*

	<i>Large manufacturing</i>	<i>Large tourism</i>	<i>Large information technology</i>
Hire fewer workers	39.2	25.9	7.0
Substitute capital machinery for workers	38.9	7.3	14.0
Hire more temporary than permanent workers	41.6	27.9	14.0
Rely more on subcontracting	33.5	27.8	19.0
Improve labor relations	29.6	26.0	9.0
Increase labor productivity	11.9	18.7	—

*Source:* Chandra and Nganou 2001.

in response to adverse shocks, which reduces their incentive and propensity to hire. This suggests that stricter legislation reduces turnover (hiring and firing) within firms and increases the duration of unemployment. As a result, any reform that reduces the stringency of employment protection legislation should induce an increase in turnover within firms. This assessment is strongly supported by empirical studies in OECD countries. For instance, Scarpetta (1996) finds that the effect of strict legislation is more severe on long-term unemployment than on average unemployment.

The reduction in the costs of firing in Peru since 1991 through fewer job-security regulations, the introduction of temporary contracts, and changes in the severance payment regime has led to a growth in turnover, especially in the formal sector, among blue-collar workers and temporary workers (Saavedra and Torero 2000, 2003). Similarly, the introduction of fixed-term contracts and employment trial periods in Argentina led to a sharp increase in labor turnover, increasing hazard rates during trial periods by 40 percent, without an offsetting decrease in long-term employment (Hopenhayn 2001).<sup>28</sup> In Colombia, a loosening of regulations in 1990 increased the dynamism of the labor market by raising entry and exit rates into and out of unemployment, especially in the formal sector and among large firms (Kugler 2000).

### ***Effects on types of employment***

Marginal reforms can have an impact on types of employment. For instance, a reform in employment protection legislation that increases the availability of fixed-term contracts will increase the incentive for firms

to hire new workers on temporary contracts and wait to lay off employees until the expiration of temporary contracts. Hence, such marginal reforms can lead to the establishment of a dual labor market wherein a stock of protected workers hired under a full employment protection regime is accompanied by a fringe of flexible workers hired on temporary contracts. These temporary contracts thus act as a sort of buffer to shocks in the output market (Blanchard and Landier 2002).

The use of temporary contracts varies across countries, but it is substantial in some cases. For instance, in Spain, the share of workers hired on temporary contracts is now as high as 30 percent (Dolado, García-Serrano, and Jimeno 2002). The share of temporary contracts in formal salaried employment in Lima rose from under 20 percent in 1991 to 44 percent in 1997 after the red tape and restrictions on temporary contracts were reduced (Saavedra and Torero 2000). In Argentina, the rise in hiring on temporary contracts was associated with a substitution away from longer-term employment (Hopenhayn 2001). In Colombia, growing employment turnover following a relaxation of employment protection legislation resulted in greater reliance on temporary contracts, as well as less job security for permanent workers (Kugler 2000). Evidence on large firms, especially manufacturing firms, in the metropolitan area of Johannesburg also points to a shift to temporary contracts as a result of the passage of stricter legislation in 1995–9, as shown in Table 3.3. More generally, the introduction of strict legislation in India and Zimbabwe appears to have been followed by a substantial decline in the demand for employees, with a clear causality relation, at least in the case of India (Fallon and Lucas 1991).

### ***Effect on the demographic structure of employment***

Similarly, stricter legislative regimes can increase the marginalization of outsiders. While average employment is not necessarily directly affected by strict legislation, stricter employment protection legislation tends to be associated with fewer jobs for newcomers to the labor market (youth, low-skilled workers, women, and so on). This can be explained partly by the fact that the value of severance payments rises with wages and with seniority, making it more expensive for firms to dismiss older or more well paid workers. For instance, in the OECD and in Latin America, more stringent legislation is found to increase youth unemployment more than average unemployment (Heckman and Pagés 2000 and Scarpetta 1996). The evidence for differentiated impacts on men and women is less uniform. Heckman and Pagés (2000) find that stricter legislation is associated with lower employment rates among women in the OECD, but with

higher employment rates among women in Latin America. Evidence from Chile suggests that stricter regulations reduce the employment opportunities of the young and the unskilled (thus, especially unskilled youth). It also finds that stricter regulations may force some workers, particularly women and the unskilled, out of wage employment and into self-employment (Montenegro and Pagés 2003).

### ***Effect on formal employment***

To the extent that different employers are subject to different rules (either because of their formal or informal status, or because of their sector), reforms in employment protection legislation can influence the sectoral distribution of employment. In India, stricter employment protection (in favor of workers) is found to decrease registered manufacturing output and employment (firms are registered in the formal sector once they reach a certain size) and increase unregistered (informal) manufacturing output, with no net effect on total output (Besley and Burgess 2004). Marquez (1998) finds that, in Latin America, more stringent protection is associated with a larger percentage of self-employed workers. Overall, however, the evidence is still mixed on this effect both in the OECD and in Latin America (Heckman and Pagés 2000).

### ***Effects on unemployment***

While the evidence suggests that stricter protection legislation has a negative effect on employment, the evidence concerning unemployment is ambiguous. Some workers appear to leave the labor market altogether because of reduced employment opportunities.<sup>29</sup> For example, the increased flexibility in hiring and firing introduced in Colombia is estimated to have decreased the unemployment rate by between 1.4 and 1.7 percent from the late 1980s to the early 1990s, a period of economic expansion. However, in contrast, the greater flexibility may also explain part of the surge in the unemployment rate during the late 1990s, a period of economic recession (Kugler 2000). A study of the effect of the 1990 Bolivian reform shows that the duration of unemployment decreased as a result of more relaxed legislation and that exit rates from unemployment into formal employment (especially into large firms) rose more than exit rates into informal employment (Kugler 2004).

### ***Effects on wages***

While it is difficult to isolate the effect of employment protection legislation on wages, most of the empirical work on wage determinants among temporary workers finds unexplained wage differentials. In other words,

for a given tenure, education, gender, occupation, and experience, temporary workers receive lower wages. Such residual differentials are consistent with the prepayment effect outlined above (OECD 2002).

### ***Effect on productivity***

Employment protection legislation increases job security and can therefore be expected to reduce the incentive for workers to take extra effort, which, in turn, reduces labor productivity. This applies as long as the cost of supervision is excessive so that the risk of disciplinary dismissal is limited. The effect of reforms also ultimately depends on the actual enforcement of the reform. For instance, the effectiveness of legislation depends partly on how the norms are interpreted by the courts.

In an indirect way, stricter legislation reduces the reallocation of human capital from ailing sectors to expanding sectors, resulting in an inefficient allocation of labor. More relaxed legislation may allow for a better allocation of workers among firms since the cost of experimentation with new, potentially better matched workers is lower. This may have an impact on average productivity in the economy and on growth.

Strict legislation will also likely hamper the speed at which economies adjust to shocks. Estimates based on 60 countries for the 1980s and 1990s show that, in countries where the rule of law is well established (that is, better enforcement), a shift from a low level of job security (20th percentile of the distribution in the 60 countries) to a high level of job security (80th percentile) cuts the speed of adjustment to shocks by one-third and reduces annual productivity growth by about 1 percent. In contrast, such a shift in countries with poorer enforcement does not have much impact on productivity growth (Caballero et al. 2004).

### ***Effect on poverty***

To the extent that reforms in employment protection legislation have an impact on types of employment and relative wages, they can be expected to have an impact on poverty if the people who are affected are living near the poverty line. The evidence is scarce on this type of impact. Besley and Burgess (2004) find that, in India, stricter legislation tends to reduce the size of the formal or registered manufacturing sector, which affects the urban poor. They estimate that poverty would have been 11 percent lower (that is, 520,000 fewer poor) in the state of West Bengal if the state had not passed stricter legislation. Conversely, poverty would have been 12 percent higher (that is, 640,000 more poor individuals) in the state of Andhra Pradesh if the state had not relaxed the relevant legislation.

## Unemployment benefits

In the absence of evaluations of the impact of unemployment benefits based on natural experiments, the most solid empirical evaluations of the impact of the benefits and the relevant reforms have been produced through microeconomic studies. An alternative method of assessing benefit reform at the aggregate level is to use difference-in-differences techniques to compare labor market performance in reforming and non-reforming countries before and after the policy changes.

### ***Effects of increasing the length and generosity of unemployment benefits***

A key predictor related to the baseline transmission mechanism revolves around the links between the generosity of unemployment benefits and *long-term unemployment*, which is measured as the share in all the unemployed of those who have been unemployed for more than one year. Cross-country tabulations display a positive association between the maximum duration of unemployment benefits and long-term unemployment (Boeri, Layard, and Nickell 2001).<sup>30</sup> However, several recent studies suggest that the causality may run the other way: governments in countries with a higher incidence of long-term unemployment are subject to pressure to increase the maximum duration of benefits. Indeed, in the United States, regional variations in the maximum duration of benefits tend to occur in parallel with increases in the duration of unemployment in some states (Card and Levine 2000). Indeed, Lalive, van Ours, and Zweimueller (2002) show that this policy endogeneity may lead one significantly to overstate the negative effects of benefits on the duration of unemployment. The microeconomic literature can deal more effectively with these “policy endogeneity” problems. It suggests that the duration of unemployment benefits has a strong effect on the flows from unemployment to employment. The literature draws on so-called duration analysis (Kiefer 1988) and points to the negative effects of the duration of benefits on unemployment outflows even when controlling for regional characteristics and cyclical conditions (Atkinson and Micklewright 1991; Krueger and Meyer 2002). Similarly, the reduction in the possible duration of unemployment benefits undertaken in Slovenia in 1998 appears to have had a significant positive effect on the exit rate out of unemployment to employment and to other categories of activity (Van Ours and Vodopivec 2005a, 2005b).

Overall, there is little doubt that generous unemployment benefits increase the duration of unemployment. Nonetheless, estimates of the effects of benefit generosity on unemployment duration should be viewed

with caution. The role played by policy endogeneity suggests that these estimates may be more fruitfully viewed merely as upper bounds to the elasticity of unemployment outflows with respect to benefit generosity.

The argument centered on the key transmission mechanism holds that greater benefit generosity is correlated with potential reductions in the *employment rate* of groups exhibiting elastic labor supply (via the effects on the incentives for job-seeking) and groups represented by unions (via the effects of unions on labor demand). In accordance with these predictions based on the key transmission mechanism, estimates of aggregate employment and unemployment equations (Nickell 1997; Blanchard and Wolfers 1999; Scarpetta 1999) point to the existence of a mild, but statistically significant and positive effect of the generosity of unemployment benefits on unemployment. This conclusion seems also to apply to the transition countries of Europe and Central Asia (Alam et al. 2005).

Evidence supplied through surveys of individuals and households suggests that the reservation wage of job-seekers is positively affected by unemployment benefit receipts (as predicted by the above argument based on the transmission mechanism), and this puts upward pressure on *wages*.<sup>31</sup> Estimates of earnings functions also find that the effect of unemployment benefits on wages is positive, although many different channels could generate this result.

### ***Effects of employment on conditional incentives***

Evidence related to both the earned income tax credit in the United States (Eissa and Hoynes 1998) and the working family tax credit in the United Kingdom (Blundell and Hoynes 2001) indicates that the programs have lowered employment rates among married women with working spouses. The most relevant example in Europe—at least in terms of take-up rates—is the Dutch SPAK measure (see Doudeijns, Einerhand, and Van de Meerendonk 2000), which allows employers to reduce their contributions on low wages.<sup>32</sup> The amount of the reduction declines as the wage rises, and the reduction ceases to be available at 115 percent of the statutory minimum wage. Evaluations based on general equilibrium models of the Dutch economy (De Mooij, Graafland, and Bovenberg 1998) have predicted a total increase in employment of between 1 and 5 percent among the low skilled. Evaluations of similar programs in Belgium and France report significant effects on employment. On the basis of individual data on firms, Crépon and Deplatz (2001) estimate the number of jobs created at between 255,000 and 670,000. Sneessens and Shadman-Metha (2001) estimate that, in Belgium, a cut of 21 percent in employer contributions for unskilled jobs may increase total employment of the

unskilled by 6.7 percent. All these estimates are based on different estimates of demand and supply elasticities.

### ***Effects of employment activation policies***

The jury is still out on which employment activation policies work and which do not. However, there is a consensus that different categories of individuals—youth, married women returning to the labor market, the long-term unemployed—respond more readily to different activation policies. The experimental evidence on activation policies is confined, regrettably, mostly to the United States, and nonexperimental evidence exists for the United States and some European countries. Nevertheless, for the most part, the picture that emerges is quite consistent and, at a minimum, allows some policies to be ruled out because they are not effective.<sup>33</sup>

A key result is that employment activation policies should be different for people receiving unemployment insurance and people receiving unemployment assistance. This is partially caused by differences in the average characteristics of the two groups of recipients.<sup>34</sup> Recipients of unemployment assistance include many older individuals with long unemployment spells whose employability is questionable. The evidence on how these individuals might be helped is disappointing because no strategy seems effective. To avoid wasting human and financial resources, it is therefore important to test the willingness of these individuals actively to seek work. Hence, the best strategy for recipients of unemployment assistance may be to promote slots in active labor market programs, such as training programs, and, if necessary, subsidized jobs or job-creation schemes; however, expectations should not be boosted. The strategy should be understood mainly as a screening device. A job-seeker's refusal to participate might be discouraged by providing for reductions in the duration of unemployment assistance or outright elimination of the benefit.

Australia has experimented the most with policies aimed at helping the long-term unemployed. The Australian New Start allowance for the long-term unemployed emphasized "activity agreements," which funded paid work experience or unpaid volunteer work proposed by the recipient. This was part of a "case management" approach involving greater administrative oversight of the long-term unemployed and more frequent interviews with the public employment service. The strategy proved costly, and the results were far from encouraging. In 1996, the approach was scaled back by the new Labor government, and the intervention was increasingly decentralized to private and not-for-profit organizations, with premiums for the placement of older workers.

Empirically, activation policies for women returning to the labor market have been found to be the most successful, especially when they take the form of assistance in job-seeking, counseling, and training directed at facilitating an immediate return to employment. Successful policies for other groups of unemployment assistance beneficiaries with limited labor market experience, such as unemployed youth, have proved elusive. In particular, there is evidence that training per se has very little effect on this group; constant monitoring and testing of employment activity are crucial.

For the young unemployed, the most effective scheme would seem to be the British New Deal, which is the most articulated effort to deal with this problem to date. Key features of the New Deal are (1) the combination of lump-sum wage employment subsidies and assistance in job-seeking and on-the-job training; (2) the screening during the initial four-month gateway period to separate out individuals who tend to be unemployable and minimize deadweight costs; and (3) a division of the young unemployed into two groups according to age and the duration of the unemployment spell.

Unemployment insurance recipients are individuals who experience relatively short unemployment spells and whose employability (or lack thereof) must generally still be assessed. Activation strategies aimed at these individuals therefore rely less heavily on employment activation and more on assistance in job-seeking and testing, which have proved to be among the most effective instruments.

### ***Effects of job-seeking requirements***

Evidence demonstrates the usefulness of job-seeking assistance among women and recipients of benefits who have recently become unemployed. Over and above the effects of financial incentives, the Canadian Self-Sufficiency Project and the Minnesota Family Investment Project in the United States (both targeted at welfare recipients) were designed specifically to test the *incremental* effects of policies aimed at an early reintegration into employment, primarily assistance in job-seeking, then short-term training and job counseling. The incremental effects of these policies on employment seem large: up to a 7 percentage point increase in employment rates in the case of the Self-Sufficiency Project and nearly a 10 percentage point increase in the case of the Minnesota Family Investment Project. There are also positive effects on earnings. Although these estimates should be interpreted as upper bounds, assistance in job-seeking and related activities are starting to be regarded as cost effective.

Other experiments conducted in cooperation between several states and employment services in the United States have achieved considerable cost savings by augmenting job-seeking requirements. Thus, in Switzerland, the United Kingdom, and the United States, individuals must now fill out a minimum number of job applications in a given period (usually determined case-by-case by the public employment service). Experimental evidence (mainly from the state of Maryland) shows that job counseling has a substantial effect on outflows from unemployment to jobs. Significantly, most of the increase in exits from unemployment occurred shortly before a compulsory four-day training workshop on job hunting, which represented a rise in the opportunity costs of drawing unemployment benefits. Attendance at the workshop itself did not have a significant effect on outflow rates. In other words, it was the “help and hassle” approach involved in the initiative that stimulated exits from unemployment, rather than the job-hunting training scheme per se.

## CONCLUSIONS

Assessing the potential distributional impacts of labor market interventions and reforms in labor market institutions is not a simple task. This is due to a number of factors.

First, in evaluating the potential impact of interventions and reforms on income distribution, one must distinguish between the distribution of earnings and the distribution of income. The former is defined at the level of individuals and by focusing only on employed workers. The latter is usually defined at the level of households and depends on the total labor income of all household members, plus income from other sources.

At least in the case of the policies described in this chapter, the difficulty arises from the fact that the empirical evidence suggests that labor market policies protect the prospective earnings of workers in the sectors that are covered at the expense of employment opportunities in that sector and earning levels in the rest of the economy, that is, the sectors that are not covered, whether formal or informal. As long as such an imbalance exists between earnings and employment opportunities in the covered sector, the risk is that labor market policies may lead to greater inequality and more poverty. This is particularly true in the case of labor market policies that are not directly targeted at low-income earners, but it also applies to policies designed to protect the most vulnerable workers, such as workers at minimum wage.

An increase in the minimum wage can have both a positive and a negative effect on inequality in household incomes. First, an increase in

the incomes at the lower end of the range of the formally employed typically tends to reduce inequality in individual earnings. However, it might also result in a reduction in employment among low-paid workers, for whom the minimum wage is binding, or in the transfer of some of these workers to the uncovered, lower-pay informal sector. This could increase inequality in labor incomes both among individuals and at the household level, especially if workers at the minimum wage live in households with a high proportion of low-skilled, potentially low-pay individuals. The overall direct effect on income inequality depends on labor market conditions, demographics, and household composition. The effects are also compounded by indirect changes in the uncovered sector. If labor is mobile across sectors, then the standard covered-uncovered adjustment mechanisms will come into play, and an increase in the minimum wage will lead to an increase in earnings inequality.<sup>35</sup> In this situation, the overall impact on the distribution of household incomes will depend on the employment dynamics operating between the covered and uncovered sectors, as well as on the impact of the reform on the two segments of the labor market.

Similarly, reforms of the minimum wage are also expected to have a typically ambiguous impact on the *poverty rate*. An increase in the minimum wage, for example, will usually boost the earnings of low-paid workers who maintain their jobs, and, *ceteris paribus*, this will bring the poverty rate down if the individuals are the only income earners within their households or if all low-paid earners within households maintain their employment at the prereform level. However, the increase in the minimum wage is also likely to reduce employment in the covered sector, and this will result in lower labor incomes among households if any wage earners in the households lose their jobs as a result of the policy or are forced to transfer to the lower-paying uncovered sector. This may increase the vulnerability to poverty of households that are close to the poverty line.

Thus, the impact of labor market policies and reforms of these policies on the distribution of household incomes and on poverty depends crucially on the existence of a trade-off between labor market protection and employment, that is, a trade-off between intervention and efficiency. This is not as clear cut as the advocates of liberalization would like one to believe. The arguments presented in this chapter show that both intervention and the lack of intervention may lead to inefficient and inequitable outcomes.

The desirability of a particular sort of labor market intervention therefore depends crucially on the type and characteristics of the policy.

Some policies and intervention designs generate improvements on both efficiency and equity grounds; others result in a trade-off between efficiency and equity, and still others lead to a definite worsening in both areas. Similarly, it is unwise to argue in favor of or against a particular reform without careful evaluation of the potential impact of the new policy on labor market efficiency, income distribution, and poverty.

This chapter has provided the tools required to conduct such an evaluation by (1) identifying the main channels through which the redistributive and poverty impacts of three labor market policies—the minimum wage, employment protection legislation, and the unemployment benefit—affect earnings and household incomes and (2) reviewing the existing empirical evidence on the magnitude and direction of the impacts of these policies on each link in the chain. The evidence points to a number of cases in which the labor market interventions analyzed here may have negative effects on income equality and may increase poverty rather than reducing it. However, this is clearly not the case across the board. This leaves policymakers faced with the challenge of designing interventions that strike the right balance between reducing income inequality and curbing poverty on the one hand, while continuing to protect the living standards of workers. This can only be done effectively by mastering the factors that lead to the existence of tensions between labor market interventions and employment. It requires policies that are at once pro-growth and pro-equity. Some of the innovative policies introduced recently by a number of countries in Central Europe and Latin America to maintain the incomes of the unemployed seem to answer this challenge. Among these are conditional transfer programs and employment activation programs.

## NOTES

1. The theory of the second best assumes that, if one of the conditions necessary to achieve Pareto optimality is missing, then the “second best” position can only be reached by departing from all the other Paretian conditions. Pareto efficiency is defined as the efficiency of a market that is unable to produce more from the same level of inputs without reducing the output of another product.
2. The insider-outsider theory, developed by Lindbeck and Snower (1989), argues that existing workers, *insiders*, enjoy a relatively advantageous position and expropriate rents from their employers thanks to the high barriers to employment faced by unemployed and entrant workers, the *outsiders*. However, in this chapter, “insiders” is used to refer to the workers covered by labor market regulations, and “outsiders” is used to refer to the unemployed

or to those people working in uncovered jobs in the formal or the informal sectors. This distinction is somewhat better defined than that between formal and informal employment.

3. The focus of the chapter is on statutory regulations and interventions. This is so despite the fact that, in many countries, these types of policies have been replaced through voluntary negotiations and agreements between labor and managers; these act in a way very similar to the mandatory steps described. The voluntary agreements are not explicitly analyzed here.
4. Other types of labor market institutions and regulations that are not analyzed here include labor unions, labor standards, wage-setting laws (other than minimum wages), collective bargaining, the constraints imposed in the context of privatization (for example, no retrenchment), pensions, active labor market programs (such as public works), the public sector's role in the labor market, training and retraining programs, microfinance and unemployment lending, and payroll taxes.
5. For instance, Scarpetta (1996) finds that the size of the impact of strict employment protection legislation on unemployment depends on the wage-bargaining system. Such interactions are not systematically reviewed here.
6. For an extensive review of different types of employment protection legislation and the relative advantages, see Betcherman, Luinstra, and Ogawa (2001).
7. This can represent a substantial cost when the period is long. For instance, prior to the 1999 reforms in Brazil, more than 6 percent of all salaried workers (about 2 million workers) filed lawsuits every year, and the average dispute took almost three years. (This was cut in half by the reforms; see World Bank 2002.) The number of cases and the length of court hearings vary greatly in the OECD. Up to 20 percent of layoffs become subjects of court proceedings in France, with an average dispute lasting over a year (OECD 2004).
8. Of course, these laws only formally apply to workers in the formal economy, which often represents a very small share of the total number of workers.
9. The *working poor* are those workers who are employed full time and, nevertheless, appear to be living close to the poverty line.
10. Fondazione Rodolfo DeBenedetti, <http://www.frdb.org>.
11. Labor market monopsony refers to the situation wherein a dominant employer is, in essence, a single "buyer" of labor services in a particular segment of the labor market. Under this condition of demand-side monopoly, the monopsonist employer pays lower wages and employs less labor than would employers in the case of perfect competition.
12. This distinction is somewhat sharper than that between formal and informal labor markets as highlighted by the theory of labor market duality.
13. This prediction requires that labor mobility be perfect between the two sectors.
14. The poverty rate is usually measured as the proportion of individuals whose *incomes* are less than a threshold value referred to as the *poverty line*.
15. The best description of this mechanism is contained in the work of Bentolila and Bertola (1990) and Bertola (1999). Ljungqvist (2002) studies

- this transition mechanism through a variety of models and finds that it is quite robust.
16. Spain is the most prominent example in this respect. There, the share of workers hired on temporary contracts is now as high as 30 percent (Dolado, García-Serrano, and Jimeno 2002).
  17. See Garibaldi and Violante (2002).
  18. So called from the properties of putty and clay. Putty can be molded as one might wish before it is baked, but, through baking, putty becomes hardened clay, and the shape can no longer be altered.
  19. When the elasticity of labor demand is larger than that of labor supply, the employment effect will be larger than the earnings effect.
  20. Crépon and Deplatz (2001); De Mooij, Graafland, and Bovenberg (1998); Doudeijns, Einerhand, and Van de Meerendonk (2000); European Commission 1999; Sneessens and Shadman-Metha (2001).
  21. See, for example, Carneiro (2004) on Brazil.
  22. Note that this type of equation is econometrically identified only if the firm is a price-taker in the labor market, so that the monopsonistic model does not apply. To insure proper identification, these studies often use a lagged value for the minimum wage.
  23. Note that this result is coherent with the prediction of the monopsony model, since it confirms the greater attachment of youth to their jobs when wages improve.
  24. The three data sets used were the labor force surveys, the British household panel survey, and the matched new earning surveys for the period after 1999.
  25. See Maloney and Mendez (2004) and Eriksson and Pytlikova (2004).
  26. For a summary and discussion, see Addison and Teixeira (2003) and Heckman and Pagés (2003).
  27. Firms in service industries, particularly in tourism, also reduced their hiring, as is evident in Table 3.3.
  28. Additional examples are summarized in Heckman and Pagés (2000).
  29. See Heckman and Pagés (2003) for a summary of the evidence.
  30. The best example is probably offered by transatlantic differences in unemployment rates. These differences can be almost entirely explained by the differences in long-term unemployment rates. Meanwhile, unemployment benefits in Europe are significantly more generous than those in the United States.
  31. The reservation wage is the lowest wage at which a job-seeker would consider a job offer.
  32. SPAK is short for *Specifieke Afdrachtskorting* (specific tax rebate).
  33. For a detailed review of the evidence on this issue, see Betcherman, Olivas, and Dar (2004).
  34. Unemployment assistance covers workers who have been unemployed for a long time and the other individuals without occupation, such as youths with no or limited labor market experience, mothers returning to the labor mar-

- ket after exhausting maternity protection, disabled individuals, and older, long-term unemployed who have exhausted unemployment assistance. Unemployment insurance covers other unemployed workers who have accumulated enough contributions to be eligible for unemployment benefits.
35. The potential negative impact is reduced if there is a lighthouse effect, since a higher minimum wage leads to an increase in wages in the market, whether covered or uncovered.

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ANNEX

1

# Characteristics of the Minimum Wage in Selected Countries

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
<i>Europe and Central Asia</i>		
Albania	The national minimum wage rate is set in an order of the government.	The national minimum wage rate applies to all workers.
Bulgaria	The government sets the national minimum wage rate by decree.	The national minimum wage rate applies to all workers and employees.
Cyprus	There is no national minimum wage. The government sets minimum wage rates for selected low-wage occupations. These minimum rates are adjusted yearly.	Only workers in the occupations specified by the government.
Czech Republic	The government stipulates the national minimum wage rate in an official decree. It also sets 12 minimum tariff rates for different grades. The minimum wage is adjusted yearly.	The Labor Code applies to all employees except those who work for a company registered in the Czech Republic, but work and reside in a foreign country. Employees of a company with foreign capital interest may be excluded if the government specifies a regulatory framework that governs them.
Estonia	The minimum wage and the procedures to amend it are set by the government based on a bipartite agreement between worker and employer organizations.	The minimum wage rate applies to all workers employed under an employment contract.
Hungary	The minimum wage rate is determined by the government. The National Labor Council is consulted during the process, and minimum wage rates are subject to its agreement.	Minimum wage regulations apply to all, including public service officials otherwise exempt from the Labor Code. They apply also to employees of Hungarian employers working abroad, but not to foreign employers and their employees working in Hungary.
Latvia	Minimum wage rates are determined by the government.	The Labor Law of 2001 covers all employees and employers.
Lithuania	The government determines minimum wage levels according to the recommendations of a tripartite council.	Regulations apply to all workers employed in Lithuania or posted abroad by their employers. They do not apply to foreign employers who post employees to Lithuania.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>The government may establish a lower minimum wage rate for young workers to facilitate their entry into the workforce.</li> </ul>	PPP\$195.27 per month.
<ul style="list-style-type: none"> <li>During an apprentice's training period, which cannot exceed six months, the wage may not be less than 90% of the minimum wage.</li> <li>Piece-rate workers.</li> </ul>	PPP\$213.02 per month.
<ul style="list-style-type: none"> <li>The minimum wage order applies to shop assistants, clerks, nursing aids, and child-care workers.</li> </ul>	US\$618.00 per month for the first six months.
<ul style="list-style-type: none"> <li>A minimum wage rate that is slightly lower than the regular rate applies during the first six months of employment with a new employer.</li> </ul>	US\$657.60 per month after the first six months.
<ul style="list-style-type: none"> <li>When employers do not sign a collective agreement with trade unions, they must pay their employees at least the minimum tariffs for the grade of the employees.</li> </ul>	PPP\$466.48 per month.
<ul style="list-style-type: none"> <li>Employees between 18 and 21 years of age are entitled to 90% of the minimum wage for a six-month period. Employees under 18 are entitled to 80% of the minimum wage.</li> </ul>	
<ul style="list-style-type: none"> <li>Employees with partial disability pensions are entitled to 75% of the minimum wage. Employees with full disability pensions and disabled juveniles without pensions are entitled to 50% of the minimum wage.</li> </ul>	
	PPP\$384.75 per month.
	.
<ul style="list-style-type: none"> <li>The Labor Code provides that separate rates may be set for a specific field or area. In fact, no separate rates have been set.</li> <li>Minors, disabled employees, and part-time employees may receive less than the minimum wage only if a derogation is issued by the National Labor Council. No such derogation has been issued.</li> </ul>	PPP\$420.80 per month.
<ul style="list-style-type: none"> <li>A separate minimum hourly rate is established for workers under 18 years of age.</li> </ul>	PPP\$335.61 per month.
<ul style="list-style-type: none"> <li>The legislation provides that specific wage rates may be set for categories of employees and different branches of the economy. In fact, no specific rates have been set.</li> </ul>	PPP\$313.73 per month.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Poland	The Tripartite Commission negotiates minimum wage levels by July 15 every year based on the government's proposal. If the commission does not reach a consensus, the government sets the minimum wage, which cannot be lower than what it proposed to the commission. The minimum wage is adjusted yearly, unless forecasted inflation is above 5% (adjusted twice a year).	The minimum wage applies to all employees in full-time employment.
Romania	The government sets a national minimum wage rate following consultations with social partners.	The Labor Code applies to all Romanians working in Romania or overseas if employed by a Romanian employer (unless the legislation of the host country is more favorable), and to foreigners working in Romania for a Romanian employer.
Russian Federation	The federal government establishes a national minimum wage rate. The Labor Code provides for social partnership involving mutual consultations on guarantees of employee labor rights and improvements to labor laws in general.	The national minimum wage applies to all nonqualified workers in an employment relationship.
Slovenia	The government sets the minimum wage rate by special regulation in accordance with a tripartite pay policy agreement. The Economic and Social Council of Slovenia is frequently the forum at which minimum wage negotiations take place.	The minimum wage applies to all employees in the private sector with no exception. All employers must pay a wage that is at least equal to the minimum wage.
Slovakia	The government sets the minimum wage rate by special regulation following the recommendation of social partners. The minimum wage is adjusted yearly.	The Labor Code applies to all employees, including those working for foreign employers, unless otherwise stipulated. Employees posted to another EU member state are governed by that state's regulations provided their stay exceeds one month and work exceeds 22 days in the year.

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>• First-time entrants to the labor market may receive less than the minimum wage rate. As of the end of 2005, remuneration for first-time entrants could not be less than 80% of the minimum wage for the first year and 90% for the second year of employment.</li> <li>• Other categories—For employees working on a part-time basis the amount of minimum wage is reduced proportionally to the actual number of hours worked.</li> </ul>	PPP\$448.86 per month.
	PPP\$224.02 per month.
<ul style="list-style-type: none"> <li>• States may establish regional minimum wage rates that are higher than the national minimum wage. Regional minimum wage rates are subject to the consent of the federal government.</li> </ul>	PPP\$59.47 per month.
	PPP\$818.16 per month.
<ul style="list-style-type: none"> <li>• If there is no collective agreement, the employer must pay a minimum wage according to the difficulty of the position, ranging from once to twice the minimum wage.</li> <li>• Juveniles between 16 and 18 years of age receive 75% of the minimum wage. Juveniles under 16 receive 50% of the minimum wage.</li> <li>• Employees with partial-disability pensions receive 75% of the minimum wage, while those with full-disability pensions and disabled persons under 18 receive 50% of the minimum wage.</li> </ul>	PPP\$376.01 per month.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Turkey	Minimum wage rates are set by the Minimum Wage–Setting Board. The rate is supposed to be adjusted every two years. In practice, rates have been adjusted every 6 to 12 months.	The provisions of the Labor Act concerning the minimum wage apply to all employees.
<i>Africa</i>		
Angola	The minimum wage is set by decree of the Council of Ministers based upon the proposal made by the minister of protection, labor, and finance.	All workers are covered by minimum wage regulations. The government may exclude workers covered by a collective agreement signed within six months preceding the issue of the decree setting the minimum wage.
Botswana	Minimum wage rates are set by sector. The minister of labor must consult the Minimum Wage Advisory Board when adjusting or setting rates for trade or industry that may require a statutory minimum wage rate, but is not obliged to accept the board's recommendations. Additionally, the minister must publish a notice in the Official Gazette announcing the intention to alter rates before any adjustment is made. In practice, the rates are adjusted each year.	Minimum wage rates apply only to workers in the sectors set forth in the Employment Act, 1982. Unless the minister of labor issues a specific regulation, government officials are not covered by any minimum wage rate order.
Burkina Faso	The government determines one minimum wage rate for nonagricultural workers and one minimum wage rate for agricultural workers after receiving the opinion of the Labor Advisory Commission.	Minimum wage provisions apply to all workers except those employed in public administration and apprentices.
Cape Verde	There is currently no minimum wage in Cape Verde.	
Chad	The 1996 Labor Code provides for minimum wages to be determined in agreement with organizations representing employers and workers. In practice, minimum wage rates have not been adjusted since 1994.	The minimum wage applies to all workers.

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>There is a lower minimum wage rate for workers younger than 16 years of age. The minimum wage rate is currently TL378,000,000 per month (US\$251.85) for employees younger than 16.</li> </ul>	PPP\$590.93 per month for employees 16 years of age and above.
<ul style="list-style-type: none"> <li>The legislation provides that the minimum wage rates may be set by sector or by territorial region. However, as of 2003, only one national minimum wage rate had been established.</li> </ul>	US\$50 per month.
<ul style="list-style-type: none"> <li>The minister of labor sets minimum wage rates for night watchmen.</li> <li>The minister of labor may establish minimum wage rates for building and construction; exploration and quarrying industry; garage and motor trade; road transport industry; hotel, catering, and entertainment trade; manufacturing, service, and repair trade; and wholesale and retail distribution trade.</li> <li>Disabled persons to whom a wage order applies or their prospective employers may apply for a permit authorizing them to be paid less than the minimum wage rate.</li> </ul>	PPP\$0.86 per hour for night watchmen. PPP\$1.02 per hour for workers in trades set forth in the Employment Act other than the retail distribution trade.
<ul style="list-style-type: none"> <li>Piece-rate workers must receive wages that are proportional to those that would be received by a full-time worker.</li> </ul>	PPP\$0.89 per hour for agricultural workers. PPP\$0.97 per hour for nonagricultural workers.
<ul style="list-style-type: none"> <li>Minimum wage rates vary according to occupation and seniority.</li> <li>Separate minimum wage rates have been established for agricultural workers and nonagricultural workers.</li> <li>Workers between 14 and 18 years of age who are not working under a contract of apprenticeship may not receive less than 80% of the relevant minimum wage rate.</li> <li>The amount paid to a piece-rate worker must be proportional to what a worker paid per hour would receive for the same work.</li> </ul>	PPP\$171.45 per month for nonagricultural workers. PPP\$173.06 per month for agricultural workers.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Gabon	The government sets a national minimum wage rate. It may also set minimum wage rates for certain professions if collective agreements do not provide minimum rates. The National Wage Committee must meet at least once every three years.	The minimum wage applies to all workers.
Ghana	The national daily minimum rate of remuneration is determined by the National Tripartite Committee.	Before the Labor Act of 2003, regulations did not apply to part-time workers, piece workers, sharecroppers, sea-going personnel who are not wage earners, and apprentices. In the absence of any revocation, these exemptions are assumed to apply.
Guinea-Bissau	The government sets the minimum wage rates by decree following consultation with social partners. This consultation takes place within the Social Dialogue Council (Conselho Permanente de Concertação Social), a tripartite advisory body. There are two national minimum wage rates: one for agricultural workers, and one for nonagricultural workers.	The minimum wages apply to all salaried workers, except domestic workers and public servants. Public servants are covered by a separate wage-setting system.
Lesotho	Minimum wage rates are set according to occupations in wages orders issued by the minister of labor on the basis of recommendations and proposals of the Wages Advisory Board. The Wages Advisory Board must examine the rates annually.	The minimum wage applies to all workers. Workers whose occupation is not specified in the wages orders must be paid at least the rate for unskilled laborers.
Madagascar	The government sets a national minimum wage rate and a wage scale for nonagricultural workers and agricultural workers based on recommendations of the National Employment Council.	The Labor Code applies to all workers whose employment contract was entered into in Madagascar.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: Variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Workers paid on a piece-rate basis must be paid at a rate that a worker of average capabilities working normally would be paid.</li> </ul>	PPP\$111.35 per month.
<ul style="list-style-type: none"> <li>The minister of labor may issue a permit excluding a person affected by some type of infirmity, physical injury, or disability from the legislative provisions concerning minimum wage.</li> </ul>	PPP\$7.69 per day.
<ul style="list-style-type: none"> <li>The law provides that different national minimum wages can be set by sector.</li> <li>An employee under the age of 16 shall be paid no less than 60% of the national minimum rate. An employee between the age of 16 and 18 shall be paid a rate not less than 80% of the national minimum rate. A minor with more than six months of employment in the same activity shall be paid the full minimum rate.</li> </ul>	PPP\$25.00, plus one bag of rice per month.
<ul style="list-style-type: none"> <li>Minimum wage rates have been established for the following occupations: drivers; hammer mill operators; junior clerks; machine operators; machine attendants; messengers; receptionists; shop assistants; telephone operators; ungraded artisans; unskilled laborers; waiters; trainee weavers and sewing machine workers; watchmen; domestic workers; and copy-typists.</li> <li>Workers employed by small businesses whose occupation is not specified in a wages order must be paid at least the minimum wage rate for small businesses, which is lower than the rate for unskilled laborers.</li> <li>Wage rates are set on a wage scale that allows for rates to vary in accordance with level of seniority and professional category.</li> <li>Rates paid to piece workers must be such that an average worker working at a normal rate receives the same wage as workers being paid according to the time worked.</li> </ul>	PPP\$105 per month for domestic workers. PPP\$210.5 per month for workers in small businesses. PPP\$310.50 per month for unskilled laborers. PPP\$595.50 per month for drivers. PPP\$70.4 per month for nonagricultural workers. PPP\$80.63 per month for agricultural workers.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Mauritius	There is no national minimum wage. The minister of labor sets minimum wage rates for workers in the private sector in industry-wide remuneration orders on the basis of recommendations from the National Remuneration Board; he may accept, reject, or amend the recommendation. The Pay Research Bureau establishes wages for public sector workers. Each year, on July 1, the wages of private sector workers are adjusted for increases in the cost of living.	Minimum wages have been established for 29 industries and occupations in the private sector. Workers in other industries or occupations have no statutory minimum wage rate.
Mozambique	Minimum wage rates are set by consensus by the Labor Advisory Commission with the participation of social partners. Agreements are announced by the government. If no agreement proves possible, the government sets the minimum wage rates.	A minimum wage rate is determined for agricultural workers, and another for workers in industry, trade, and other activities.
Namibia	There is no national minimum wage. Minimum wage rates may either be set by the government in wage orders or in collective agreements. All minimum wage rates are currently set in collective agreements. Adjustments to the rate in the agricultural sector should be discussed on an annual basis.	Minimum wage rates apply to agricultural workers in a collective agreement and workers in the mining and construction sectors.
Nigeria	A national minimum wage is determined by the government. In 2000, when the national minimum wage rate was updated, an ad hoc tripartite committee was formed to facilitate discussions on the new rate.	National minimum wage rates do not apply to: establishments employing fewer than 50 workers, part-time workers, workers paid on a commission or piece-rate basis, workers in seasonal employment such as agriculture, and workers in merchant shipping or civil aviation.
São Tomé and Príncipe	The government sets the minimum wage rate.	The minimum wage rate applies to all workers. However, the legislation does allow different sectoral minimum wages.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Apprentices or trainees in public transport; printing; catering; block making, construction, and stone crushing; electrical, engineering, and mechanical workshops; furniture workshops; newspapers and periodicals; and tailoring have a special rate.</li> <li>Workers between 15 and 18 years of age receive lower rates in the sugar, livestock, field crop and orchards, and tea industries.</li> <li>A disabled worker or prospective employer may apply for a reduced minimum wage rate.</li> <li>Certain remuneration orders provide that the minimum wage rate for workers paid on a piece-rate basis must be 10% higher than the minimum wage rate for workers paid on a monthly basis.</li> </ul>	<p>PPP\$39.40 per week for unskilled workers in export-processing zones.</p> <p>PPP\$378.46 per month for unskilled workers in the printing industry (first year).</p> <p>PPP\$166.8 per month for agricultural workers.</p> <p>PPP\$232.00 per month for civil service, industry, and services workers.</p> <p>PPP\$76.36 per month.</p>
<ul style="list-style-type: none"> <li>Persons who have an infirmity or physical disability may be paid less than the national minimum wage rate provided their employers have been granted an exemption by the minister of labor.</li> </ul>	<p>PPP\$117.77 per month.</p>
<ul style="list-style-type: none"> <li>An employee under the age of 16 years shall be paid at least 50% of the relevant national or sectoral minimum rate. An employee between the age of 16 and 18 shall be paid at least 60% of the relevant national or sectoral minimum rate.</li> </ul>	<p>US\$23.50 per month.</p> <p>US\$25.70 per month for civil servants.</p>

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Senegal	There are national minimum wage rates for nonagricultural workers and agricultural workers. In addition, minimum wage rates higher than these rates can be set by joint committees for sectors covered by collective agreements.	The minimum wage rates for agricultural and nonagricultural workers apply to all workers.
South Africa	A dual system of minimum wage–setting has been established. The government may set rates for certain sectors in sectoral determinations, following recommendations of the Employment Conditions Commission. In addition, minimum wage rates may be determined in collective agreements. Most of the sectoral determinations predetermine increases (or link them to the consumer price index) for the subsequent three years.	The Basic Conditions of Employment Act applies to all employees and employers, except members of the National Defense Force, the National Intelligence Agency, and the Secret Service, unpaid volunteers working for charitable organizations, and persons employed on sea vessels. Sectoral determinations may not apply to workers already bound by collective agreements.
<i>East Asia and the Pacific</i>		
Cambodia	The Ministry of Labor sets a guaranteed minimum wage based on recommendations made by the Labor Advisory Committee.	The Labor Code applies to all professional, charitable, and educational enterprises. It does not apply to judges; permanent public servants; members of the police, army, military forces, air and maritime transportation personnel (governed by a separate statute); and domestic workers.
China	The government is responsible for implementing a system of regional minimum wage rates; there is no national minimum wage rate. Standards are stipulated by provincial, regional, and municipal governments and reported to the State Council for consent. They are adjusted at least once every two years.	The provisions concerning minimum wages apply to enterprises, private nonenterprise entities, individual industrial and commercial households, and the laborers who have formed a labor relationship with them.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Workers paid by the piece and working for at least two weeks must receive at least 90% of the applicable minimum wage.</li> </ul>	PPP\$0.82 per hour for agricultural workers. PPP\$0.94 per hour for nonagricultural workers.
<ul style="list-style-type: none"> <li>Sectoral determinations have been established for domestic workers, contract cleaning workers, private security workers, farm workers, wholesale and retail workers, welfare workers, and engineers.</li> <li>Minimum wage rates vary by region.</li> <li>In the wholesale and retail sector, a specific minimum wage rate is stipulated for trainee managers and trainees. Also, employees who perform commission work must receive at least two-thirds of the applicable minimum wage.</li> </ul>	PPP\$280.39 per month for farm workers. PPP\$514.31 per month for general assistants in the wholesale and retail sector.
<ul style="list-style-type: none"> <li>As of October 2003, minimum wage rates had only been set for the textile, garment, and shoe manufacturing industries.</li> <li>Minimum wage rates may vary regionally.</li> <li>Workers on a probation period (one to three months) may receive a minimum wage slightly lower than the regular rate.</li> <li>Piece-rate workers must be paid by the hour at least the amount guaranteed to a worker earning the minimum wage.</li> </ul>	US\$45 per month for regular workers in the textile, garment, and footwear sector.
<ul style="list-style-type: none"> <li>Different minimum wage rates may be set in each province and within the separate administrative areas of each province. All of China's 39 provinces, regions, and municipalities are subject to minimum wage legislation.</li> </ul>	PPP\$104.80 per month in certain towns in Jiangzxi region. PPP\$350.21 per month in Shanghai city.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Fiji	There is no national minimum wage in Fiji. The government may establish Wages Councils for groups of workers if no collective bargaining mechanism is in place. Wages Councils make wage regulation proposals to the minister of labor who may enact the proposal as an order. Minimum wages for sectors of the workforce not covered by Wages Councils are determined in collective agreements.	Only workers in sectors covered by Wages Councils are entitled to statutory minimum wage rates.
Indonesia	The governor of each province sets minimum wage rates for the respective province or regency. The Law on Manpower Affairs provided that a National Wage Council, Provincial Wage Councils, and District/City Wage Councils should be established to develop a national wage system. Minimum wages are reviewed by each province on a yearly basis.	All workers are covered by minimum wage regulations except for domestic workers. The legislation provides for exceptions for companies unable to pay minimum wage rates.
Korea, Republic of	The minister of labor sets the national minimum wage each year, following the Minimum Wage Council's proposal. If the minister of labor does not agree with the wage proposal, but two-thirds of the Council support it, the minister must adopt the proposal. The minister of labor publishes the rate proposals, and representatives of workers or employers may raise objections within 10 days of publication.	The minimum wage applies to all workers, except domestic workers and businesses using only relatives living together. An employer may obtain permission to exclude certain workers from minimum wage provisions in cases of disability, probation (a maximum of three months), training, or for workers engaged in surveillance or intermittent work.
Lao PDR	The Labor Act of 1994 states that the government or other relevant body will establish minimum wage rates for each region.	The Labor Act applies only to workers in the formal sector. The Act does not apply to civil servants employed in state administrative and technical services, national defense, or public order.

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>• Rates are set for the building, civil, and engineering trade; wholesale and retail trade; hotel and catering trade; road transport; mining and quarrying industries; saw milling and logging industry; printing trades; garment industry; and manufacturing industry.</li> <li>• All apprentices are entitled to minimum hourly rates in accordance with the number of years of apprenticeship completed.</li> <li>• A few industries have set separate rates for workers under 18.</li> <li>• A disabled worker, employer, or prospective employer may apply for a reduced minimum wage rate to apply to the worker.</li> <li>• The minimum wage is increased by 25% for casual workers.</li> </ul>	<p>PPP\$1.31 per hour for learners in the garment industry.  PPP\$2.16 per hour for workers in printing trades.</p>
<ul style="list-style-type: none"> <li>• Many provinces have set a basic minimum wage that applies to all sectors. However, provinces are entitled to set separate minimum wages for each sector on the basis of agreements between corporate organizations and worker unions or labor federations.</li> <li>• Workers on probation must be paid the minimum wage.</li> <li>• Piece-rate workers, contractors, and freelancing daily workers are covered if they are employed for one month or more.</li> </ul>	<p>PPP\$113.88 per month in East Java.  PPP\$255.06 per month in the province of Jakarta.</p>
<ul style="list-style-type: none"> <li>• Separate minimum wage rates may be set for seamen.</li> <li>• Workers under the age of 18 employed for less than six months should receive 90% of the applicable minimum wage rate.</li> <li>• Workers with a disability may be excluded from minimum wage protection.</li> <li>• Piece-rate workers must receive hourly wage rates equivalent to the minimum wage rate. The Minimum Wage Act stipulates that a separate minimum wage rate may be determined for piece workers. No decrees in this regard have yet been made.</li> <li>• The legislation also applies to contractors, for whom the minimum wage rate shall be determined according to a certain unit of output or achievement.</li> </ul>	<p>PPP\$674.74 per month.</p>
<ul style="list-style-type: none"> <li>• Workers on a probationary period must receive at least 90% of the applicable minimum wage (for a maximum of one or two months).</li> <li>• Workers may only be paid on a piece-rate basis if the government or relevant body has not established a minimum wage rate for a specific region, or if the employer allows workers to bring and do supplementary work outside their labor unit.</li> </ul>	<p>PPP\$46.19 per month.</p>

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Malaysia	There is no national minimum wage. The government may establish Wages Councils for certain nonunionized sectors of the workforce not covered by collective agreements. These councils submit wage regulations proposals, which the government may choose to enact in a wage regulation order.	Wages Councils have been established for certain nonunionized sectors of the workforce not covered by collective agreements. Casual workers or someone employed other than for the purposes of the employer's business are excluded from minimum wage protection.
Papua New Guinea	A Minimum Wages Board may make determinations on minimum wages, which must be approved by the head of state. Currently, one national minimum wage rate has been established. Minimum wages may also be set in registered awards and common rules. A 1992 determination states that future determinations should be made following negotiations between employers and employees, which has not happened to date.	The minimum wage applies to all employees and employers.
Philippines	Regional Tripartite Wages and Productivity Boards determine minimum wage rates applicable in their regions, provinces, or industries subject to the guidelines set by the National Wages and Productivity Commission. In addition, the secretary of labor and employment may establish the minimum wage rate for home workers and those employed in cottage industries. Wage orders should be determined whenever conditions in the region so warrant, but no sooner than 12 months after issuance of rates by the boards, unless particular circumstances warrant it.	The provisions do not apply to domestic workers, home workers carrying out needlework, or workers in cottage industries. A minimum wage rate for domestic workers is provided separately. Retail or service establishments with fewer than 10 workers may apply to be excluded from the requirements.
Solomon Islands	The minister of labor may set minimum wage rates. The minimum wage may be abated by way of a collective agreement if the commissioner for labor provides a written permit for such abatement.	The minimum wage provisions apply to all workers except domestic workers and seamen.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Minimum wage rates are set for workers in the catering and hotel sector and for stevedores, cinema workers, and shop assistants.</li> <li>For shop assistants, two regions have been identified with different rates, and specific minimum wages rates have been set for apprentices.</li> <li>Workers in the catering and hotel sector and shop assistants receive different minimum wage rates if between 14 and 16 or 16 and 18.</li> <li>An employer or prospective employer of a disabled person may apply for a reduced minimum wage to the relevant Wages Council.</li> </ul>	<p>PPP\$94.98 per month for cinema workers.</p> <p>PPP\$153.19 per month for shop assistants in certain urban districts.</p>
<ul style="list-style-type: none"> <li>New entrants to the workforce between 16 and 21 years of age are entitled to 75% of the national minimum wage rate.</li> </ul>	<p>PPP\$28.12 per week.</p>
<ul style="list-style-type: none"> <li>Domestic workers are covered by specific wage rates.</li> <li>The regional boards set minimum wage rates for at least two categories: agricultural and nonagricultural workers. There are also specific rates for hospital workers in 7 regions; retail/service workers in 12 regions; cottage workers in 10 regions; and school workers in 3 regions.</li> <li>Apprentices receive at least 75% of the applicable minimum wage for the first six months.</li> <li>Disabled workers receive at least 75% of the minimum wage.</li> <li>Workers paid by output must not receive less than the applicable minimum wage.</li> </ul>	<p>PPP\$8.24 per day for retail and service workers in selected areas.</p> <p>PPP\$21.41 per day for nonagricultural workers in the National Capital Region.</p>
<ul style="list-style-type: none"> <li>A separate rate is set for the fishing and agriculture sectors.</li> <li>Disabled workers may apply for an exemption from minimum wage provisions, and this would lead to the setting of the applicable wage rate.</li> </ul>	<p>PPP\$0.47 per hour for the fishing and agricultural plantation sector.</p> <p>PPP\$0.58 per hour for all other sectors.</p>

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Thailand	The National Wage Committee makes a recommendation concerning adjustments to the basic minimum wage rate. In addition, tripartite provincial committees can recommend a minimum wage higher than the basic rate for certain provinces. The National Wage Committee must report to the labor minister at least once a year.	The Labor Protection Act does not apply to central, provincial, and local administration and state enterprises governed by the Law on State Enterprises, or to agricultural workers, domestic workers, or employers who run private schools.
Vietnam	The Ministry of Labor, War Invalids, and Social Affairs may set minimum wage rates that vary across regions and for local or foreign firms. The legislation does not set specific time periods for adjustment.	The Labor Code applies to all workers.
<i>Latin America and the Caribbean</i>		
Argentina	The National Council for Employment, Productivity, and the Adjustable Minimum Living Wage periodically determines the adjustable minimum wage. The government did not convene the council in setting the minimum wage for January 2004, since the economic crisis and the need for an urgent rise in wages constituted exceptional circumstances, but set the wage by presidential decree. The minimum wage can be adjusted at any time at the request of any social partner.	The minimum wage applies to both private and public sector workers.
Bahamas	Statutory minimum wage rates are set by the government. Separate rates are established for workers employed by the week, the day, or the hour. Prior to any increase in the minimum wage rates, consultation must take place with representatives of employers and an association of registered trade unions.	Minimum wages apply to all employees in the private and public sectors. The Minister of Labor may exclude certain persons or sectors. Children and young persons (no definition provided) are excluded from minimum wage protection.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Minimum wage rates have been established for certain provinces that are higher than the basic minimum wage rate.</li> </ul>	From PPP\$10.53 per day to PPP\$13.38 per day.
<ul style="list-style-type: none"> <li>Two rates are set, for local and foreign-invested enterprises.</li> <li>Apprentices and trainees must receive at least 70% of the applicable wage rate for an employee performing the same job.</li> <li>Employees on a trial period must receive at least 70% of the applicable wage rate for the relevant rank of the job.</li> <li>Piece-rate workers may be paid wages according to the number of items produced.</li> </ul>	PPP\$96.97 per month for workers in local enterprises. PPP\$209.32 per month for workers in foreign-invested enterprises in Hanoi City and Ho Chi Minh City.
<ul style="list-style-type: none"> <li>The remuneration of home workers is determined by parity commission.</li> <li>Minimum wages for domestic workers are set by the Ministry of Labor and Social Security Resolution.</li> <li>A specific minimum wage rate, which may not be lower than the national minimum wage rate, may be set for agricultural workers by the executive.</li> <li>Apprentices, minors, and disabled workers may receive a minimum wage lower than the national rate for adult workers.</li> </ul>	PPP\$531.81 per month.
	PPP\$157.89 per week.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Belize	Minimum wage rates are set by the Minister of Labor for workers covered by a Wages Council. These councils were established in response to a lack of effective wage regulation by collective agreement for the workers concerned. Wages Councils submit wage proposals to the minister, who may make a wages regulation order for the workers concerned.	Only workers covered by a wages regulation order are covered. Casual workers are excluded.
Bolivia	The Ministry of Labor sets the minimum wage for different regions and categories of workers. In practice, the president, together with the Council of Ministers, sets the minimum wage by supreme decree.	The minimum wage applies to all workers in the public and private sectors. There is one general minimum wage rate for all employees except agricultural workers.
Brazil	The national minimum wage rate is set by law. Currently, the minimum wage is set by a provisional measure in accordance with the Federal Constitution and placed before Congress for conversion into law. The legislation establishes that minimum wage adjustments should take place every three years; however, in reality, the rate has been set annually.	
Chile	The government sets two minimum wage rates by law: one for workers between 18 and 65 years old, and one for workers under 18 and over 65. A rate for “nonremunerative” purposes is also set and used solely as a reference point for calculating fines, taxes, fees, and so on. It does not establish the actual minimum wage to be paid to workers.	Minimum wage legislation applies to workers in the private sector. Remuneration for apprentices and mentally disabled workers is freely agreed by parties and is not subject to minimum wage legislation.
Colombia	The minimum wage is set by the Permanent Commission on the Harmonization of Wage and Labor Policies through an executive decree. If the commission cannot reach consensus, the government sets the minimum wage. The commission is a tripartite institution made up of government, worker, and employer representatives. The minimum wage is adjusted once a year.	All workers in the private sector are covered by minimum wage legislation.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Minimum wages have been established for manual workers, shop assistants, and domestic helpers.</li> <li>Workers that are infirm or incapacitated may apply for an exception from a wage regulation order.</li> <li>Students employed as shop assistants are entitled to a lower minimum wage rate than regular workers.</li> </ul>	<p>PPP\$2 per hour for students employed as shop assistants and manual workers engaged in agriculture, agroindustry, or export-oriented industries.</p> <p>PPP\$2.25 per hour for other workers.</p> <p>PPP\$163.71 (assumed to be per month).</p>
<ul style="list-style-type: none"> <li>For piece-rate workers, the wage is set to ensure that it is no lower than the normal daily minimum wage.</li> </ul>	<p>PPP\$235.41 per month.</p>
<ul style="list-style-type: none"> <li>There is a specific minimum wage rate for workers under 18 or over 65.</li> <li>The minimum remuneration for domestic workers cannot be less than 75% of the monthly minimum.</li> </ul>	<p>PPP\$385.84 per month for workers aged 18 to 65.</p>
<ul style="list-style-type: none"> <li>Part-time workers receive a pro rata minimum wage according to the hours effectively worked.</li> </ul>	<p>PPP\$483.15 per month.</p>

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Costa Rica	The National Wage Council sets minimum wages by sector and occupation for workers in the private sector through executive decrees. The council’s proposal for adjustments is sent every year to the Ministry of Labor for comment, and the final decision is made by the council. In addition, minimum wages can be revised at any time during the year at the request of 5 employers or 15 workers.	General rates tend to apply to workers in occupations requiring a professional qualification and vary according to qualification. Sectoral rates are set for nonqualified, partially qualified, and specialist workers. Occupational rates are defined by the National Wage Council in its “Occupational Profiles.”
Cuba	Minimum wages are set by the Council of Ministers in consultation with the central union of workers.	All workers are covered by minimum wage legislation.
Dominican Republic	Minimum wages for private sector workers are set by occupation and sector by the National Salary Committee, which adjusts minimum wages at least every two years. In principle, the minimum wages cannot be changed within the first year of validity. However, if the employers or the workers prove that a certain minimum wage rate impairs one of the social partners and causes detriment to the national economy, the committee may adjust the rate. The minimum wage for public sector workers is set directly by executive decree.	Minimum wages are set by occupation and sector.
Ecuador	The government, through the National Wage Council, sets minimum wages for workers in the private sector and the general “vital” minimum wage rate, which is used as a reference point for calculating fines, taxes, fees, and so on. The National Wage Council is a tripartite institution made up of three representatives: one each from government, employers, and workers. In case the National Wage Council cannot reach a consensus, the Ministry of Labor sets the minimum wage rates. Minimum wages are updated yearly.	Minimum wage rates apply to all workers in the private sector and are set by sector and occupation.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>• Rates vary by sector and occupation.</li> <li>• Minimum wage rates for youth are no less than 50% of the relevant minimum wage rate during the first year of employment and no less than 75% during the second year.</li> <li>• Workers carrying out dangerous or unhealthy work are entitled to an hourly minimum wage equivalent to one-sixth of the daily minimum wage for nonqualified workers set by sector.</li> <li>• Piece-rate workers cannot be paid less than what a worker would have received if working an ordinary working day.</li> </ul>	<p>PPP\$345.35 per month for domestic workers. PPP\$19.92 per day for nonqualified workers in the agricultural, fishing, forestry, and mining industries, or the electricity, commerce, tourism, services, transport, and warehousing sectors.</p>
<ul style="list-style-type: none"> <li>• Minimum wage rates vary by sector and by occupation. They are set for laborers, administrative and service workers, technicians, and managers.</li> <li>• The minimum wage for part-time workers is proportional to the time worked.</li> <li>• A minimum wage rate is set for the agricultural sector.</li> </ul>	<p>PPP\$7.40 per day for workers in the sugar industry. PPP\$587.38 per month for workers in large industrial, commercial, or service companies.</p>
<ul style="list-style-type: none"> <li>• Minimum wages are set for workers operating heavy machinery, electricians, painters, carpenters, and plumbers.</li> <li>• Minimum wages are set for agriculture; hotels, restaurants, bars, cafes and other food service establishments; the construction industry; the sugar industry; and sectors that do not have a specific rate. In certain sectors, minimum wage rates depend on the size of a company and the nature of the business.</li> <li>• Minimum wage rates are set in accordance with production for the following occupations: carpenters, electricians, plumbers, painters, bricklayers, and heavy-machine operators in agriculture.</li> <li>• Minimum wages for part-time workers shall be calculated on a pro rata basis.</li> <li>• The remuneration for apprentices cannot be less than the minimum wage and should be calculated according to the hours of training.</li> </ul>	<p>PPP\$90.79 per month for domestic workers. PPP\$256.11 per month for workers in the small-scale industry sector, agricultural sector, and other general workers.</p>

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
El Salvador	Minimum wage rates are set by the government for certain sectors following proposals of the National Minimum Wage Council. The executive has the discretion to accept the proposals and set the rates by decree or direct the council to reconsider. The wages are adjusted at least every three years.	Minimum wage rates apply to selected sectors.
Guatemala	Minimum wage rates for private sector workers are set as follows. Joint minimum wage boards in each region and economic zone make recommendations to the National Wage Commission, a technical and advisory body attached to the Ministry of Labor and Social Welfare. The commission issues a report harmonizing all the proposed rates. Finally, the executive sets the rates (which apply nationwide with no regional variation) with the Ministry of Labor and Social Welfare. Rates are adjusted every year.	Minimum wage rates are set by sector and occupation, and rates apply to all workers except those employed by the state.
Haiti	The minimum wage is set by the government. In 1995, the Committee for Consultation and Arbitration was established to make recommendations concerning the minimum wage. The minimum wage is supposed to be adjusted for changes in the cost of living and must be increased when the annual inflation rate is more than 10%.	The national statutory minimum wage applies to all workers in commercial, industrial, and agricultural establishments. Domestic workers are not covered.
Honduras	The National Minimum Wage Commission sets minimum wages by sector. This tripartite institution comprises government, employer, and employee representatives. If it does not reach a consensus, the executive has the authority to increase the minimum wage. Minimum wages are adjusted each year. At the request of employers or workers, they can also be revised every six months if inflation is more than 12%.	All workers in the private sector are covered by minimum wage legislation except for apprentices. Minimum wages vary according to sector, the type of business concerned, and the number of employees.



**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Mexico	Minimum wage rates are set by the National Commission on Minimum Wages, a tripartite institution made up of representatives of the government, employers, and workers. Special boards may be appointed to provide advice to the commission. Minimum wages are adjusted each year and can be revised at any time if economic circumstances so warrant.	There are two types of minimum wage: the general minimum wages that apply to all workers and occupational minimum wages (higher than the general minimum wages). Both wages vary by geographic area. The legislation applies to private sector workers.
Nicaragua	Minimum wages are set by the National Minimum Wage Commission, which comprises representatives of the Ministries of Labor and of the Economy and Development, major national employer associations, and trade unions. The wages are supposed to be adjusted every six months.	Workers in both the private and public sector are covered by minimum wage legislation. There is no general minimum wage rate, but, rather, minimum wage rates that vary by sector.
Panama	Minimum wages are set by executive decree following recommendations of the National Minimum Wage Commission, a tripartite institution comprising worker, employer, and government representatives. Minimum wages are supposed to be adjusted at least every two years.	The legislation covers only workers in the private sector. There is no general minimum wage rate. Minimum wage rates vary according to regions, sectors, and company size. A worker providing services in more than one area receives the most favorable rate.
Paraguay	Minimum wages are set by the government according to proposals of the National Minimum Wage Council, a tripartite institution made up of government, employer, and worker representatives. The rates are supposed to be updated every two years. The government may change the rates earlier if there is a significant alteration in the conditions of a sector or industry or if there is a variation of at least 10% in the cost of living.	Minimum wage legislation applies to all workers in the private sector. Minimum wages are set by occupation and by sector. There is also a minimum wage rate applicable to those occupations and sectors that do not have a specific minimum wage rate.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>There are 88 occupational minimum wages set for occupations such as bricklayers, archive workers, drugstore salespersons, cashiers, bartenders, carpenters, brush operators, chefs, mattress producers, accountants, shoemakers, tailors, car drivers, bus drivers, truck drivers, furniture restorers, electricians, supermarket workers, nurses, gas station workers, locksmiths, and jewelers.</li> </ul>	PPP\$5.83 per day for area C. PPP\$6.27 per day for area A.
<ul style="list-style-type: none"> <li>Rates have been established for the following sectors: agriculture; fishing; mining; manufacturing; some industries; electricity, gas, and water; construction; commerce, the restaurant and hotel industry; transport, warehousing, communication; financial and insurance services; and central and local government.</li> <li>Minimum wages for prison workers cannot be lower than the regular applicable minimum wage.</li> </ul>	PPP\$129.50 per month for agricultural workers. PPP\$304.77 per month for construction workers.
<ul style="list-style-type: none"> <li>Rates are set for domestic workers, wood producers, furniture and mattress producers, food producers, personal services providers, and air and water transportation workers.</li> <li>Rates are set for agriculture, forestry, hunting, fishing, the manufacturing sector, electricity, gas, water, construction, large- and small-scale commerce, hotels, restaurants, transport, warehousing, telecommunications, financial intermediaries, real estate, and social and personal services.</li> </ul>	PPP\$1.84 per hour for agricultural workers in small-scale companies.
<ul style="list-style-type: none"> <li>Apprentice remuneration may not be less than 60% of the minimum wage.</li> <li>The remuneration of minors may not be less than 60% of the minimum wage and a progressive scale based on years effectively worked. A minor performing the same work as an adult must be paid the full minimum wage.</li> <li>Remuneration for physically and mentally disabled persons can be lower than the minimum wage.</li> <li>The daily minimum wage for piece-rate workers shall not be lower than the monthly minimum wage divided by 26.</li> </ul>	The minimum wage rate applicable to those occupations and sectors that do not have specific minimum wage rates is PPP\$694.03 per month.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Peru	The minimum wage is set by the National Labor and Employment Promotion Council, a tripartite institution made up of government, worker, and employer representatives. If there is no agreement on a minimum wage rate within the council, the president sets the minimum wage through emergency decree.	All workers in the private sector are covered by minimum wage legislation. There is one general minimum wage rate applicable to all workers in the private sector.
Trinidad and Tobago	The government sets the minimum wage in an order based on the recommendation of the Minimum Wages Board.	The order does not apply to trainees in government-approved training schools, registered apprentices, workers in certain government-approved schemes, students on vacation jobs, and volunteers in registered charities.
Uruguay	The government sets the national minimum wage by decree.	The national minimum wage applies to the public and private sectors. There are three minimum wage rates: general, for rural workers, and for domestic workers.
Venezuela	The Ministry of Labor sets minimum wages based on recommendations by the Tripartite Commission for the Revision of the Minimum Wage. In the absence of a recommendation, the executive may unilaterally set the rates. In case of large increases in the cost of living, the executive may set rates by decree, taking into account comments of worker and employer representatives, the National Economic Council, and the Central Bank. Rates are adjusted yearly.	Minimum wages apply to both private and public sector workers. There is no general minimum wage rate. There are different minimum wage rates for: urban workers, workers in companies with fewer than 20 workers, rural workers, and youth and apprentices.
<i>Middle East and North Africa</i>		
Algeria	In accordance with the law on labor relations, the government sets a national minimum wage following consultation with social partners.	All workers, except national defense personnel, magistrates, state officials, and personnel of selected public establishments. Legislation may be enacted for managers, journalists, pilots, captains, seafarers, home workers, artists, commercial representatives, athletes, and domestic workers.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>Remuneration for youth, trainees, and apprentices cannot be lower than the minimum wage. If they work less than a full working day, the remuneration should be set on a pro rata basis.</li> </ul>	PPP\$309.94 per month.
<ul style="list-style-type: none"> <li>Piece-rate workers and offsite workers must be paid an agreed piece-rate or an hourly rate based on a fair estimate of the equivalent number of hours and on the minimum wage.</li> </ul>	PPP\$282.62 per month.
<ul style="list-style-type: none"> <li>Minimum wage rates for domestic workers vary by region.</li> <li>Minimum wage rates for agricultural laborers vary by occupation.</li> </ul>	PPP\$110.19 per month.
<ul style="list-style-type: none"> <li>The minimum wage rate applicable to workers in companies with fewer than 20 workers is also applicable to domestic workers.</li> <li>If apprentices and youth render services under the same conditions as urban or rural workers, the regular minimum wage rates apply.</li> </ul>	PPP\$265.84 per month for rural workers. PPP\$295.37 per month for urban workers.
<ul style="list-style-type: none"> <li>Apprentices receive a presalary equivalent to 15% of the national rate for six months (if the apprenticeship stays less than 24 months) or for 12 months (if the apprenticeship stays more than 24 months).</li> <li>Wages for home workers may not be lower than the national minimum wage rate.</li> </ul>	PPP\$389.41 per month.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
Lebanon	The national minimum wage rate is set by the government in accordance with a report of the tripartite Commission on the Cost of Living Index, comprising representatives of the government, employers, wage earners, and salaried earners.	The minimum wage applies to all workers over 20 years of age in the public and private sector except for domestic servants, workers in agricultural corporations not connected to trade and industry, workers in family businesses, and temporary workers in public administration.
Morocco	National minimum wage rates are set by the government following consultation with the most representative employee and employer organizations.	Rates are set for agricultural workers, industrial and commercial workers, and the liberal professions. Certain categories of employers may be excluded from the legislation following consultation with employee and employer organizations.
Tunisia	Minimum wage rates are set and revised by the government in a decree following consultations with worker and employer organizations. In practice, the National Committee on Social Dialogue is consulted. The legislation does not set forth how frequently rates should be adjusted, but, in practice, they are updated each year.	Rates are set for agricultural workers and other workers. The Labor Code applies to all public and private employers, including cottage industries, cooperatives, professionals, unions, and other organizations. It excludes domestic workers.
<i>South Asia</i> Bangladesh	The Minimum Wages Board may recommend the minimum wage rates for workers in industries. The Council of Minimum Wages and Prices for Agricultural Labor may recommend the minimum wage rate for agricultural laborers (the council has not yet been established). The Export Processing Zones Authority establishes separate minimum wage rate for companies within export processing zones. The Minimum Wages Board should review any recommendations at least once during any three-year period.	Minimum wage rates have been established for workers in the garment industry, export processing zones, and agriculture. Persons employed by federal or provincial governments are excluded from minimum wage rates set in wage board ordinances for workers in industries.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
	PPP\$239.00 per month.
<ul style="list-style-type: none"> <li>• Apprentices may be paid wages lower than the minimum rates.</li> <li>• Employees paid by the piece, output, or production must receive a salary equivalent to the minimum rate unless output is reduced as a result of factors within the control of the employee concerned.</li> <li>• Employees whose salaries are made up entirely of tips or tips and a base salary are entitled to receive at least the minimum wage rate. If the tips are not sufficient, the employer must pay the difference.</li> </ul>	PPP\$14.18 per day for agricultural workers.
<ul style="list-style-type: none"> <li>• A minimum wage rate is set for workers under 18 years of age; this is currently at 85% of the relevant adult rate.</li> <li>• Wage rates for workers paid per piece produced must be set at the equivalent of the minimum wage rate.</li> </ul>	PPP\$14.58 per day for agricultural workers. PPP\$411.97 per week for nonagricultural workers.
<ul style="list-style-type: none"> <li>• Apprentices have a slightly lower minimum wage rate than regular workers in export processing zones. Separate wage rates are also set for trainees or apprentices in the garment industry.</li> </ul>	PPP\$49.23 per month for helpers in the garment industry. PPP\$73.84 per month for machine operators in the garment industry. PPP\$148.91 per month for helpers in export processing zones. PPP\$248.18 per month for ordinary operators in electronics industries in export processing zones.

(continued)

**TABLE 3A.1. Characteristics of the Minimum Wage in Selected Countries (Continued)**

<i>Country</i>	<i>Minimum wage–setting procedure</i>	<i>Coverage: scope</i>
India	Minimum wage rates for occupations that are largely nonunionized or have little bargaining power may be set in accordance with the Minimum Wages Act, 1948. Both central and local governments may set minimum wage rates for nonunionized occupations. Reviews of the rates should take place at least every five years.	The law applies throughout India except in Sikkim. The central government sets rates for 45 different occupations, while states have set rates for 1,232 occupations in their jurisdictions. The law does not apply to organized occupations or to family members employing other members who live with and depend on them.
Nepal	The government sets minimum wage rates on the basis of recommendations by the Minimum Remuneration Fixation Committee (nonagriculture) and the High Level Monitoring Committee (agriculture). In the absence of recommendations, the government may prescribe the rates.	Minimum wage rates are set for all agricultural workers and for nonagricultural workers in enterprises with more than 10 workers (for unskilled, semiskilled, skilled, and highly skilled workers). Domestic workers are excluded from the provisions.
Pakistan	The government sets a minimum wage rate. Provincial minimum wage boards may recommend minimum wage rates that the provincial governments should adopt for unskilled and juvenile workers (not done in practice) and for skilled workers in industries without effective collective bargaining mechanisms (done in a few regions). The minimum wages boards should review recommendations not less than every three years.	The legislation applies to all unskilled workers in commercial and industrial establishments (all sectors). It does not apply to workers in agriculture, federal or provincial governments, coal mines, public utilities, defense, or public services.
Sri Lanka	Minimum wage rates are set by wage boards for 39 trades and by the Remuneration Tribunal for shop and office employees. The legislation does not provide specific dates when minimum wage rates should be adjusted.	Any person working in a trade for which no wages boards or remuneration committees have been established is excluded from the national system of minimum wage. The legislation makes no provision for domestic workers or for workers in the fishing sector.

## Annex 1: Characteristics of the Minimum Wage in Selected Countries

Coverage: variations in minimum wage, by categories	Level(s) <sup>a</sup>
<ul style="list-style-type: none"> <li>The regional minimum wage rates should not be less than the minimum floor wage set by the minister of labor.</li> <li>Specific minimum wage rates may be established for apprentices, adolescents (14 to 18 years of age), and children under 14.</li> <li>The appropriate government may exclude disabled employees from certain provisions of the legislation.</li> </ul>	<p>PPP\$5.85 per day for unskilled construction workers in most rural areas.</p> <p>PPP\$10.43 per day for unskilled agricultural workers in some areas.</p>
<ul style="list-style-type: none"> <li>A lower rate is set for workers between 14 and 16 years of age.</li> </ul>	<p>PPP\$133.94 per month for unskilled workers on tea estates.</p> <p>PPP\$197.3 per month for workers and employees not working on tea estates.</p>
<ul style="list-style-type: none"> <li>Apprentices are excluded from the legislation, but the apprenticeship rules provide that apprentices receive a guaranteed rate that starts at 50% of the regular rate in the first year and increases up to the regular rate after three years.</li> </ul>	<p>PPP\$182.08 per month.</p>
<ul style="list-style-type: none"> <li>Minimum wage rates may vary in accordance with a worker's skill level.</li> <li>Lower minimum wage rates than those set for adults have been established for apprentices, trainees, and learners in selected trades.</li> <li>Many wage boards set lower minimum wage rates for children.</li> <li>Disabled workers may be granted reduced minimum rates.</li> <li>Wage boards may determine minimum wage rates for piece work.</li> </ul>	<p>PPP\$3.85 per day for rubber workers.</p> <p>PPP\$50.70 per month for preschool assistants.</p> <p>PPP\$128.98 per month for textile workers.</p>

Source: Conditions of Work and Employment Database. International Labor Organization. <http://www.ilo.org/travaildatabase/servlet/minimumwages> (accessed November 23, 2005).

<sup>a</sup> Most minimum wage rates are expressed here in terms of purchasing power using the purchasing power parity (PPP) factors elaborated by the World Bank for 2003. Where values in PPP dollars (PPP\$) are not available, minimum wage rates have been converted to United States dollars (US\$) using the average exchange rate for 2003 (Source: Economic Intelligence Unit). When there are multiple rates, the table typically presents the lowest and highest rates.



ANNEX

2

International Comparisons of  
Alternative Indicators of the  
Stringency of Employment  
Protection Legislation

**TABLE 3A.2. International Comparisons of Alternative Indicators of the Stringency of Employment Protection Legislation**

<i>Region/ country</i>	<i>Difficulty of hiring index</i>	<i>Rigidity of hours index</i>	<i>Difficulty of firing index</i>	<i>Rigidity of employment index</i>	<i>Hiring cost (% of salary)</i>	<i>Firing costs (weeks of wages)</i>
<i>East Asia and the Pacific</i>						
Cambodia	67	80	30	59	0	138.8
China	11	40	40	30	30	90
Fiji	22	40	0	21	8	27.8
Hong Kong, China	0	0	0	0	5	12.9
Indonesia	61	40	70	57	10.2	144.8
Kiribati	0	0	50	17	7.5	46.4
Lao PDR	11	60	80	50	5	35.9
Malaysia	0	20	10	10	13.3	65.2
Marshall Islands	33	0	0	11	10.5	0
Micronesia	33	0	0	11	6	0
Mongolia	11	80	10	34	19	16.9
Palau	0	0	0	0	6	0
Papua New Guinea	22	20	20	21	7.7	38.4
Philippines	56	40	40	45	9.3	90
Samoa	11	20	0	10	6	42.4
Singapore	0	0	0	0	13	4
Solomon Islands	11	20	20	17	7.5	51.7
Taiwan, China	78	60	30	56	9.5	90
Thailand	33	20	0	18	5	47
Timor-Leste	67	20	50	46	0	21.2
Tonga	0	40	0	13	0	0
Vanuatu	39	40	10	30	6	55
Vietnam	44	40	70	51	17	98
<i>Europe and Central Asia</i>						
Albania	44	80	20	48	30.7	63.6
Armenia	17	60	70	49	18.8	16.6
Azerbaijan	33	40	40	38	27	42.4
Belarus	0	40	40	27	39.1	20.9
Bosnia and Herzegovina	56	40	30	42	42	32.8
Bulgaria	61	60	10	44	32.2	29.8
Croatia	61	60	50	57	17.2	37.8
Czech Republic	33	20	20	24	37	21.6
Estonia	33	80	40	51	33	33.2

## Annex 2: Alternative Indicators of the Stringency of Employment Protection Legislation

<i>Region/ country</i>	<i>Difficulty of hiring index</i>	<i>Rigidity of hours index</i>	<i>Difficulty of firing index</i>	<i>Rigidity of employment index</i>	<i>Hiring cost (% of salary)</i>	<i>Firing costs (weeks of wages)</i>
Georgia	0	60	70	43	31	4
Hungary	11	80	20	37	33.5	33.5
Kazakhstan	0	60	10	23	22	8.3
Kyrgyz	33	40	40	38	26.5	20.9
Latvia	67	40	70	59	22.4	17
Lithuania	33	60	40	44	28	33.8
Macedonia, FYR	61	60	40	54	32.5	40.7
Moldova	33	100	70	68	30	20.9
Poland	11	60	40	37	25.8	24.9
Romania	67	60	50	59	34	98
Russian Federation	0	60	30	30	35.8	16.6
Serbia and Montenegro	44	0	40	28	25	21.2
Slovak Republic	17	60	40	39	35.2	12.9
Slovenia	61	80	50	64	16.6	43
Turkey	44	80	40	55	22.1	112
Ukraine	44	60	80	61	36.4	16.6
Uzbekistan	33	40	30	34	36	30.5
<i>Latin America and the Caribbean</i>						
Argentina	44	60	40	48	30.4	94
Bolivia	61	60	0	40	14	98
Brazil	67	80	20	56	26.8	165.3
Chile	33	20	20	24	3.4	51.3
Colombia	72	60	40	57	28.4	43.9
Costa Rica	56	60	0	39	23.5	33.7
Dominican Republic	22	80	30	44	13.5	76.9
Ecuador	44	60	70	58	13	131
El Salvador	44	60	20	41	15.3	86
Guatemala	61	40	20	40	12.8	100
Guyana	..	..	..	..	7.2	0
Haiti	11	40	20	24	9	25.6
Honduras	22	40	40	34	9.5	46.4
Jamaica	11	0	20	10	11.5	60.2
Mexico	33	60	60	51	23.8	74.5
Nicaragua	11	80	50	47	17	23.5

(continued)

**TABLE 3A.2. International Comparisons of Alternative Indicators of the Stringency of Employment Protection Legislation (*Continued*)**

<i>Region/ country</i>	<i>Difficulty of hiring index</i>	<i>Rigidity of hours index</i>	<i>Difficulty of firing index</i>	<i>Rigidity of employment index</i>	<i>Hiring cost (% of salary)</i>	<i>Firing costs (weeks of wages)</i>
Panama	78	40	70	63	14	47.3
Paraguay	56	60	60	59	16.5	99
Peru	44	60	40	48	10	55.6
Puerto Rico	56	20	30	35	16.2	0
Uruguay	33	60	0	31	20	25.8
Venezuela	33	80	20	44	14.7	46.4
<i>Middle East and North Africa</i>						
Algeria	44	60	50	51	27.5	16.9
Egypt	0	80	80	53	26	162.3
Iran	78	60	10	49	23	90
Iraq	78	80	50	69	12	4
Israel	0	80	20	33	5.9	90
Jordan	11	40	50	34	11	90
Kuwait	0	60	0	20	11	42.4
Lebanon	33	0	40	24	21.5	17.3
Morocco	100	40	40	60	17.7	83.3
Oman	44	60	0	35	9	12.6
Saudi Arabia	0	40	0	13	11	79.3
Syria	11	60	50	40	17	79.3
Tunisia	61	0	100	54	18.5	28.9
United Arab Emirates	0	80	20	33	12.5	95.6
West Bank and Gaza	33	60	20	38	13	90
Yemen	0	80	30	37	17	16.9
<i>South Asia</i>						
Afghanistan	67	20	30	39	0	4
Bangladesh	11	40	20	24	0	47
Bhutan	78	60	0	46	0	94
India	56	40	90	62	12.3	79
Maldives	0	20	0	7	0	20
Nepal	22	20	90	44	0	90
Pakistan	67	40	30	46	12	90
Sri Lanka	0	40	80	40	16.3	175.7
<i>Sub-Saharan Africa</i>						
Angola	33	80	80	64	8	61.8
Benin	39	80	40	53	27.4	35.2
Botswana	11	40	40	30	0	18.9

## Annex 2: Alternative Indicators of the Stringency of Employment Protection Legislation

<i>Region/ country</i>	<i>Difficulty of hiring index</i>	<i>Rigidity of hours index</i>	<i>Difficulty of firing index</i>	<i>Rigidity of employment index</i>	<i>Hiring cost (% of salary)</i>	<i>Firing costs (weeks of wages)</i>
Burkina Faso	83	100	70	84	22.5	57
Burundi	67	80	60	69	6.9	24.9
Cameroon	28	60	80	56	15.5	40
Central African Republic	89	80	60	76	18	37.2
Chad	67	80	70	72	21.2	20.6
Congo, Democratic Republic	100	100	70	90	9	30.8
Congo, Republic	89	80	70	80	16.1	41.5
Côte d'Ivoire	44	80	10	45	15.4	67.6
Eritrea	0	60	20	27	2	68.5
Ethiopia	33	60	30	41	0	40.2
Ghana	11	40	50	34	12.5	24.9
Guinea	33	80	30	48	27	25.5
Kenya	33	20	30	28	5	47
Lesotho	56	60	10	42	0	47
Madagascar	67	60	50	59	18	40.9
Malawi	22	20	20	21	1	90
Mali	78	60	60	66	23.9	80.8
Mauritania	100	60	60	73	17	30.9
Mauritius	0	60	50	37	7	15.2
Mozambique	83	80	20	61	4	141
Namibia	0	60	20	27	0.1	24.2
Niger	100	100	70	90	16.4	75.6
Nigeria	33	60	20	38	7.5	4
Rwanda	56	60	60	59	8	53.8
São Tomé and Príncipe	61	60	60	60	6	108
Senegal	61	60	70	64	23	38.3
Sierra Leone	89	80	70	80	10	188.3
South Africa	56	40	60	52	2.6	37.5
Sudan	0	60	70	43	19	36.9
Tanzania	67	80	60	69	16	38.4
Togo	78	80	80	79	25	66.3
Uganda	0	20	20	13	10	12
Zambia	0	20	10	10	9	176
Zimbabwe	11	40	20	24	6	29.2

Source: Doing Business Database. World Bank. <http://www.doingbusiness.org/> (accessed November 30, 2005).





“Better Policies” Series

# SLOVENIA

## THE GROWTH EFFECTS OF STRUCTURAL REFORM

MAY 2015



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## Slovenia: The growth effects of structural reform

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## Key findings

To improve Slovenia's long-term growth prospects and support job creation, comprehensive structural reforms are needed to boost competitiveness, in particular by addressing the country's productivity gap with other OECD countries. Slovenia has implemented many reforms in recent years, including of the pension system and labour and product markets. Other reforms such as the restructuring and recapitalisation of banks, the initiation of privatisations, and changes to the fiscal framework have been legislated and are ongoing, and their full implementation will support growth further going forward.

Drawing on the 2015 OECD Economic Survey of Slovenia, this paper provides a snapshot at the pension, product markets, and labour market reforms that have been implemented or approved and assesses their impact on productivity, employment and GDP. After five years, GDP will be 1% higher than would otherwise be the case in the absence of the reforms. This means that GDP will grow 0.2% faster per year on average over this period thanks to the reforms. In the following five years a further gain of similar magnitude can be expected. These estimates assume swift and full implementation of the reforms - delays, or less than full implementation, would reduce the gains.

- The *product market reforms* are estimated to boost GDP by around 0.7% after five years and 1.3% after ten years. This is driven by higher productivity growth as lighter regulation due to simpler rules on opening a business, reduced administrative burdens, and lower state-control encourage competition. This in turn speeds up the pace of convergence in productivity levels to the most technologically advanced economies. Lighter regulation also encourages firms to produce new ideas and technologies and facilitates the shift of resources from slow- to fast-growing sectors.
- The 2013 *labour market reform* is expected to boost GDP by 0.2% after five years and 0.3% after ten years. The positive GDP effect comes through higher productivity growth via increased flexibility of the labour market. Next to enhanced flexibility, the labour market reform also reduced duality between permanent and fixed-term contracts. This is a positive step, since labour market duality reduces firms' ability to adapt to shocks and unfairly distributes the burden of workforce adjustments towards vulnerable groups.
- The 2013 *pension reform* is expected to boost GDP by 0.1% after five years and 0.4% after ten years. The positive GDP effect comes through higher employment via increased incentives for older people to stay in the labour market. By increasing the statutory and minimum retirement ages and reducing the implicit tax on continued work for older people, the reform also made the pension system more sustainable.

## Quantifying the effects of the reforms: details and analyses

The Slovenian government has implemented a number of important structural reforms in recent years to boost growth. This paper provides an estimate of the impact of the product and labour market reforms as well as of the pension reform on productivity, employment and GDP. The assessment suggests that the reforms could increase the level of GDP by 1% within the first five years following the reform and by 2% within the first ten years (Table 1). At the 10-year horizon, about 20% of the effect is due to higher employment, while the remaining part is due to higher productivity. Details on the reforms that are taken into account in the analysis are found in the Annex.

**Table 1. The impact of recent structural reforms on GDP over 5 and 10 years**

	in percent		
	GDP	Via Employment growth	Via Productivity growth
<b>Impact after 5 years</b>			
Product Market Reform	0.7		0.7
Labour Market Reform	0.2		0.2
Pension reform	0.1	0.1	
<i>Total</i>	<i>1.0</i>	<i>0.1</i>	<i>0.9</i>
<b>Impact after 10 years</b>			
Product Market Reform	1.3		1.3
Labour Market Reform	0.3		0.3
Pension reform	0.4	0.4	
<i>Total</i>	<i>2.0</i>	<i>0.4</i>	<i>1.6</i>

1. OECD estimates for the impact of product market reform include changes to the product market regulation (PMR) as captured by the change in the OECD PMR indicator between 2008-2013, announced privatisations and reforms via EU commitments. The 2008-2013 change in the PMR is assumed to start having an effect on growth two years before other reforms.
2. Impact on the labour market reform is assessed via the effect of the change in the employment protection legislation (EPL) on growth.
3. Effect of the pension reform is based on a judgement and assesses the effect on employment via increased incentives for older people to stay in the labour market.

*Source: OECD calculations.*

The quantitative assessment accounts for two types of reforms (1) past reforms which have already been implemented and (2) additional measures which have been announced and approved by the parliament.

The quantitative assessment adopts the same methodology to estimate the effects of structural reforms as the OECD uses for the assessment of G20 countries' reform commitments in the Brisbane Action Plan. First, each reform measure is evaluated in terms of quantifiable variables, including standard OECD indicators where necessary. These indicators are typically the Product Market Regulation (PMR) indicators and the Employment Protection Legislation (EPL) indicators. Then a series of equations relate each reform measure to their expected effects on productivity and/or employment. The simulation results for Slovenia are obtained assuming that the structure of the economy corresponds to the average of France, Italy and Spain.

The quantitative assessment primarily focuses on reform measures for which the estimated effects are relatively well-established and straightforward to be understood. It relies on existing OECD empirical studies of the links between structural policies and productivity or employment, and covers the following areas: *i*) product market reform, *ii*) labour market reform (reform of employment protection legislation) and *iii*) pension reform.

## Product market reform

By spurring competition product market reform can accelerate the convergence in productivity levels to the most technologically advanced economies. Stronger competition encourages firms to become more efficient and to invest in innovation and knowledge-based capital. It also increases growth and employment by encouraging the creation of new companies – through lower barriers to entrepreneurship – and the expansion of existing ones that can take advantage of new markets, products or processes. Product market reforms can also boost aggregate productivity by enhancing the country's capacity to re-allocate capital and labour from declining or slow-growing to fast-growing sectors.

Slovenia's overall regulatory framework is among the most restrictive in the OECD, which stems largely from the pervasive state involvement in the economy. But there is also room to reduce the complexity of regulatory procedures and administrative burdens imposed on new companies. To tackle these issues, a number of reforms to the business environment have been implemented. Specifically, between 2008 and 2013, the government introduced simpler rules on starting a business, reduced administrative burdens on new companies and sole proprietors and established single contact points for getting information on all notifications and licenses. Additionally, the parliament approved a list of 15 companies to be privatised and the government committed to privatising state-owned banks. By early 2015 five companies were privatised and the remaining ones are in the process of being privatised. Slovenia also has to implement reforms as part of the completion of the European Telecom Single Market, the Third EU Energy Package and the EU's commitment to open the railway market for competition.

Together, the already implemented product market reforms and those to which Slovenia is committed should boost productivity and GDP by around 0.7% within the first five years after the reforms and by another 0.6% within the following five years.

The Slovenian government has also implemented a number of growth-enhancing product market reforms that cannot be quantified within the OECD's framework. Examples are the 2013 improvements in insolvency procedures, which should facilitate the restructuring of companies, and the establishment of the Slovenian Sovereign Holding (SSH) in April 2014, which should improve the management of the state-owned assets and improve corporate governance.

## Labour market reform

Reforms that reduce the stringency of employment protection legislation (EPL) and reduce the costs of hiring and firing can support growth by facilitating the allocation of labour resources. They make it easier for firms to respond quickly to changes in demand or technological advancements that require the reallocation or downsizing of staff. A study by Bassanini et al. (2009) supports this view, showing that stringent EPL weakens productivity in sectors where labour turnover is "naturally" high.

Before the 2013 labour reform, Slovenia was among the OECD countries with the strongest protection of workers on permanent contracts and no direct costs for terminating fixed-term contracts. The aim of the reform was to increase labour market flexibility and decrease labour market duality. The reform introduced greater flexibility by simplifying administrative procedures related to hiring and firing and shortening notice periods and lowered the costs of permanent employment contracts by reducing severance payments. For fixed-term contracts, it introduced redundancy payments and limited to two years the maximum duration of a fixed-term employment for a given job. In the case of termination, employers' costs are now the same for both contract types.

According to a survey by the Bank of Slovenia (2014) only 14% of companies reported a change in their human resources policy due to the new legislation. Still, evidence points, however, to a slight reduction in labour market duality as the share of permanent contracts among new hires increased from 24% to 28% within a year (IMAD, 2014). The OECD framework estimates the productivity and GDP effects of reduced protection of individuals with permanent contracts at 0.2% in the first five years after the reform. In the following five years a somewhat smaller effect is expected, so that the total GDP and productivity effects after ten years amount to around 0.3%.

The OECD framework does not allow quantifying the reform of student work that came into force in February 2015. Student work had been a major factor behind labour market duality, as it benefited from a preferential tax and regulatory treatment. The very welcome reform introduced a minimum hourly gross wage rate for student work, together with healthcare and pension contributions. Students will now accumulate years of pensionable service from their work. These changes make student work more comparable to regular employment contracts regarding costs, while maintaining its greater flexibility.

### Pension reform

A pension reform that increases older people's incentives to stay in the labour market, for instance by reducing the implicit tax on continued work or raising the statutory retirement ages, should have a positive effect on employment and, via better labour utilisation, on GDP.

The pension reform that Slovenia launched in 2013 strengthened the link between contributions paid and pensions received and equalised the statutory retirement age for men and women – for both genders the statutory retirement age will be gradually raised to 65 years by 2020. The reform increased penalties for early retirement (the pension is reduced by 0.3% per month of retirement before the statutory retirement age) and introduced a bonus for continued work (the pension is increased by 1% for every three-month period of work beyond the statutory retirement age with a maximum bonus of 12%). The new measures have helped slowing down the inflow of new applicants into the pension system (MDDSZ, 2014), though this has to be seen in the context of a strong inflow into the pension system just before the reform became effective.

OECD estimates suggest that the pension reform will boost GDP by 0.1% in the first five years after the reform and by another 0.3% within the following five years. This GDP effect comes through a rise in employment, which will increase by 0.2% within the first 5 years of the reform and another 0.2% within the following 5 years. The contribution of employment to GDP growth is disproportionately larger at the 10-year horizon despite the similar pace of employment growth because the 10-year effect assumes that the capital stock increases by as much as employment to recover the pre-reform level of the return to capital.

### Changes in the fiscal and banking framework

The Slovenian government has also introduced a number of changes to the fiscal and banking framework, which could not be quantified within the OECD's framework. Nonetheless, these changes can be expected to contribute positively to economic growth and stability in Slovenia. The reforms to the fiscal framework are expected to limit public expenditure growth in the future via a fiscal rule that requires a balanced budget over the medium term and to improve the collection of revenues via measures countering tax evasion. This is expected to lower public debt and free resources for more growth-friendly spending.

The measures in the banking sector should have helped to restore confidence and bring interest rates on public debt down to more sustainable levels. The weakened banking system was recapitalised and some non-performing assets were transferred to the newly established Bank Asset Management Company (BAMC). BAMC has the power to seek a quick resolution of impaired assets. Additionally, bank supervision is being strengthened. The National Assembly passed a law establishing a bank resolution fund, which will become operational in 2015 and will be financed by banks and managed by the central bank. In addition, a macro-prudential institutional framework has been established by the Bank of Slovenia.

## Annex: Reforms taken into account in the quantification exercise

Reform area	Reform content
<b>Product market reform</b>	
Various product market reforms during 2008-13	Reforms include improvements in the governance of state-owned assets, reductions in the government's involvement in network sectors, a shortening of the number of days required to open up a business, the introduction of single contact points for getting information on all notifications and licenses to open up a business, and the simplification of regulatory procedures and administrative burdens on start-ups and sole proprietors.
Privatisation	The parliament approved a list of 15 companies to be privatised. By early 2015 five companies had been privatised and the remaining ones are in the process of being privatised. The government has also committed to privatise state-owned banks.
EU commitment on Single Telecom Market	A legislative package for the completion of the European Telecom Single Market was voted by the European Parliament in April 2014 and has to be approved by the EU Council. The proposed package would strengthen network neutrality rules across borders and cut international roaming charges in the EU. Following an agreement reached with the EP in February 2014, the Council adopted the Directive on broadband cost reduction on 8 May. EU Member States must now adopt national provisions to comply with the new Directive by 1 January 2016 and they must apply the new measures from 1 July 2016.
EU commitment in the energy sector	In the energy sector the priority for the coming years should be the completion of the energy internal market through the transposition and implementation of the Third Energy Package, which should be achieved by the end of 2014. Its major elements concern the unbundling of networks, the strengthening of the independence and power of national regulators, and the improvement of the functioning of retail markets.
EU commitment in transport	In transport, the main priority is the opening of the railway market for competition through, among other things, the separation between infrastructure and services and open procedures for public service obligations. These issues are addressed by the Fourth Railway package proposed by the European Commission. In June 2014, the Council reached political agreement on the draft directives on the interoperability and safety of European railways and the draft regulation on the European Railway Agency. Together, these three legislative acts make up the technical pillar of the Fourth Railway package.
<b>Labour market reform</b>	
Employment Protection Legislation	Several measures to increase labour market flexibility and reduce segmentation were implemented in April 2013: reduced notice periods and severance payments for permanent employees, introduction of severance payments for temporary contracts, simplification of administrative procedures related to hiring and firing, introduction of quotas to agency workers.

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**Pension reform**

Retirement age	The retirement age is being equalised for men and women and will be gradually raised to 65 years by 2020. Under the previous system, men could retire at 63 and women at 61. Also, the age at which a person may retire at a full pension if he/she has 40 years of actual employment (or periods for which contributions were paid with regard to maternity, sick leave or unemployment) was raised from 58 to 60.
Early and deferred retirement	The reform increased penalties for early retirement and increased rewards for continued work. In case of early retirement, the pension is reduced by 0.3% per month of retirement before the statutory retirement age. Conversely, a bonus is provided for deferred retirement, with the pension being increased by 1% for every three-month period of work beyond the statutory retirement age. The maximum pension bonus a person can obtain is limited to 12%.
Pension base	The calculation of the pension base takes into account the 24 consecutive years of insurance that are most favourable for the individual, as opposed to the 18 years under previous system.

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# THE 2012 LABOUR MARKET REFORM IN SPAIN: A PRELIMINARY ASSESSMENT

December 2013



**THE 2012 LABOUR MARKET REFORM IN SPAIN:  
A PRELIMINARY ASSESSMENT**

**DECEMBER 2013**





## FOREWORD

This report provides an initial evaluation of the comprehensive reform of the Spanish labour market undertaken in 2012. The report was commissioned to the OECD by the Spanish government and it complements the evaluation of the 2012 labour market reform undertaken by the Labour Ministry (Ministerio de Empleo y Seguridad Social (MEySS)) and presented in September 2013.

The evaluation presented in this report should be considered preliminary and mainly confined to the short-time impact of the reform, given the fact that only a short amount of time has passed since the reform was undertaken and the complexity of assessing the impact of such a comprehensive reform.

The objective of this report is to describe the key components of the 2012 reform and place them in the context of the evolution of labour market institutions in other OECD member countries, with a particular focus on collective bargaining and employment protection legislation. The report also assesses the impact of the reform on the ability of firms to adjust wages and working time to cope with demand shocks (so-called internal flexibility), as well as the flows in the labour market for different types of contracts and the overall duality of the Spanish labour market. The report also considers what complementary reforms would be required to improve the effectiveness of the labour market reform, in particular in the area of active labour market policies.

The work on this report was carried out by the Directorate for Employment, Labour and Social Affairs (ELS) of the OECD. The report was prepared by Andrea Bassanini and Josep Mestres, with statistical assistance from Thomas Manfredi. It benefited from the many useful comments by Stefano Scarpetta (ELS Director), Mark Keese (Head of the Employment Analysis and Policy Division) as well as by staff in the OECD Economics Department.

The co-operation of Spanish Authorities in providing the data used in this report is gratefully acknowledged. José Ignacio García Perez kindly performed the estimations of competing-risk hazard models on social security data. Moreover, staff in the Spanish Labour Ministry provided useful comments on previous drafts. Nonetheless, the OECD Secretariat bears full and sole responsibility for this report.

This work is published on the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Organisation or of the governments of its member countries.



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## EXECUTIVE SUMMARY

This report provides an initial evaluation of the impact of the comprehensive reform of the Spanish labour market undertaken in 2012. This assessment is complementary to the evaluation performed by the *Ministerio de Empleo y Seguridad Social* (2013). Nonetheless, the findings presented here should be considered as preliminary, given the short amount of time that has elapsed since the reform was introduced and the complexity of assessing the impact of such an extensive reform.

### ***The reform has promoted the internal flexibility of firms...***

One of the key elements of the reform is the greater priority given to collective bargaining agreements at the firm level over those at the sectoral or regional level and the greater possibility given to firms to opt-out from a collective agreement and adopt internal flexibility measures to limit job destruction. In addition, the extension of collective bargaining agreements after their end date if no new agreement is reached is now limited to a maximum period of one year. Dismissal regulations have also been modified, redefining the conditions for fair dismissal, reducing monetary compensations in the case of unfair dismissal and eliminating the requirement of administrative authorisation in the case of collective redundancies. Moreover, a new permanent contract for full-time employees in small firms has been introduced with an extended trial period of one year.

### ***...and reduced dismissal costs for permanent workers***

The labour market reform has improved the *de jure* flexibility of the collective bargaining system in a way rarely found before the crisis both in Spain and in other countries of the Euro area. OECD indicators on employment protection legislation (EPL) indicate that the reform has significantly reduced the rigidity of the Spanish legislation on dismissals. Nevertheless, severance pay for permanent workers in Spain remains among the highest in OECD countries, despite the significant reduction in compensation for unfair dismissal brought about by the reform.

### ***The reform has contributed to significant wage moderation...***

The changes of internal-flexibility and collective-bargaining regulations have contributed to the significant wage moderation observed in Spain over the past year, even if part of this moderation is the result of protracted adverse cyclical conditions and public-sector wage cuts. While this wage moderation is affecting workers' living standards, there is already evidence that it has started yielding its dividends in terms of employment performance and has contributed to save jobs. Moreover, once growth is restored, the greater scope for firm-level collective bargaining could allow a better reflection of productivity gains into wages. Overall, the Spanish economy appears to have made substantial progress in achieving wage moderation, even if continuous monitoring of the effects of the reform in this area is advisable, and the government must be ready to implement further action if performance worsens. In addition, trends in income inequality should be monitored in order to guarantee that cost and benefits of the reform are equally shared.

### ***...and increased hiring on permanent contracts...***

The reform has contributed to promote hiring, in particular on permanent contracts. The empirical analysis in the report suggests that the reform could be considered responsible for about 25 000 new permanent contracts each month, with the effect concentrated in small and medium firms (those below 100

employees). The reform has also contributed to containing the duration of the unemployment spells, in particular due to faster transitions into permanent contracts for those workers entering unemployment after a temporary job. The analysis also shows some signs that separations decreased after the reform, especially for temporary contracts, possibly resulting from the greater use of internal flexibility measures as an alternative to contract termination. All these findings point to a positive effect of the reform in dampening the widespread segmentation of the Spanish labour market, although the impact is so far small and it will take time before the duality of the labour market is considerably reduced.

***...even if, prior to the August 2013 legal change, it also led to a decline in collective dismissals***

By contrast, the reform decreased collective dismissals more than any visible effect on individual dismissals, probably due to the increased procedural uncertainty that followed the elimination of the requirement for administrative authorisation – and the consequent increase in judicial uncertainty – as well as the extension of the circumstances in which companies making these dismissals have to pay a tax and carry out a special training and relocation plan. These factors are also probably one of the main drivers behind the lack of effect of the reform on hiring on permanent contracts by large employers. In that respect, the Government quickly reacted by addressing some of the key elements of procedural uncertainty through a new legislative changes in August 2013. It is too early to say, however, whether these changes will suffice to significantly reduce judicial uncertainty concerning collective dismissals in the future.

***The reform has the potential to boost productivity growth and competitiveness...***

Reforms of dismissal regulations, by enhancing labour reallocation, have the potential to boost productivity growth in the long-run. Drawing from a simulation exercise based on the experience of OECD countries over a long period of time, the report suggests that the reform could potentially boost labour productivity growth in the long run by about a ¼ of a percentage point annually in the business sector (excluding agriculture, mining, fuel and professional services).

***...but should be accompanied by further effort to promote greater competition in product markets and efficient activation policies***

The full impact of the reform on job creation will depend however on complementary reforms in other areas. In particular, reforms in product and service markets will not only increase competition and boost productivity, but also improve labour market performance. The effectiveness of active labour market policies is also very important in order to successfully place unemployed workers into jobs. The changes introduced recently in this area go in the right direction, but a careful evaluation of these recent reforms is necessary to ensure that the Spanish income support system to the unemployed and employment services are able to effectively and quickly encourage and help the unemployed to find work.

***While a good step, further actions could be envisaged***

Overall, the 2012 labour market reform appears to have brought more dynamism into the Spanish labour market and is a step towards the reduction of its widespread segmentation and the increase of the competitiveness of the Spanish economy in the medium term. Nevertheless, additional adjustments could be envisaged in order to ensure that the objectives of the labour market reform are fully attained.

In particular, the government could consider treating unlawful collective dismissals as any other type of unfair dismissal (as in most other OECD countries), limiting the possibility of ordering reinstatement to cases of discrimination and prohibited grounds. In addition, some of the specific, additional costs of collective dismissals for employers introduced by the reform could be rolled back.

The evidence presented in the report also suggests that the trial period is too short for firms that are not eligible for the *contrato emprendedores*. The duration of maximum trial periods for other permanent contracts could be made longer, particularly in those cases in which this duration is currently much shorter than in other OECD countries.

Finally, a greater convergence of employers' costs of termination for permanent and temporary contracts would be desirable. This will be already the case by 2015 for firms with less than 25 employees – for fair terminations – due to a severance-pay subsidy in place for these firms and the schedule of increases in severance pay for fixed-term contracts approved in 2010. Nevertheless, the government could consider deepening this convergence process, notably by reducing ordinary severance costs for large employers to align them closer to the OECD and European averages.



## INTRODUCTION

The global financial and economic crisis hit the Spanish labour market particularly hard. The harmonised unemployment rate in Spain reached 26.7% in October 2013, the second highest in the OECD area (only exceeded by Greece) and more than three times the OECD average (7.9%). Since the start of the crisis, the number of unemployed has increased by more than 4 million persons in Spain. Even more worryingly, long-term unemployment – defined as those unemployed for 12 months or more – as a share of all unemployment has risen from 19.1% in the fourth quarter of 2007 to 50.4% in the third quarter of 2013. Despite this massive increase in unemployment, the wage component of unit labour costs in the business sector was slow to adjust. It did not decline in the first four years of the crisis, and its level at the end of 2011 was above that at the onset of the crisis.

The deterioration of the competitiveness of the Spanish economy dates back to the beginning of the 2000s, but the further decline during the early phases of the crisis and the upsurge of unemployment led to a reaction by the Spanish government with a series of structural reforms. A first labour reform in 2010 – among other provisions – increased severance pay for temporary contracts (fully effective by January 2015 only) and generalised the severance pay subsidy scheme to all employers and types of dismissal for permanent contracts signed after the date of approval of the reform.<sup>1</sup> A second major reform was undertaken in February 2012. This reform consisted of two main elements. First, it gave priority to collective bargaining agreements at the firm level over those established at the sector or regional level and made it easier for firms to opt-out from a collective agreement and implement internal flexibility measures as an alternative to job destruction. In addition, the previous practice of extending collective bargaining agreements after their end date in the case that no new agreement could be signed by the social partners was limited to a maximum period of one year. Second, the provisions of Spain's Employment Protection Legislation (EPL hereafter) were significantly modified, reshaping the definition of fair economic dismissal, reducing monetary compensations for unfair dismissal and eliminating the requirement of administrative authorisation for collective redundancies. In addition, a new permanent contract for full-time employees in small firms was introduced, entailing an extended trial period of one year.

The objective of this study is to evaluate the labour market impact of the 2012 reform. In particular, this report makes a threefold contribution. First, it places the reforms of the Spanish labour market in the context of reforms in other OECD member countries. Second, it assesses the impact of the reform on wage moderation and labour costs, in particular by looking at the way it appears to have shaped the evolution of labour costs in the business sector. Finally, it evaluates the impact of the reform on labour market flows and duality, by looking at hiring, separations, tenure on the job and duration of unemployment spells. As far as the labour market duality is concerned, special attention is devoted to flows to and from permanent contracts. To the extent that certain provisions included in the reform apply only to firms below certain size thresholds (notably 50 and 25 employees), whenever possible, the effects are estimated separately for firms above and below these thresholds.

Almost paradoxically, the comprehensive nature of the 2012 reform makes its evaluation a difficult task. In fact, the inclusion of a large number of provisions, sometimes explicitly targeted at different groups, does not allow the identification of a suitable control group. The reform also occurred in the

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1. This provision was, however, never fully implemented and partially withdrawn in 2012 (see Section 1).

middle of a double-dip recession, at a time when the economic juncture restarted to deteriorate after a short recovery that was so hesitant that employment continued to fall. More importantly, this evaluation comes only after a short time since the reform was implemented, and in many cases only short time series are available.<sup>2</sup> In addition, several amendments and implementation decrees were made at different dates after the approval of the reform in February 2012. For all these reasons, the evaluation exercise provided in this report should be considered as very preliminary and mainly limited to the short-time impact of the reform.

The report is organised as follows: Section 1 describes the main features of the 2012 reform. Section 2 places these features into an international perspective by comparing the Spanish institutions of collective bargaining and employment protection legislation with those of other European and OECD countries, documenting the country's progress vis-à-vis those of other countries. Section 3 summarises the results of several econometric exercises evaluating the impact of the reform on unit labour costs and various types of worker flows, disentangling the effects by firm size whenever possible. The full details of the econometric estimations are provided in the Annex. A simulation of the likely long-run impact of the reform on productivity growth is also presented in this section. Section 4 briefly discusses interactions with other policies, with particular attention to active labour market policies, stressing the potential role of other institutions in maximising the employment dividend of the reform. The last section provides some concluding remarks and sets forth a few recommendations for further action in this area.

## 1. Key components of the 2012 reform

The 2012 Spanish labour market reform was approved by the government in February 2012 as a *Real Decreto Ley 3/2012* and confirmed with no substantial modifications as the *Ley 3/2012 de medidas urgentes para la reforma del mercado laboral*<sup>3</sup> by the Spanish Parliament in July 2012. Subsequently, several legal provisions were introduced in order to implement the reform. This comprehensive reform modified several aspects of the Spanish labour market regulation, including collective bargaining rules and collective and individual redundancy procedures and costs.

The objective of the reform of collective bargaining was to restore competitiveness by aligning labour costs more closely with productivity and allow employers to exploit more easily internal flexibility measures as an alternative to dismissals in the presence of adverse company shocks, thereby preserving jobs and reducing employment losses in bad times (see Section 2.1 below). The reform gave priority to collective bargaining agreements at the firm level over those at the sector or regional level, so that collective agreements could adjust more closely to the specific needs of a firm. In addition, firms can now opt-out more easily from a collective agreement and pursue internal flexibility measures. For example employers can introduce unilaterally changes in working conditions (wages, working hours, work schedules) whenever there are objective economic, technical, production or organisational reasons.<sup>4</sup> In addition, in the absence of an agreement with workers' representatives, the employer willing to opt out may now unilaterally refer the matter to arbitration by a public tripartite body ("*Comisión Consultiva Nacional de Convenios Colectivos*", CCNCC hereafter). Once settled by arbitration, this kind of dispute is not fully reviewable by labour courts, since arbitration decisions may be challenged before a court only on very limited grounds (see Gomez-Abelleira, 2012). Finally, collective bargaining agreements can now be

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2. The analysis contained in this report is based on data that were available in early September 2013. It covers therefore time series up to July 2013.
  3. The full text of the Decreto Ley 3/2012 is available at [www.boe.es/boe/dias/2012/02/11/pdfs/BOE-A-2012-2076.pdf](http://www.boe.es/boe/dias/2012/02/11/pdfs/BOE-A-2012-2076.pdf) and the one of the Ley 3/2012 at [www.boe.es/boe/dias/2012/07/07/pdfs/BOE-A-2012-9110.pdf](http://www.boe.es/boe/dias/2012/07/07/pdfs/BOE-A-2012-9110.pdf).
  4. More precisely, this possibility existed also in the previous legislation but was extended by the 2012 reform.

prolonged for a maximum period of only one year after their end date (the so-called period of *ultra-activity*), in order to provide incentives to social partners to renegotiate rapidly new agreements adapted to any changes in economic conditions.

Substantial changes were also introduced with respect to dismissal legislation, with the objective of making the labour market more dynamic and less segmented, thereby increasing productivity growth and reducing the share of precarious jobs (see Section 2.2 below). The reform redefined the conditions for a fair dismissal, improving further upon the greater clarity already introduced by the 2010 reform. While actual or expected losses or loss of competitiveness remain fair reasons for an economic dismissal, the new law specifies that a dismissal is always justified if the company faces a persistent decline (over three consecutive quarters) in revenues or ordinary income.<sup>5</sup> In addition, and perhaps more important, the firm does not have to prove that the dismissal is essential for the future profitability of the firm.<sup>6</sup>

Monetary compensation for unfair dismissal was reduced to 33 days' wages per year of seniority up to a maximum of 24 months, compared to the previous severance pay of 45 days up to a maximum of 42 months' wages.<sup>7</sup> At the same time, the reform removed a worker's right to interim wages between the effective date of dismissal and the final court ruling (except in the case when the worker is reinstated). This made redundant the option employers often used before the reform of declaring a dismissal unfair even before a conciliatory procedure took place and paying upfront the corresponding severance payment (the so-called "*despido exprés*", which was de facto the most commonly-used dismissal mechanism by employers prior to the reform),<sup>8</sup> which was therefore removed.

As regards collective dismissals, the reform eliminated the requirement of administrative authorisation for collective redundancies while maintaining the obligation of good-faith negotiations with unions before serving individual notice, in line with the current legislation in most OECD countries. In addition, the new law specifies more precisely the objective reasons under which an employer can undertake a collective redundancy. In exchange, the firm has to carry out a special training and relocation plan for those workers that have been dismissed if the collective dismissal affects over 50 workers. Moreover, the reform has enlarged the set of cases in which the employer must pay a tax if the collective dismissal involves workers aged 50 years or more. In addition, in March 2013, the *Real Decreto Ley 5/2013*, made liable to this contribution, under certain circumstances, not only firms making profits in the period preceding the dismissal, but also those that end up making profits in at least two of the four years following the dismissal, thereby making this contribution dependent on future performance.<sup>9</sup> In August 2013, further legislative changes were made in order to reduce uncertainty regarding collective dismissal procedures. The *Real Decreto Ley 11/2013*<sup>10</sup> clarifies how the negotiating committee must be established

5. The new law specifies that extraordinary income should not be taken into account.
6. Case law seems to confirm that the *de jure* relaxation of the definition of fair economic dismissal also holds *de facto*. See for example the decision of the *Sala de lo Social del Tribunal Supremo* dated 20 September 2013 (STS 20-9-13, Rec. 11/2013) that specifies that judges have to establish that the economic reasons alleged by the employer are truthful and serious, but must not assess whether the employer's decision is an appropriate managerial decision.
7. In the case of fair dismissal, however, severance pay remains at 20 days' wages per year of seniority up to 12 months' wages.
8. In fact, before the reform, workers were not eligible to backpay in the case of *despido exprés*. This was the only advantage of choosing this procedure for the employer.
9. The full text available at [www.boe.es/boe/dias/2013/03/16/pdfs/BOE-A-2013-2874.pdf](http://www.boe.es/boe/dias/2013/03/16/pdfs/BOE-A-2013-2874.pdf). However, this decree also restricts the application of this tax only to those firms where the share of dismissed workers aged 50 years or more is higher than the share of workers over 50 in the firm.
10. The full text is available at [www.boe.es/boe/dias/2013/08/03/pdfs/BOE-A-2013-8556.pdf](http://www.boe.es/boe/dias/2013/08/03/pdfs/BOE-A-2013-8556.pdf).

and the documentation that the employer has to provide at the beginning of the negotiation round. Perhaps more importantly, the same decree sets unambiguous limits to the power of courts to declare void the collective redundancy procedure, thereby ordering reinstatement of workers (with backpay) with no possibility for employers to opt for additional compensation in lieu of reinstatement (as in the case of unfair individual dismissal, see above). Furthermore, it limits the cases where workers can individually challenge collective dismissal agreements.

A new full-time permanent contract for small firms (under 50 employees) was created (*Contrato de Apoyo a Emprendedores*) that allows an extended trial period of one year for firms that have not engaged in collective or unfair dismissals in the 6 months before the starting date of the contract. This “*contrato emprendedores*” includes several hiring incentives and fiscal rebates for firms under 50 employees. In addition, the reform extended the existing subsidy equivalent to 40% of ordinary severance pay (8 days per year of service, paid by a wage guarantee fund – FOGASA) to all cases of fair dismissal in the case of firms with less than 25 workers.<sup>11</sup> As the 2010 reform raised severance pay for fixed-term contracts to 12 days per year of service (from 2015), small employers will be soon liable for disbursing the same amount for open-ended and temporary contracts, in the case of fair dismissal.

Other changes introduced by the reform include the re-instatement of the two-year maximum period for extension of standard fixed-term contracts (which was temporarily suspended in August 2011), an increased flexibility to use part-time contracts and the *Contrato de formación y aprendizaje* as well as new regulations for training provision and the authorisation given to private temporary placement agencies to operate in the domain of placement of unemployed workers, alongside the public employment system.

## 2. The labour market reform in international perspective

At first glance, the 2012 reform summarised in the previous section touches upon a number of key aspects of the Spanish labour legislation. However, its depth and effectiveness must be rigorously assessed on two main grounds by: i) comparing the new Spanish institutions with those prevailing in other OECD countries (in particular, European countries); and ii) assessing the effects of the reform on labour market performance. This section provides a comparison of the evolution of Spanish labour legislation against those prevailing in other countries, by looking first at institutions regulating collective bargaining and internal flexibility and then at EPL. The empirical analysis of the effect of the 2012 reform on the performance of the labour market is then developed in the following section.

### 2.1. Collective bargaining

In most of continental Europe, wages are typically bargained collectively and most workers are covered by collective agreements through administrative extension (cf. Table 1). The rationale for collective bargaining arises from the asymmetry in contracting between individual workers and employers regarding both access to information and bargaining power. Labour laws provide framework conditions for collective bargaining to emerge so as to rebalance the bargaining power between employers and workers. Hence, all else equal, compared with a situation in which only individual contracts prevail, the more developed the collective-bargaining system is, the higher the bargaining power of workers is likely to be.

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11. In principle, a transitory norm contained in the 2010 reform, had already extended this 8-day-per-year subsidy to all firms, including even in the case of unfair dismissal (for contracts stipulated after June 2010). However, another transitory norm of the same reform that was planned to enter into force in 2012 also established that higher social security contributions would have been levied on contracts eligible for the severance pay subsidy. These transitory norms were cancelled by the reform.

Table 1. Structure of collective bargaining systems in Europe before the crisis

Bargaining levels and coordination in the second half of the 2000s

Dominant level		Central (1)	Sectoral (2)	Extension	Derogations	Local (3)	Change in dominant level since 1990	Coordination
Central	BEL	***	**	***	*	*		***
	IRL <sup>a</sup>	***	*	*	***	**		***
Sectoral	AUT		***	*		*		***
	DEU		***	*	***	**		***
	ESP <sup>a</sup>	*	***	***	*	*		*
	FIN		***	**	*	*	2→1, 1→2,3	*
	GRC <sup>a</sup>	*	***	**	*	*		*
	ITA <sup>a</sup>		***	*	*	*		***
	NLD		***	***	**	*		***
	NOR	*	***	*	*	*		***
	PRT <sup>a</sup>		***	***		*		*
Local	CZE		**	**		***		*
	DNK		**			***	2→3	**
	FRA <sup>a</sup>	*	**	***	*	***	2→3	*
	GBR		*			***		
	HUN	*	*	*	*	***		*
	POL	**	*		*	***		
	SVK		**	*		***	1,2→3	*
	SWE		**			***	2→3	**

Notes: 1 refers to central level of bargaining, 2 to sectoral and 3 to local. \* = low ; \*\* = medium ; \*\*\* = high, qualifying the relative importance for bargaining levels and the importance of coordination. The table should be read by line, as it describes the relative importance of the various bargaining levels and of the extension of, and derogation from, sectoral agreements within each country. It is not meant to provide an assessment of the relative importance of a given bargaining level across countries.

a) Collective bargaining systems incurred significant changes in Greece, France, Ireland, Italy, Portugal and Spain after the start of the global financial crisis; they are not included here as the available information is not systematic for all other countries.

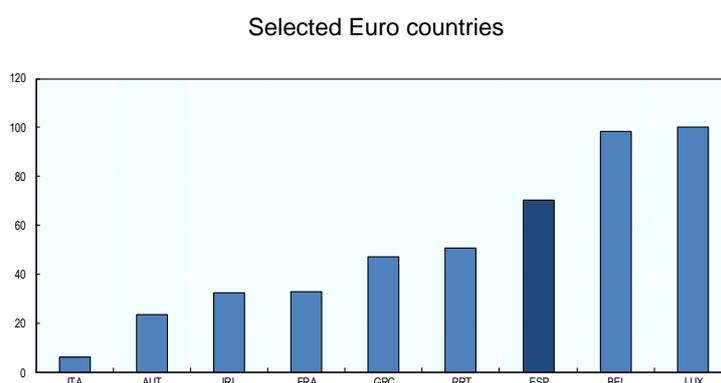
Source: OECD (2012), Du Caju et al. (2008), van Klaveren (2011).

From a theoretical point of view, the level at which collective bargaining takes place can yield substantially different outcomes. In general, aggregate flexibility brought about by centralised or coordinated bargaining allows wage-setters to internalise externalities associated with wage increases and delivers better outcomes in terms of unemployment, inflation and innovation by incumbent firms. Conversely, relative flexibility associated with firm-level bargaining typically spurs innovation by entrants and allows a better adjustment of wage growth to firm-level productivity growth, thereby allowing to save jobs in the presence of idiosyncratic shocks. By contrast, in the case of bargaining at the sectoral or regional level, cross-sector imitation often pushes wages upwards in times of boom and delays the required wage-adjustments in times of crisis, particularly in the presence of heterogeneous firm performances (see e.g. OECD, 1994, 2006, Flanagan, 1999, Haucap and Wey, 2004, Jimeno and Thomas, 2013).

In the 1990s, in a number of European countries where sectoral bargaining was playing a major role, governments pressed for national-level agreements. In this case, the key objective was often to limit the automatic indexation of wages to inflation. In fact, monetary integration ruled out external adjustment via the

exchange rate to compensate for losses in national competitiveness, and, starting from 1999 for EMU countries, the use of monetary policy instruments to adjust to asymmetric shocks. As a result, the burden of adjustment to economic imbalances and shocks shifted increasingly onto the labour market. The outcome of this process was that, in most countries of the Eurozone for which data are available (see Figure 1), less than 50% of companies had an automatic indexation of wages at the onset of the crisis – and, in many countries, automatic indexation was not imposed by collective agreements but the result of independent company policies. In that respect, Spain was among the countries where indexation was more frequent – covering about 70% of firms – which contributed to the erosion of Spanish competitiveness before the crisis, as shown by the pre-crisis evolution of its unit labour costs in comparison with other Euro countries (see Figure 2).<sup>12</sup>

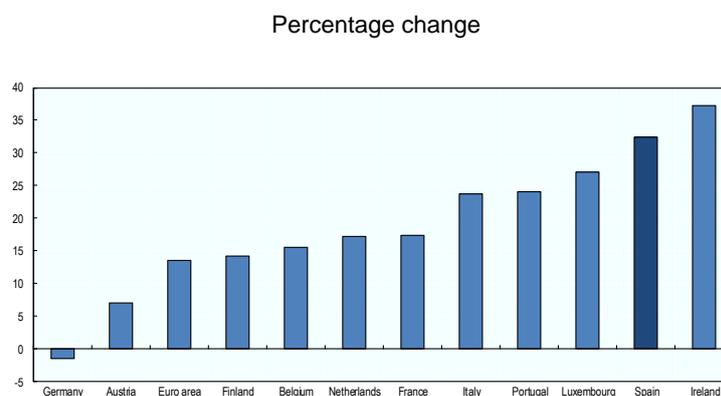
Figure 1. **Percentage of firms subject to a mechanism of adjusting base wages to inflation before the crisis**



Note: Countries are selected on the basis of available data. Data refer to 2007-2008

Source: Eurosystem's WDN Survey (Druant et al., 2009, European Central Bank, 2010).

Figure 2. **Evolution of unit labour costs in Euro countries, 2000Q1-2008Q1**



Note: Only countries that joined the Euro before 2007 are included. Data for Greece are not available.

Source: Eurostat.

At the same time, in most OECD countries, the role played by collective negotiations at the firm/establishment level has increased, leading to a significant decentralisation of collective bargaining

12. However, other structural factors – such as the dynamics of the sectoral composition of the economy – are also responsible for this trend in unit labour costs.

systems since 1990. While this process often started in the 1980s for bargaining over working-time reduction, it has since extended to matters of pay. Decentralisation has taken place in two main ways: i) instead of setting standard wage increases, sectoral agreements increasingly provide a framework for firm-level agreements; and ii) sectoral agreements increasingly include derogation clauses, allowing firm-level agreements to depart from sectoral agreements in specified cases.<sup>13</sup>

The substance of sectoral agreements has been changing in many countries, leaving much more room for firm-level bargaining on wages. In some cases, the determination of average wage increases still takes place at the sectoral level, but the decision on how to distribute wage increases among employees is left to firm-level bargaining.<sup>14</sup> However, at least before the onset of the crisis, in most countries, including Spain, firms covered by a multi-employer agreement were bound to observe what is called the “*favourability principle*”, meaning that firm level agreements had to be more favourable to employees than higher-level agreements. As a result, firm-level bargaining resulted often in higher wages with respect to minima bargained at the sector level. For example, exploiting transitions from one regime to another, wages negotiated at the firm level are found to be higher in Denmark than those negotiated under sectoral agreements, even though significantly more dispersed (Dahl *et al.*, 2011). Similar results are found by Gørtzen (2010) and Rusinek and Rycx (2013) for Germany and Belgium.<sup>15</sup>

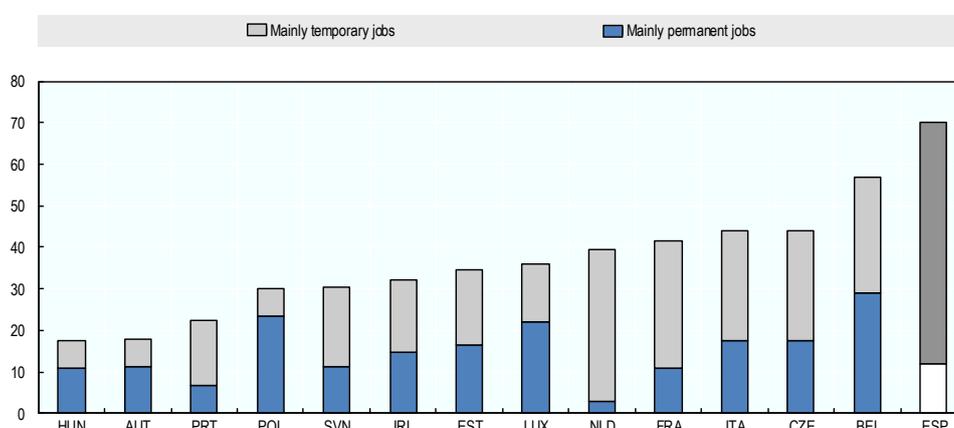
The inclusion of derogation clauses in sectoral, regional or national collective agreements, allowing firms to opt-out of higher-order agreements, has become more frequent, especially in Germany and Ireland. From a theoretical viewpoint, Jimeno and Thomas (2013) show that sectoral bargaining systems can deliver similar labour market performances as decentralised systems, if firms and workers are not prevented from agreeing to opt out of higher-level agreements. Derogation clauses are typically of two types: “hardship” or “inability-to-pay” clauses, which allow temporary deviations from higher-level agreements for firms facing economic difficulties; and “opening” or “opt-out” clauses, which can be invoked either by firms that cannot afford to meet the general standard, especially small and medium-sized enterprises, or by firms facing threats to future competitiveness and possible relocations of investment and production sites (Visser, 2004). In most countries, the use of derogation clauses remained limited before the crisis (see Table 1), with few exceptions. The “inability-to-pay” clause included in the central agreements since 2003 was regularly used in Ireland (van Klaveren, 2011). But, of particular note, actual use of these clauses expanded significantly in Germany.<sup>16</sup> In this country, industries covered by sectoral agreements allowing derogation clauses experienced greater net employment growth and lower job destruction (Brändle and Heinbach, 2010). This trend can be considered one of the most important factors that restrained the growth of unit labour costs in Germany before the crisis (see Figure 3).<sup>17</sup>

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13. In addition, the share of variable pay, by definition negotiated at the firm level, has been growing.
  14. This is a very common practice in Denmark and Sweden, and exists in Austria, Belgium, Germany and Italy. In the Netherlands, a large share of employees are covered by sectoral agreements which allow for choices between pay and working time to be decided at the firm level. In the Czech Republic, Denmark, and the Slovak Republic, industry-level agreements increasingly tend to set minima while actual wage increases for the rest of the pay scale are negotiated at the firm level (see OECD, 2012).
  15. In Germany, however, administrative extension of collective agreements is limited and occurs almost on a voluntary basis, except when automatic extension to all workers and companies of an industry is imposed by the Federal Ministry of Labour. Many employers adhere to the collective wage agreement concluded for their respective industry even if they are not member of a business association that signed it. Nonetheless, they have no obligation to do so. Nevertheless, new companies tend to resist applying branch-level collective agreements and, as a result, the proportion of workers covered by collective agreements has gone down over time, particularly in Eastern Germany (Düll, 2013).
  16. Increased use of derogation clauses resulted in cuts in basic pay, reductions in agreed wage increases, lower wage rates for job starters or reduction/suspension of bonuses (Keune, 2010; Haipeter and Lehndorff, 2009).
  17. Other factors to be mentioned, however, are the expansion of low-pay jobs and the reduction of workers covered by collective agreements

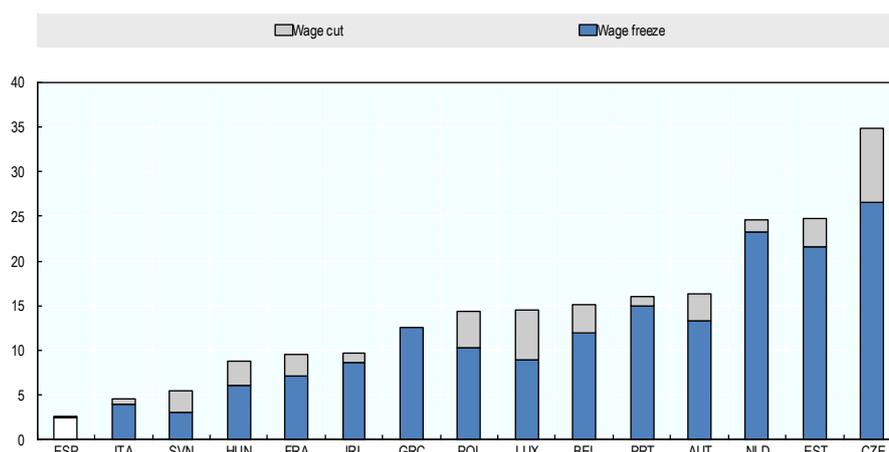
Even if derogation clauses were possible in Spain before the 2012 reform, they were seldom applied. Overall, the Spanish economy was typically characterised by a much stronger reliance on employment adjustments to absorb shocks. For example, before the onset of the crisis, the main adjustment strategy to a demand shock for about 70% of Spanish firms was to reduce employment— mainly by suppressing temporary jobs – while this strategy was preferred by only 40% of firms, on average, in other countries according to the Eurosystem’s WDN Survey (Figure 3, Panel A). In fact, wage cuts or wage freeze were very rarely undertaken by Spanish firms in the five years preceding the crisis in comparison with other countries (Figure 3, Panel B). Evidence from the follow-up WDN survey, conducted in the first months of the crisis, shows that, wage cuts and wage freezes remained much less frequent in Spain than in most other European countries, despite the severity of the 2008-2009 recession in the country (European Central Bank, 2010).<sup>18</sup>

Figure 3. Adjustment strategies to adverse shocks used by European firms before the crisis

Panel A. Percentage of firms for which job destruction is the main adjustment strategy to an adverse demand shock, 2007-2008



Panel B. Percentage of firms having frozen or cut wages between 2003 and 2008



Note: Countries are selected on the basis of available data

Source: Eurosystem’s WDN Survey (Fabiani et al., 2010, Babecký et al., 2009, European Central Bank, 2010).

18. Some caution is required in the analysis of the follow-up WDN survey since it is smaller and with a larger non-response rate than the original survey.

In this context, the 2012 reform appears to have improved the flexibility of the Spanish collective bargaining system. In particular, the introduction of the principle of dominance of firm-level agreements on higher-level ones and the greater possibility of opting-out of collective agreements even in the absence of consensus among social partners at the company level represent potential instruments of internal flexibility that, as shown above, were hardly found both in Spain and the other European countries before the crisis. Whether or not there is evidence that these instruments are contributing to promote the competitiveness of Spanish firms is a question that will be examined in Section 3.

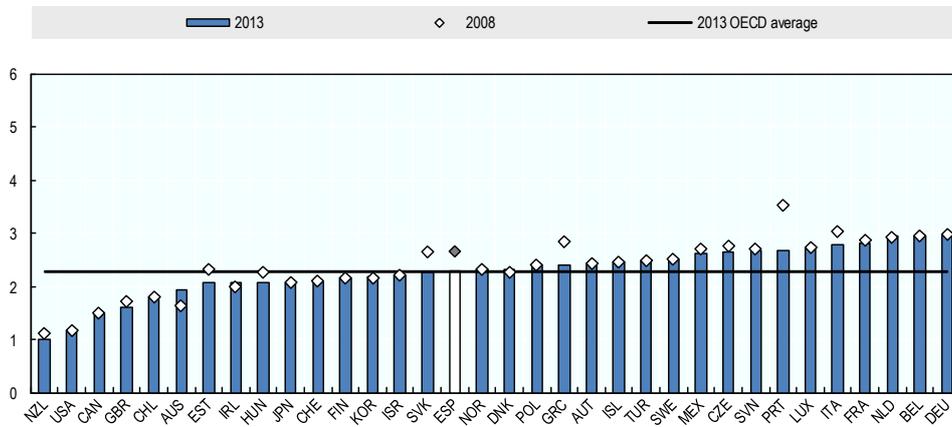
## **2.2. *Employment Protection Legislation***

There is a large body of theoretical and empirical research – summarised in OECD (2013a) among others – that suggests that hiring and firing regulations have a significant impact on the reallocation of labour resources, while the long-run impact on aggregate unemployment rates is, at best, small. Countries with relatively high employment protection are typically found to have lower hiring and separation rates and a slower resilience to output shocks. Moreover, there is evidence that in these countries stringent regulations stifle the allocation of labour to the most productive uses, thereby hindering productivity and economic growth. Perhaps more important in the Spanish case, if stringent employment protection on regular, open-ended contracts coexists with relatively easy access to fixed-term contracts, firms tend to react by substituting fixed-term for permanent contracts – due to the smaller cost involved with the termination of the employment relationship at the end of a fixed-term contract (see e.g. Boeri and Garibaldi, 2007; Bentolila et al., 2008, 2012; Jahn et al., 2012) – with no significant impact on employment and negative effects on productivity growth, in particular if the likelihood of contract conversion is small (see e.g. Dolado et al., 2012, Cappellari et al., 2012).

OECD indicators on EPL allow benchmarking cross-country differences in the stringency of hiring and firing regulations. These indicators quantify, for employers of large companies, the costs and procedures involved in dismissing individuals – or groups of employees – or hiring workers on fixed-term or temporary-work-agency contracts, as in force on the 1<sup>st</sup> of January of each year. The indicators concerning the regulations governing individual and collective dismissals of workers with regular, open-ended contracts, are perhaps the most useful for policy analysis. These indicators cover: i) procedural inconveniences that employers face when starting the dismissal process, such as notification and consultation requirements; ii) notice periods and severance pay, which typically vary by tenure of the employee; iii) difficulty of dismissal, as determined by the circumstances in which it is possible to fairly dismiss workers, as well as the repercussions for the employer if a dismissal is found to be unfair (such as compensation and reinstatement); and iv) additional restrictions for collective dismissals, such as additional delays, costs or notification procedures when an employer dismisses a large number of workers at one time. Although any quantification is inevitably a simplification (see e.g. OECD, 2013), and users need to be cautious in using these indicators to assess the relative position of a given country, the change in value of the summary indicator for regular contracts for Spain between 2008 and 2013 suggests that the recent reforms significantly reduced the rigidity of the Spanish legislation on dismissals (Figure 4).

The OECD indicators can also be used for a rough comparison, component by component, of the regulation in Spain with respect to other OECD countries. The Spanish economy appears now more flexible than the average OECD country in areas such as notification procedures and the length of notice periods (see Figure 5). In particular, notice periods were reduced in 2010 from 1 month to two weeks, independently from the length of service, which makes of Spain one of the OECD countries with the shortest notice periods, particularly for workers with a long tenure. Indeed, average notice periods in OECD countries are 3.5 weeks, 1.3 months and 2.7 months for workers with, respectively, 9 months, 4 years and 20 years of tenure at the time of dismissal (OECD, 2013b).

Figure 4. Protection of permanent workers against individual and collective dismissal, 2008 and 2013

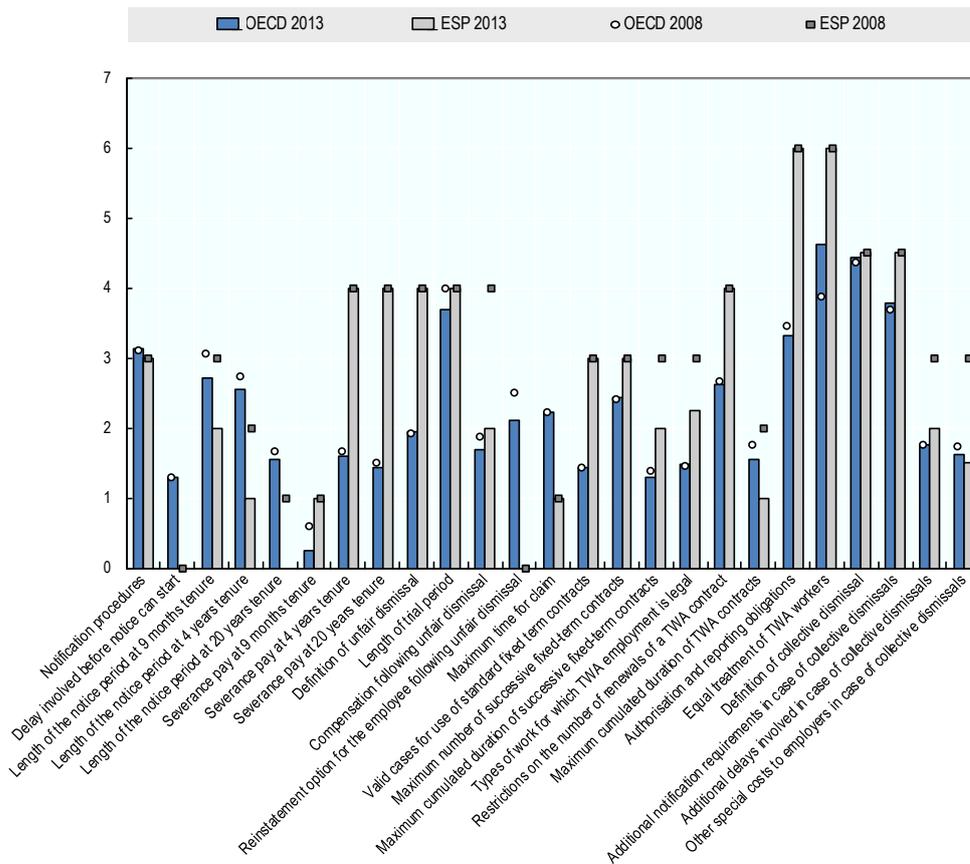


Note: The indicator vary from 0 (least restrictive) to 6 (most restrictive).

Source: OECD Employment Protection Database, 2013 update.

Figure 5. Employment protection for permanent workers: Spain vs. OECD

Disaggregate components, 2008 and 2013



Note: Indicators vary from 0 (least restrictive) to 6 (most restrictive) and refer to rules applicable to large companies.

Source: OECD Employment Protection Database, 2013 update.

In contrast with a number of countries in continental Europe, Spanish workers have no right to reinstatement in the case of unfair individual dismissal<sup>19</sup> – except when dismissal is based on prohibited grounds (such as discrimination) – which provides greater certainty to employers about the cost of dismissal. This is somewhat counterbalanced by a level of monetary compensation for dismissal which is high in cross-country comparable terms. In fact, as far as large companies are concerned, Spain remains among the countries with the most expensive requirements as regards severance pay both in the case of fair and unfair dismissal. And this occurs despite the significant reduction in compensation for unfair dismissal brought about by the 2012 reform (see Section 1), which put additional compensation in this case more in line with the amounts paid in other countries (see Figure 5). More precisely, in the case of unfair dismissal, the typical monetary compensation in OECD countries is about 13.7 monthly wages at 20 years of tenure (against about 22 months in Spain after the reform). For the same length of service, ordinary severance pay in the case of fair dismissal is on average 6 monthly wages among OECD countries where dismissed employees are entitled to it, while it is equal to 10 monthly wages in Spain, in the case of companies with 25 employees or more. Finally, Spain is one of the only 7 OECD countries where workers in large companies are entitled to ordinary severance pay even if their job tenure is shorter than 1 year (see OECD, 2013b).

The situation is comparatively better for small firms, and improved further after the 2012 reform, insofar as the latter included several provisions targeted at them. In the context of the Spanish economy, where small firms represent a large share of total employment, this is an important potential source of dynamism for the labour market.<sup>20</sup> In particular, the severance-pay subsidy covered by the wage guarantee fund, which results in a 40% reduction of the burden of ordinary severance pay borne by employers with less than 25 employees, is applicable to all cases of fair dismissals after the 2012 reform. This policy action has put the cost of ordinary severance payment at the level of the OECD average for firms of that size – excluding those countries with no compulsory severance payments in the case of fair dismissal.

The case of the trial period is somewhat similar. For ordinary permanent contracts the maximum length of the trial period is on average shorter – and therefore more constraining – than in most other OECD countries (4 months in Spain against an OECD average of 5.1 months), and can be as short as two weeks in certain sector-level collective agreements. Nonetheless, the introduction of the “*contrato emprendedores*” (see Section 1) has *de facto* made the trial period for firms with less than 50 employees the longest within civil-law OECD countries.<sup>21</sup> This is particularly important since, although the reform has significantly relaxed the definition of fair dismissal for economic reasons, dismissal for personal reasons remains relatively difficult in Spain. In principle, therefore, the longer trial period should allow small employers to better experiment and screen new employees, reducing the risk of bad matches and thereby increasing hiring incentives. Indeed, there is evidence in the literature that the length of the trial period and the extent of reinstatement are usually the two EPL components with the greatest impact on labour reallocation (see Bassanini and Garnero, 2013). Yet, a very recent decision of a local court stated that, for certain occupations, a trial period as long as one year would be in violation of article 4.4 of the European

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19. However, reinstatement with backpay can be ordered when a collective dismissal is declared void by courts (see below).
  20. According to the OECD Structural Business Statistics, firms with less than 20 employees and less than 50 employees accounted for 50% and 62%, respectively, of the Spanish non-financial business-sector employment in 2010.
  21. Legal systems can be roughly divided in civil-law and common-law countries, the latter including Australia, Canada, Ireland, Israel, New Zealand, the United Kingdom and the United States. Common-law countries typically have lighter statutory regulations limiting the freedom of contracting parties. Beyond most US states and Canadian provinces, where claims for unfair dismissal cannot be filed, the United Kingdom has the longest trial period (2 years for all firms), followed by Ireland and Israel (1 year for all firms) and Australia (1 year for firms with less than 15 employees; see OECD, 2013b).

Social Charter, which stipulates the right to advance notice for all dismissed workers.<sup>22</sup> However, it is too early to say whether this argument will be incorporated into other court decisions in the future, and the consequences that this will have for the application of the reform. Nonetheless, to avoid these types of conflict with supranational legislation, a number of OECD countries have introduced the obligation of advance notice of dismissal even for workers in the last months of the trial period, when the latter is long.<sup>23</sup>

By contrast, before the reform, Spain was one of the few OECD countries where a specific administrative authorisation was required for collective dismissals. At the beginning of 2012, a similar institutional arrangement could be found only in Greece and Mexico where an administrative authorisation is required if no agreement is reached among social partners on the terms of the collective dismissal procedure. Yet, the administrative authorisation may help reducing uncertainty about the final cost for employers of dismissal decisions in countries where judicial review of these decisions is extensive and employers' choices can be nullified by the court. For example, in May 2013, France re-introduced the requirement of administrative authorisation in the absence of agreement among social partners in order to reduce the degree of judicial uncertainty generated by the possibility for courts of invalidating social plans associated with collective dismissals and, consequently, ordering the reinstatement of involved workers, sometimes several months after dismissal.

There is some evidence suggesting that the Spanish experience immediately after the 2012 reform closely resembles the French experience before the 2013 reform. Even if the litigation rate as regards collective redundancies appears to have remained low (below 5% according to estimates by Palomo-Balda, 2013), a large share of concluded proceedings concerning collective dismissals resulted in court rulings against the employer. And, in most of these cases, the judges ruled that the dismissal procedure was null and void and ordered the reinstatement of the affected workers with backpay – a novel situation in the Spanish labour market that was essentially inexistent before the 2012 reform (see Palomo-Balda 2013, Mercader-Uguina and de La Puebla-Pinilla, 2013, and Ministerio de Empleo y Seguridad Social, 2013).<sup>24</sup> In addition, in most cases, the court decisions against employers were not based on challenges to the alleged substantive reasons for dismissal but on the non-respect of the negotiation procedure, in particular as regards the determination of employees' representatives in the consultation committee, the incompleteness of the documentation provided by the employer at the start of the consultation process, or the lack of good faith in consultations. Given these outcomes, the low rate of litigation might not be fully

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22. Juzgado de lo Social 2 de Barcelona (Sentencia 412/13, 19-11-2013).

23. This is the case, for example, in Germany, Ireland, Switzerland and the United Kingdom. Often these notice periods are, however, shorter than in the case of other permanent workers. Probationary periods, when too long, could also conflict with the requirements of the ILO Convention 158 for those countries which have ratified this convention (including Spain). Article 2 of this convention stipulates that probationary periods should be of reasonable duration. On this basis, in France (one country that signed Convention 158) the *Contrat Nouvelle Embauche* that was introduced in 2005 and allowed a 2-year trial period under certain conditions was subsequently annulled by the administrative high court because it was considered in violation of the ILO convention (see e.g. Lepage-Saucier et al., 2013). However, other countries that signed Convention 158 have long probationary periods. In Australia, for example, they are as long as one year, for small firms, and six months, for large firms, suggesting that these durations can well be considered as “reasonable”, at least conditional on firm size, even as regards the application of the ILO convention (see also the observations on Australia of the ILO Committee of Experts on the Application of Conventions and Recommendations, 2012). At the time of writing, Spanish labour unions have filed a complaint with the constitutional court concerning the possibility that the *contrato emprendedores* is in violation of Convention 158.

24. Before the reform, a judgement of nullity of a collective dismissal procedure that had been previously authorised by the labour authority was basically impossible without proving an explicit misbehaviour of the labour authority (see e.g. Mercader-Uguina and de La Puebla-Pinilla, 2013).

representative of the effective cost for employers, who might be either forced to give concessions during the negotiation phase or tempted to chain together a smaller number of individual dismissals over subsequent periods of three months in order to escape from collective dismissal regulations,<sup>25</sup> even though these chained series of dismissals would be in principle illegal if motivated by the same economic cause.

These shortcomings of the new regulations of collective dismissals have been recently addressed by the government with the approval of the *Real Decreto Ley 11/2013* in August 2013, which has more explicitly defined the requirements of the consultation procedure and the cases in which the dismissal can be declared void. In addition, the interpretation of the law has been further clarified by recent court rulings of the Supreme Court, specifying in particular that the absence of an agreement with unions do not justify per se the invalidation of the dismissal procedure and defining how extensively the consolidated accounts of a business group must be considered in assessing the justification of the dismissal decision.<sup>26</sup> It is too early to say, however, whether these interventions will prove sufficient to restore legal certainty as regards to the cost and outcomes of collective dismissals. Yet, albeit significantly reduced, the discretionary role of courts to invalidate a collective-dismissal procedure and order reinstatement remains substantial, at least on paper.

However, the reform has also increased certain, specific costs of collective dismissal by making compulsory to set a retraining and redeployment plan – in the case of dismissals involving more than 50 employees – and enlarging the set of circumstances in which a contribution to the treasury must be made (see Section 1). De la Puebla-Pinilla (2013) estimates these costs as substantial: the total cost of additional taxes and retraining/redeploying affected workers can be greater than the total amount of severance payments that the company would have disbursed had it been able to unfairly dismiss these workers.<sup>27</sup> These additional provisions have not been modified by the August 2013 revision of the reform.

Finally, the Spanish labour market is characterised by a high level of duality. At the onset of the crisis, 31.7% of wage and salary employment was on a fixed-term contract (Figure 6). This proportion went down significantly during the crisis, because of the extremely high rate of temporary job destruction, but remains among the highest in the OECD. The duality of the Spanish labour market emerges even more clearly from data on new hires. In 2007, 88.3% of new labour contracts were fixed-term, and this figure increased during the crisis peaking at 92.3% in 2011, to decline only slightly afterwards.<sup>28</sup> Although the share of

25. See for example “Los trabajadores de Pastas Gallo denuncian un ERE encubierto”, *El País*, 13 September 2013. Collective dismissal regulations must be applied if, within 90 days, the employer plans to dismiss: more than 10 workers in firms with less 100 employees; at least 10% of workers in firms with at least 100 and less than 300 employees; and 30 workers in firms with at least 300 employees.

26. See in particular the decisions of the *Sala de lo Social del Tribunal Supremo* dated 27 May 2013 (STS 27-5-13, Rec. 78/2012), 20 September 2013 (STS 20-9-13, Rec. 11/2013) and 25 September 2013 (STS 25-9-13, Rec. 3/2013). Moreover, future decisions of the Supreme Court are likely to build up a coherent body of case law that will help reducing further legal uncertainty. In fact, the 2012 reform, by allowing complaints concerning collective dismissals to be filed directly with regional labour courts, makes it possible for the Supreme Court to review all collective dismissal cases, as long as the party who has lost in the first instance lodges an appeal (Gomez-Abelleira, 2012).

27. According to Spanish legislation, if the number of dismissed workers within a period of 90 days is larger than the threshold triggering collective dismissal procedures, the dismissal is void if the firm does not implement the procedure at all. This implies that unfair dismissal (“*despido improcedente*”) is not an option open to employers in this case. As discussed above, however, in certain cases companies might decide to limit the number of affected workers, and/or chain individual dismissals over a long-period to avoid paying the higher costs associated with collective dismissals, even at the risk of having the individual terminations be ruled as unfair by a court.

28. Data on new contracts are from *Datos Estadísticos de Contratos*, published by the *Servicio Público de Empleo Estatal* (SEPE).

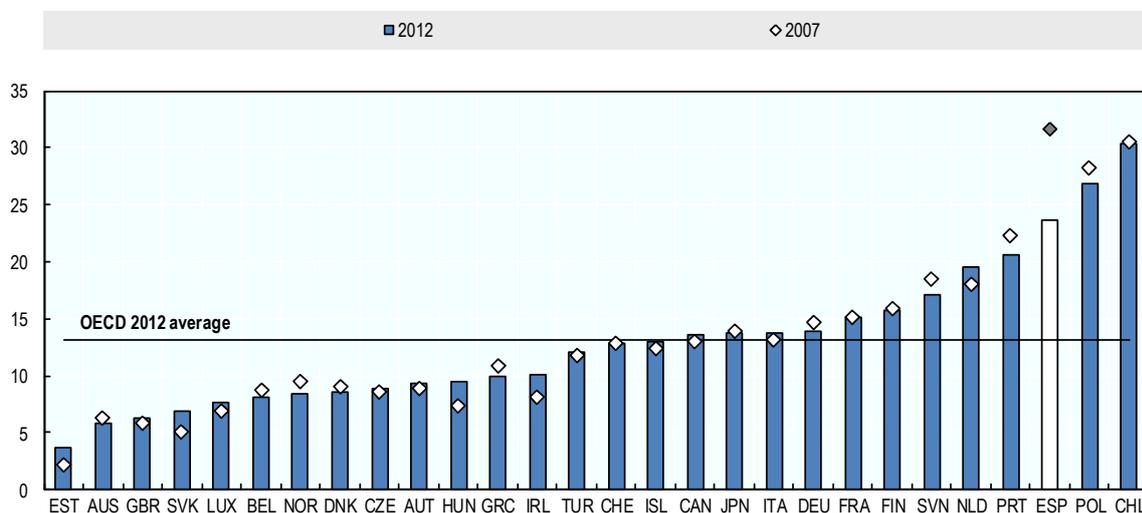
fixed-term contracts in new hires is typically high in countries with stringent EPL, the Spanish labour market appears to perform particularly badly in this respect. For example, in both France and Italy the share of fixed-term contracts in new hires was much lower in 2011 (78% in both countries; see Paraire, 2012, and Ministero del Lavoro e delle Politiche Sociali, 2012).

Despite the high share of fixed-term contracts among new hires, the rate of contract conversion is extremely low in Spain. Only 3% of all new contracts are converted from fixed-term into permanent contracts. From a worker perspective this implies that transitions across temporary and permanent statuses are rare (e.g. Güell and Petrongolo, 2007). Even taking a longer horizon, the evidence is qualitatively similar: about one-third of the workforce that is found in temporary jobs at a certain point in time permanently rotate across temporary jobs and unemployment for at least 6 to 8 years, and even when they obtain an open-ended contract it is unstable (Garcia-Serrano and Malo, 2013). In other words, the Spanish labour market is dynamically segmented between well-protected “insiders” and precarious “outsiders”, who cycle between temporary jobs and unemployment with little hope of transiting towards permanent jobs.

In contrast with the legislation of most other countries, severance pay is due in Spain in the case of termination of a temporary contract at the initiative of the employer even at the end date, but its amount is small.<sup>29</sup> In 2010, the government approved a small reform of these payments, entailing their increase from 8 to 12 days per year of service by 2015. While for firms with less than 25 employees this will equalise the cost of fair termination between temporary and permanent contracts, this cost will remain nonetheless much lower for temporary contracts in the case of large firms – and for all firms in the case of unfair dismissal.

Figure 6. Incidence of temporary employment, 2007 and 2012

Employees with temporary contracts as a percentage of total employees



Source: OECD Database on Labour Force Statistics.

29. France, Israel and the United Kingdom are among the few OECD countries where temporary workers have a statutory right to severance pay even in the case of fair termination.

### 3. The labour market impact of the 2012 reform

Almost paradoxically, the comprehensive nature of the 2012 labour market reform makes its evaluation a difficult task. In fact, the inclusion of a large number of provisions, sometimes explicitly targeted at different groups, does not allow the identification of a well-defined control group. The reform also occurred in the middle of a double-dip recession, at a time when the economic juncture started to deteriorate again after a short recovery that was so hesitant that employment had continued to decline (see e.g. Ministerio de Empleo y Seguridad Social, 2013). This suggests that one of the few available methods to analyse the role of the reform in the recent evolution of the Spanish labour market is through regression-discontinuity models in which the effect of the reform is identified through discontinuous patterns occurring at the time of its enforcement and the business-cycle is modelled through observable controls and non-linear time trends (see Box 1). The fact that discontinuous patterns of labour market performance occurring around February 2012 are used to identify the effect of the reform makes it impossible to distinguish its impact from that of other institutional changes occurring around the same date. Obviously, the analysis developed in this section assesses only the joint effect of the reform and other simultaneous institutional changes.

#### Box 1. Estimating the impact of the 2012 reform using regression-discontinuity models

The estimation strategy followed in this report identifies the joint effect of all the provisions included in the reform by comparing labour market performance before and after February 2012. The key identification assumption is that, conditional on control variables included in the model, labour market performance evolves in a relatively smooth way, so that any discontinuous jump in performance can be attributed to the labour market reform (and other institutional changes occurring simultaneously, such as the Agreement on Employment and Collective Bargaining 2012-2014, signed by the main business associations and trade unions – CEOE, CEPYME, CCOO and UGT – in January 2012). In order to properly isolate the effect of the reform from that of the business-cycle (which is key for the validity of the smoothness assumption), the estimation models capture economic fluctuations by controlling for the standardised unemployment rate, changes in registered employment (at the regional level when microdata are used) and, most importantly, polynomial time trends up to the 5<sup>th</sup> order. Baseline specifications include a polynomial trend up to the highest order  $n$  such that the  $n$ -th term is significant. However, except when specified otherwise, results are robust both to changes in the order of the polynomial and to its exclusion from the specification. When a sufficiently long number of periods is available after the reform, polynomial trends are alternatively included as either homogeneous (same parameters before and after the reform) or heterogeneous (different parameters before and after the reform), and the robustness of the results to these different specification choices is assessed. The results are also robust to the use of other controls for the business cycle such as changes in industry-level value added or productivity growth or the FEDEA index of economic activity (see the Annex for details). Finally, other variables capturing compositional effects (region, industry, workforce composition, etc.) are included in each specification. As suggested by Card and Lee (2008), since the identification is based on a time discontinuity, standard errors are always adjusted for clustering at least on time (and, where relevant, also to other dimensions).

Obviously, misspecification of the empirical model might lead to identify a discontinuous shift in performance around the date of a reform even when this shift occurs before the reform (and cannot therefore be attributed to it). To validate the empirical model, therefore, placebo tests need to be run. These tests consist in setting in the empirical model an earlier date than the actual reform date to estimate possible discontinuities. If discontinuous shifts in performance are really induced by the reform, then no effect should be found at these anticipated dates. This is indeed the case for all the results discussed in this report, where placebo tests are run by anticipating the date of the reform by up to 9 months.

A second issue concerns possible manipulations around the threshold. For example, if the introduction of the *contrato emprendedores* were anticipated, employers eligible for the subsidy could delay hiring to after the reform in order to enjoy the subsidy. However, the details and the breadth of the reform were never mentioned in the programme of the PPE before the November 2011 elections that the party won and was not made public until well after the inaugural address of Prime Minister Rajoy made in front of the parliament at the end of December 2011. It is therefore reasonable to assume that if threshold manipulation occurred, that is if firms postponed certain choices until the approval of the reform, this phenomenon concerned, at worst, only the period January-March 2012. Under these assumptions, threshold manipulation is not an issue in the regressions estimated on quarterly data because the outcome of any firm choice, which was delayed from January to March 2012, is included in the same quarter, with no effect on the average outcome of the quarter. In the case of estimates based on monthly data, baseline models are re-estimated excluding the period from January to March 2012 from the sample as an additional robustness check.

A number of provisions, however, also either entered into force, *de jure* or *de facto*, after the date of approval of the main reform (February 2012) or were modified since then. This is the case, for example, of the norms regulating the CCNCC (*Real Decreto*, 1362/2012, approved in September 2012), of those regulating collective dismissal procedures and associated financial contributions for firms (*Real Decretos* 1483/2012 and 1484/2012, approved in October 2012), of the entry into force of binding time limits for the automatic extension of expired collective bargaining agreements (July 2013) and of the corrections made to collective-dismissal regulations in March and August 2013 (*Real Decretos Ley* 5/2013 and 11/2013; see Section 1 above). This makes more difficult to identify unambiguously discontinuous patterns in the data.

Last but not least, the assessment presented here is performed shortly after the reform. Available data cover at best 18 months in the post-reform period, but sometimes much less. Thus, estimates presented in this section measure only the short-term impact of the reform. In addition, the effect of structural reforms often takes time to materialise since economic agents adapt slowly to new conditions. This is likely to be particularly the case in Spain due to the role of the courts in applying the new legislation and the time that it will take to the judicial system to develop a uniform body of case law. All of these factors suggest great caution in interpreting the results, which at best can be interpreted as preliminary and only roughly indicative of a general trend.

### 3.1. Labour costs

As discussed in the previous sections, the objective of the reform of collective bargaining and internal flexibility was to restore the competitiveness of Spanish firms, by ensuring a better adaptation of wages to productivity developments. The available, preliminary evidence concerning new collective bargaining agreements suggests that wage increases with respect to observed and expected inflation have been restrained in 2012 and 2013 (Ministerio de Empleo y Seguridad Social, 2013, BBVA, 2013a). In addition, even though the share of workers covered by automatic indexation of wages has not fallen significantly, the impact of indexation clauses on wages appears to have become smaller, probably due to a more flexible application of these clauses in the new contracts, following the recommendations of the 2012 general agreement among social partners (Izquierdo et al., 2013).

Spain has been one of the European countries where unit labour costs have declined the most since 2012 (Figure 7). Between the fourth quarter of 2011 and the second quarter of 2013, unit labour costs declined by 3.9%. This has occurred despite the withdrawal of most hiring subsidies decided by the government in July 2012, which undoubtedly pushed labour costs upwards (see Ministerio de Empleo y Seguridad Social, 2013). In the same period, in most European countries, labour costs were either on a moderate rise or decreasing only slightly.<sup>30</sup> Even in Portugal, which has also been hit hard by the crisis, the drop in unit labour costs was 3 percentage points smaller than in Spain.

One needs to be cautious, however, in attributing these developments to the 2012 labour market reform. In particular, as argued elsewhere (BBVA, 2013b), wage moderation was particularly important in the public sector in 2012 for reasons that have nothing to do with the labour market reform, albeit closely related to the the government's action to fiscal consolidation.<sup>31</sup> To shed light on this issue, therefore, Figure 8 presents the evolution of unit labour costs separately for the business sector and non-market services including the public administration. While the effect of the drop in civil servant's wages is clearly visible in the data for the fourth quarter of 2012, significant wage moderation is also observable outside the

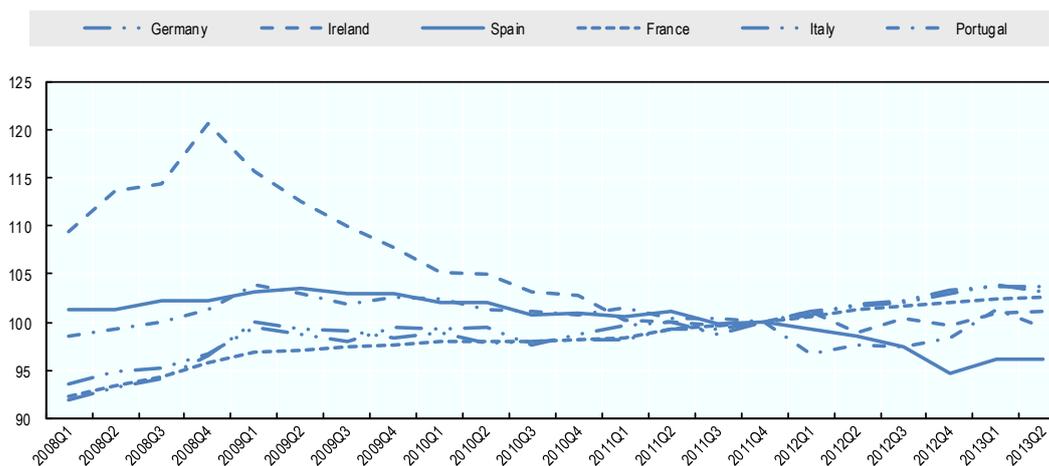
30. Data for Greece are not available. The only other European country with a significant drop in unit labour costs is Cyprus (-7.3%).

31. In Spain most civil servants have two bonus payments, equivalent to about one month's salary, paid twice a year, at Christmas and in July. The Christmas bonus was withdrawn in 2012, thereby resulting in a significant fall in 2012 public sector wages, concentrated in the fourth quarter.

public sector. In fact, in the non-agricultural business sector, unit labour costs, excluding non-wage costs, decreased by 3.2% between the fourth quarter of 2011 and the second quarter of 2013, that is an average annual drop of about 2.1%. By contrast, the growth of these costs was substantially flat in the three years preceding the reform.

Figure 7. Evolution of unit labour costs in selected European countries, 2008-2013

Q4-2011 = 100

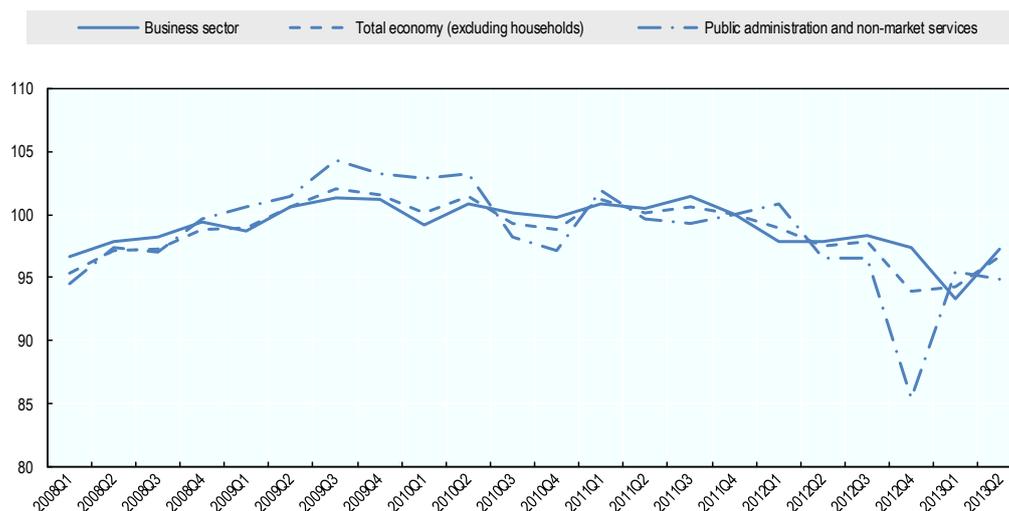


Note: Data are seasonally adjusted and adjusted for working days.

Source: Eurostat.

Figure 8. Evolution of the wage and salary component of unit labour costs in Spain, by industry, 2008-2013

Q4-2011 = 100

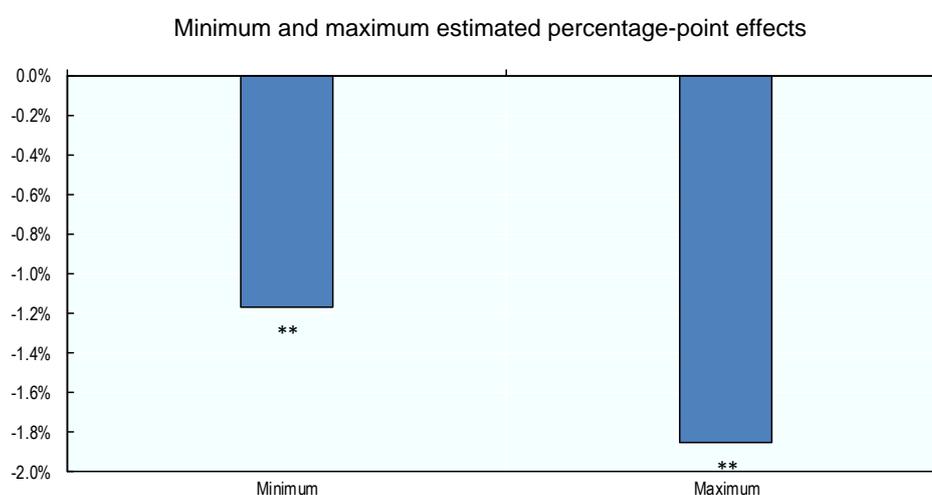


Note: Data are seasonally adjusted and adjusted for working days. The business-sector excludes agriculture.

Source: OECD calculation on the basis of the Spanish Quarterly Labour Cost Survey and Quarterly National Accounts.

Again, the evidence presented in Figure 8 is not sufficient to quantify the effect of the labour market reform on labour cost competitiveness of Spanish firms. The prolonged recession has undoubtedly affected the evolution of wages, and its effects are indeed visible in terms of wage moderation before the reform (see Figure 6 and 7). However, the econometric models estimated for this report using industry-level data allow for netting out the effect of the business-cycle, inflation and productivity growth on the dynamics of labour costs per hour worked so that the effect of the 2012 labour market reform (and the 2012 national agreement among social partners) can be identified through the discrete shift in the growth of labour costs observable since the beginning of 2012 (see Box 1). The estimated results suggest that the 2012 reform (together with the 2012 collective agreement) induced a drop in the growth of unit labour costs in the business sector of between 1.2% and 1.9% (Figure 9).<sup>32</sup> It can be concluded, therefore, that more than 50% of the observed drop in unit labour can be attributed to the 2012 reform.

Figure 9. Estimated impact of the 2012 reform on the year-on-year growth of business-sector labour costs



*Note:* Estimates obtained using different specifications of a model in which the year-on-year the industry-level harmonized index of wage and salaries per hour worked is regressed on the unemployment rate, a polynomial trend (industry-specific in certain specifications) and year-on-year changes in industry workforce composition, the consumer price index and either log employment or log labour productivity. Significance levels are obtained by adjusting errors for clustering by industry and time. The estimates are based on industry data disaggregated at the 1-digit level. \*\*: significant at the 5% level.

*Source:* OECD estimation on the basis of the Spanish Quarterly Labour Cost Survey, Quarterly National Accounts and the Encuesta de Población Activa. See Annex for the detailed estimation method and results.

These results are consistent with those of a recent Bank of Spain report (Izquierdo et al., 2013), which present estimates of firm-level wage-growth equations with similar controls and show that wage residuals appear to have been significantly smaller after the 2012 reform. Moreover, the available evidence suggests that, while this wage moderation is affecting workers' living standards, it is already yielding some dividends in terms of employment dynamics. There is in fact a consensus among the few available empirical studies published since the reform that, with respect to what is predicted by the negative GDP

32. Although formally the harmonized index of labour cost per hour worked is used as a dependent variable, to the extent that controls capturing productivity developments are included in all specifications, the estimated effect can be interpreted as estimates of the impact on unit labour costs (excluding non-wage costs). Moreover, even though labour shedding is likely to be behind part of the effect visible in raw data (cf. Figure 8), since the marginal worker who become unemployed is likely to be the one with the highest wage with respect to his/her productivity, this is unlikely to be the case for the econometric estimates, to the extent that cyclical fluctuations are rigorously controlled for in several ways in the regression models (see Box 1 and the Annex).

growth observed in the past six quarters, net employment contraction was below expectations, suggesting therefore a positive impact of the reform on employment growth. Consistent findings on this issue emerge from the simple comparison of the time series of GDP and employment growth (Ministerio de Empleo y Seguridad Social, 2013), the examination of the residuals of an estimated Okun's law (Izquierdo et al., 2013) and the estimation of structural models (De Cea and Dolado, 2013, BBVA, 2013a). The further improvement of employment trends in the third quarter of 2013 (see e.g. Puente and Font, 2013) seems to confirm this consensus.

### 3.2. Changes in worker flows

#### Hiring rates

As discussed in Section 1.3, flexibility-enhancing reforms of hiring and firing regulations are, first and foremost, expected to increase hiring and separations. However, it can be argued that the expected impact of the 2012 reform on dismissals and separations is *a priori* ambiguous, due to the new incentives to adopting internal-flexibility measures, thereby preserving jobs. Therefore, hiring behaviour by firms is perhaps the most important area where the reform of hiring and firing regulations can be assessed.

Figure 10 underlines the dramatic contraction of the hiring rate during the crisis. Quarterly data from the Labour Force Survey (*Encuesta de Población Activa – EPA*) show that the share of employees with less than 3 months of tenure in total business-sector employment decreased substantially in 2008 (from 10.7% in the first quarter of 2008 to 7.4% in the first quarter of 2009, once corrected for seasonality).<sup>33</sup> It then recovered a little (up to 8.5%) in 2010 when the Spanish economy exhibited some timid signs of recovery and then dropped again to 7.4% in the last quarter of 2011, pushed down by the worsening of economic activity. Since then, the hiring rate has stabilised at 7%-8%.

To what extent can the stabilisation of the hiring rate in spite of the adverse cyclical conditions be attributed to the 2012 reform? The estimated results obtained from hiring-rate regressions – which carefully control for business-cycle influences and composition effects – cautiously suggest<sup>34</sup> that the reform had a moderate but positive impact on hiring (See Box 1 for the general methodology and the Annex for details concerning all estimates presented in this section). Indeed, all other things equal the reform is estimated to have increased the hiring rate by about 8% (that is raising the share of employees with less than 3 months of tenure by about 0.6 percentage points),<sup>35</sup> so that the hiring rate would have kept falling until the beginning of 2013 in the absence of the reform (see Figure 10, Panel A).

The evolution of total hiring is mirrored by the dynamics of hiring on regular, open-ended contracts, even though the latter typically represents only about one tenth of total hires. Again, the fall of hiring on permanent contracts appears to have stabilised in 2012, followed by strong signs of an upward movement in the second quarter of 2013. The econometric estimates suggest that the fall in permanent hiring would

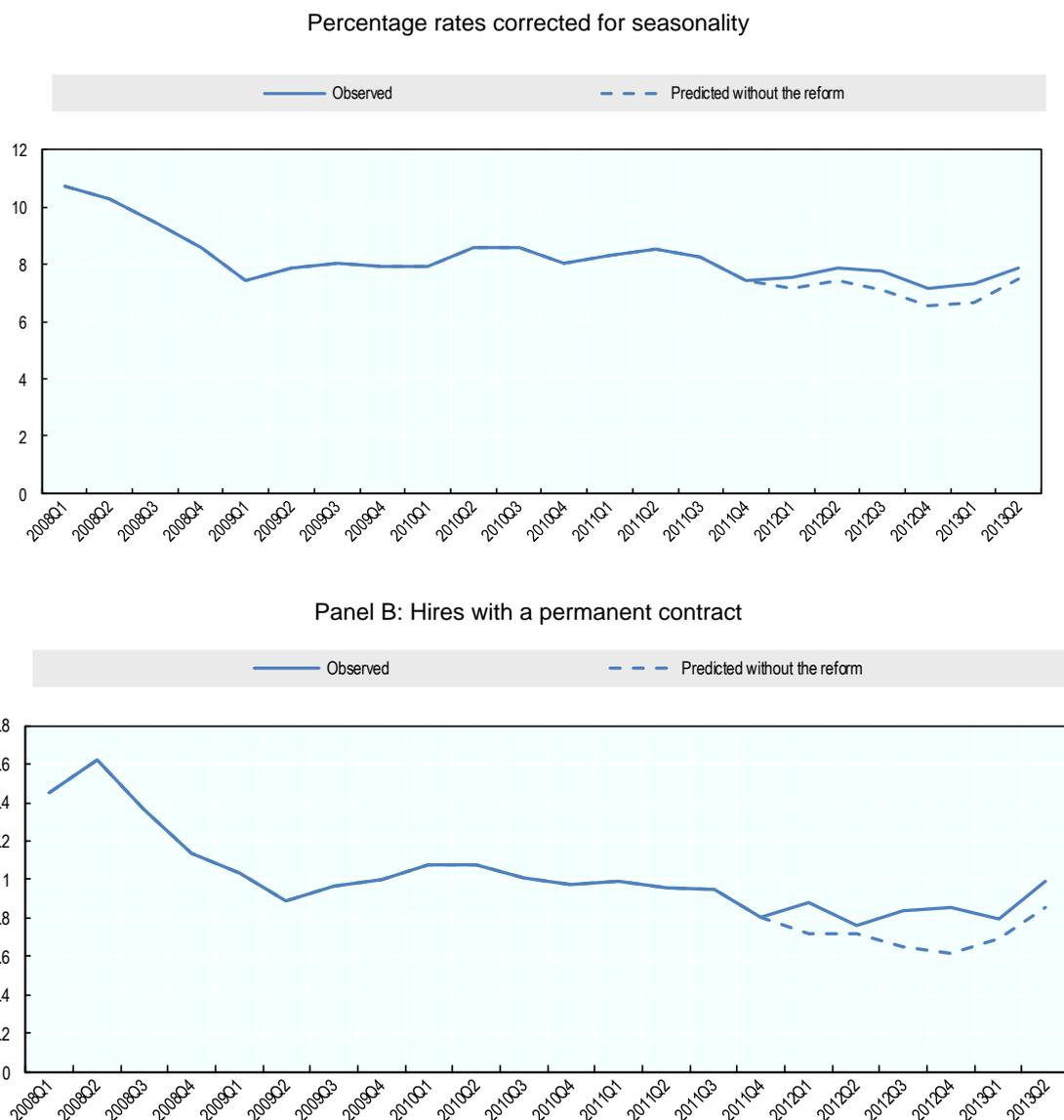
33. Following OECD (2009, 2010), hiring rates are defined here as the share of workers hired in a given period of time and that are in employment at the end of the period (counting therefore each worker only once) divided by total wage and salary employment in that period. This definition is not uncommon in the literature (see e.g. Davis et al., 2006, and Golan et al., 2006) and it is the most appropriate in the case of data from the EPA.

34. It must be underlined however that, in contrast with other econometric analyses presented in this section, the statistical significance of the estimated effect of the reform on the hiring rate depends on the assumptions made on the polynomial trend used to capture business-cycle fluctuations (see the Annex).

35. More precisely, the microeconomic estimates show that the probability that an employee has job tenure shorter than 3 months increased by about 0.6 percentage points. This probability is the micro-level equivalent of the hiring rate at the aggregate level.

have been more pronounced in the absence of the reform than what is predicted in the case of total hiring (Figure 10, Panel B). In fact, the reform is estimated to have increased the hiring rate on permanent contracts by 13%. In addition, the increase in permanent hiring in the aftermath of the reform appears to be concentrated in full-time positions. In particular, the reform is estimated to have increased the hiring rate of full-time open-ended contracts by 18% on average, while no significant effect is found as regards part-time permanent contracts. By contrast, with an estimated positive effect of only 7% – insignificant in certain specifications – the effect on hiring of temporary employees appears more limited.

Figure 10. The evolution of hiring rates in the non-agricultural business-sector, 2008-2013



Note: The figure presents observed and predicted percentage ratios of workers with no more than 3 months of job tenure on total employment in the reference week. "Predicted without the reform" indicates the empirical prediction of what the hiring rate would have been in the absence of the reform, based on empirical estimates of the baseline model for the individual probability of having tenure equal to 3 months or less. Panel A refers to all new hires and panel B to new hires with a permanent contract.

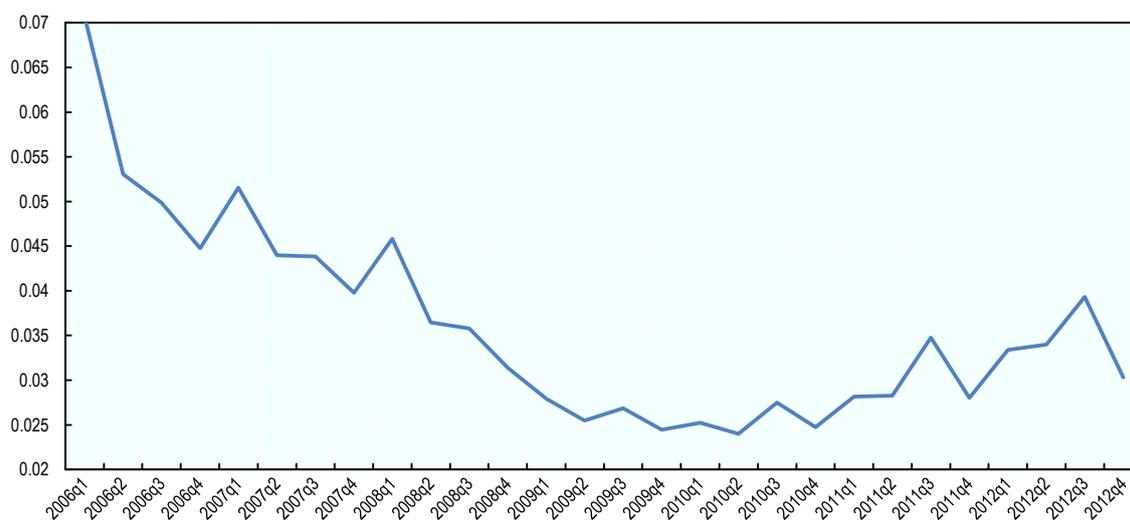
Source: Estimations on the basis of data from the *Encuesta de Población Activa* (EPA). See Annex for the detailed estimation method and results.

### Transitions from unemployment to employment

Not only are flexibility-enhancing reforms of EPL expected to increase hiring, but they are also expected to reduce unemployment duration and speed up transitions towards permanent employment. Social security microdata, in which employment histories of individuals affiliated with social security can be followed over time, are ideally suited for this analysis. For a large random sample of workers affiliated with social security, the *Muestra Continua de Vidas Laborales* (MCVL) registers all employment and unemployment spells as well as the start and end dates, thereby measuring accurately their exact duration and allowing to link these durations with previous employment spells. Figure 11 shows the proportion of individuals leaving unemployment for permanent employment for a sample of Spanish workers aged 16-64 over the period 2006 to 2012, conditional on being unemployed at that point in time.<sup>36</sup> The proportion of unemployed individuals moving to a permanent job has decreased significantly over the period, in particular due to the increase in the number of unemployed since the start of the crisis. However, there are some signs of recovery in the most recent quarters. But to what extent can these developments be attributed to the 2012 reform?

Figure 11: **Average proportion of unemployed individuals leaving unemployment to permanent employment**

Quarterly average of monthly rates, 2006-2012



Note: For each quarter, the figure presents the average monthly the proportion of individuals leaving unemployment to permanent employment for a sample of Spanish workers aged 16-64 over the period 2006 to 2012, conditional on being unemployed at that point in time. The sample includes all individuals who have been unemployed at least one day.

Source: Muestra Continua de Vidas Laborales (MCVL).

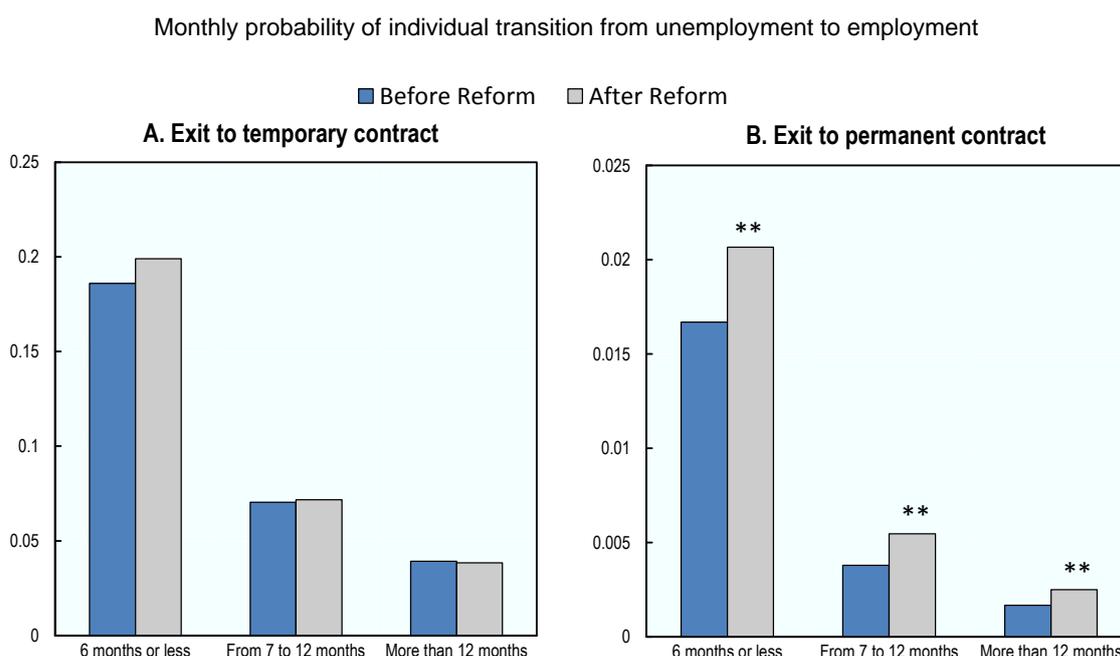
The estimation results indicate that the 2012 reform increased the probability of leaving unemployment and entering employment for any unemployment duration.<sup>37</sup> The effect of the reform is

36. The rates presented in Figure 11 are not comparable with those presented in Figure 10 for three main reasons: i) averages of monthly (instead of quarterly) transitions are considered; ii) the denominator is represented by the pool of unemployed workers (instead of wage and salary employees); and iii) individuals not registered as unemployed are not included, which leaves out youth searching for their first job and people transiting directly from job to job without spending at least one day in unemployment (however the latter are less than 3% of all employees in the data).

37. Estimations of competing-risk hazard models on the MCVL – whose results are presented in this section – were run by José Ignacio Garcia-Perez (University Pablo de Olavide) in close cooperation with the OECD

significant only as regards the probability for the unemployed of being hired on a permanent contract, which has increased by 24%, on average, during the first 6 months in unemployment where most transitions occur (Figure 12). The estimated percentage effect is even greater at longer unemployment durations (more than 40%), although obviously smaller in percentage points. By contrast, the effect of the reform on transitions to a temporary contract is small and insignificant.<sup>38</sup> Thus, for unemployment durations no longer than 6 months, the reform appears to have raised the share of exits from unemployment to permanent employment in total exits from unemployment by about 14%, taking the point estimates at face value.

Figure 12: Exit from unemployment by type of contract and unemployment duration



Note: The figure presents the average of estimated monthly probabilities of individual transition from unemployment to employment just before (February 2012) and after (March 2012) the reform, by type of new contract and unemployment duration (less than six months, from 7 to 12 months and more than 12 months). The sample includes all individuals who have been unemployed at least one day. Unemployment durations are censored at 30 months in unemployment. Panel A refers to exits from unemployment to temporary contracts and Panel B to exits from unemployment to permanent contracts. The asterisks refer to the significance level of the estimated effect of the reform on each transition probability. \*\*: significant at the 5% level.

Source: Estimations on the basis of data from the Muestra Continua de Vidas Laborales (MCVL). See Annex for the detailed estimation method and results.

Perhaps more important, the reform appears to have boosted transitions towards permanent employment significantly more for those that had a temporary contract prior to becoming unemployed,

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Secretariat, which however bears full and sole responsibility for the interpretation of the findings and the choice of the modelling strategy.

38. However, in absolute terms, the estimated effect on transitions to permanent contracts is not significantly greater than that on transitions to temporary contracts. For example, taking point estimates at face value, in the first 6 months of unemployment, the average probability of a monthly transition to a temporary job increased from 18.6% to 19.9% due to the reform whereas the average transition to permanent employment increased only from 1.7% to 2.1%. Moreover, it cannot be excluded that these relative patterns are also due to the gradual increase in severance pay for fixed-term contracts, starting in January 2012 but approved by the parliament in 2010 (see Section 2.2).

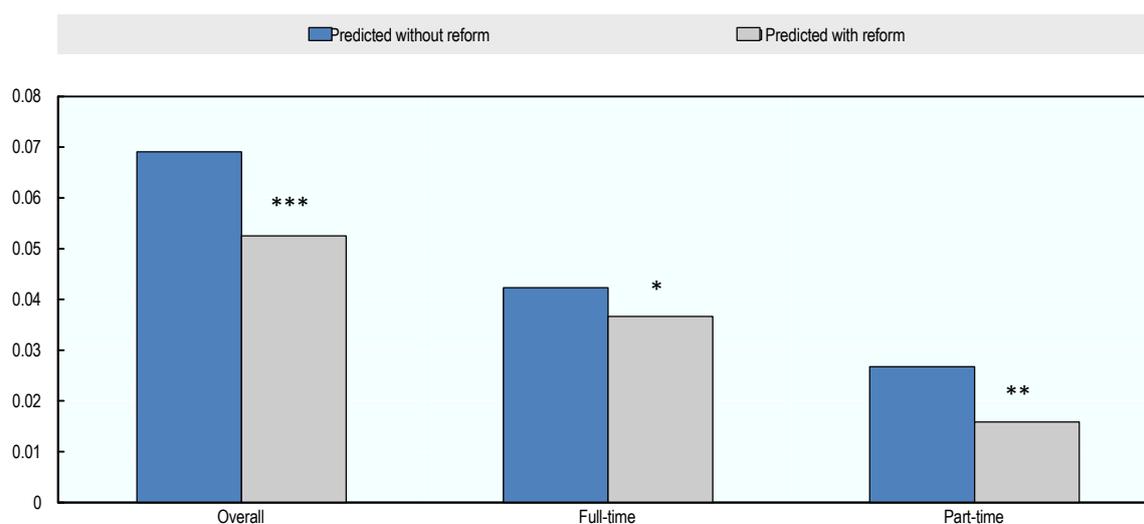
while the effect remains insignificant for those who previously held a permanent contract. Symmetrically, the results suggest a marginally positive impact of the reform on the speed of transition towards a temporary contract only for those that had a permanent contract prior to becoming unemployed. This is particularly good news insofar as it yields evidence of greater mobility across contract types, suggesting that the economy is on a slow path of a reduction of segmentation.

### Separation rates

The overall effect of the reform on worker separations is less obvious, as the reform eased firing procedures and reduced its costs but at the same time raised the incentives to adopt internal-flexibility measures, in the first place to avoid terminations. The *Encuesta de Coyuntura Laboral* (ECL) is a large establishment-level survey that registers worker flows at the establishment level and can, therefore, be used to shed light on which effect dominates.

The estimation results show that the 2012 reform significantly reduced the proportion of workers leaving the establishment in a given quarter. The average overall separation rate was reduced by 24% in the aftermath of the reform (Figure 13). The reduction has been particularly sizeable for the separation rate of part-time workers (41%) but there is also some evidence of an effect for full-time workers (13%), which however is only marginally significant from a statistical point of view.

Figure 13: The effect of the reform on quarterly separation rates at the establishment level



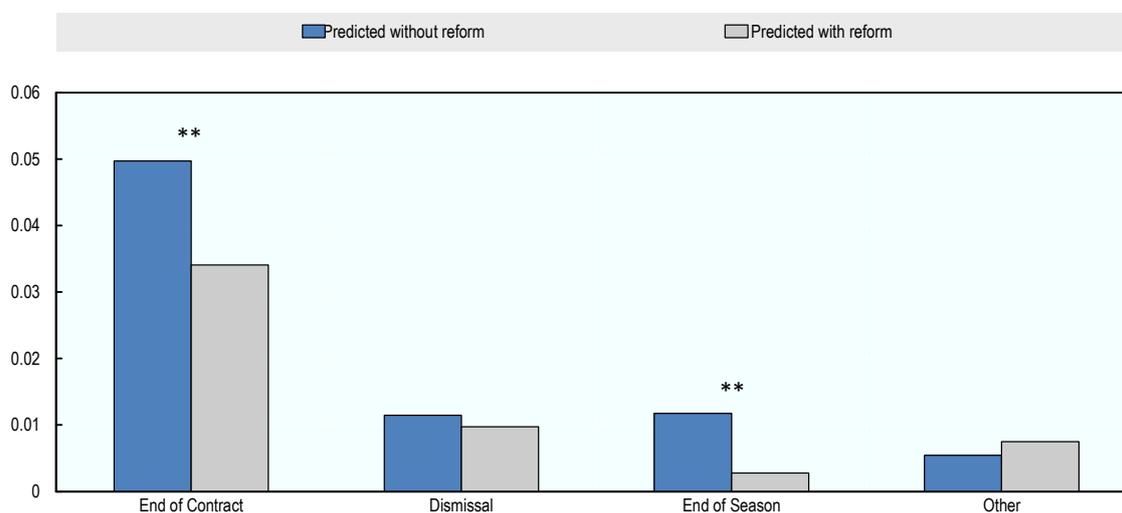
Note: The figure shows empirical estimates of average separation rates in the post-reform period obtained from the estimation on quarterly data for the period 2006-2012 of the baseline model of establishment-level separation rates, as predicted by observable variables. "Predicted without the reform" indicates the empirical predictions of what separation rates would have been in the absence of the reform. For each establishment, separation rates are defined as the ratio of separations in a quarter divided by the average of total employment between the start and the end of the period. The asterisks refer to the significance level of the estimated effect of the reform on each separation rate. \*\*\*, \*\*, \*: significant at the 1%, 5% and 10% level, respectively.

Source: Estimations on the basis of data from the Encuesta de Coyuntura Laboral (ECL). See Annex for the detailed estimation method and results.

In addition, establishment-level data allows disaggregating flows by contract type and reason of separation. In particular, it is possible to obtain distinct estimates of the effect of the reform on contract terminations (for temporary workers), dismissals of permanent workers, terminations due to end of season for seasonal workers with an open-ended contract – "*fijos discontinuos*" – and other reasons for separation (including retirements, voluntary separations, deaths, etc.). The estimation results (Figure 14) point to a

significant impact of the reform on separations rates due to the end of contract for temporary workers (31% decrease) and seasonal workers (71% decrease), but show no impact on dismissal rates and separations for other reasons.

Figure 14. The effect of the reform on separation rates at the establishment level by type



Note: The figure shows empirical estimates of average separation rates in the post-reform period obtained from the estimation on quarterly data for the period 2006-2012 of the baseline model of establishment-level separation rates, as predicted by observable variables. "Predicted without the reform" indicates the empirical predictions of what separation rates would have been in the absence of the reform. For each establishment, separation rates are defined as the ratio of separations in a quarter divided by the average of total employment between the start and the end of the period. The asterisks refer to the significance level of the estimated effect of the reform on each separation rate. \*\*: significant at the 5% level.

Source: Estimations on the basis of data from the Encuesta de Coyuntura Laboral (ECL). See Annex for the detailed estimation method and results.

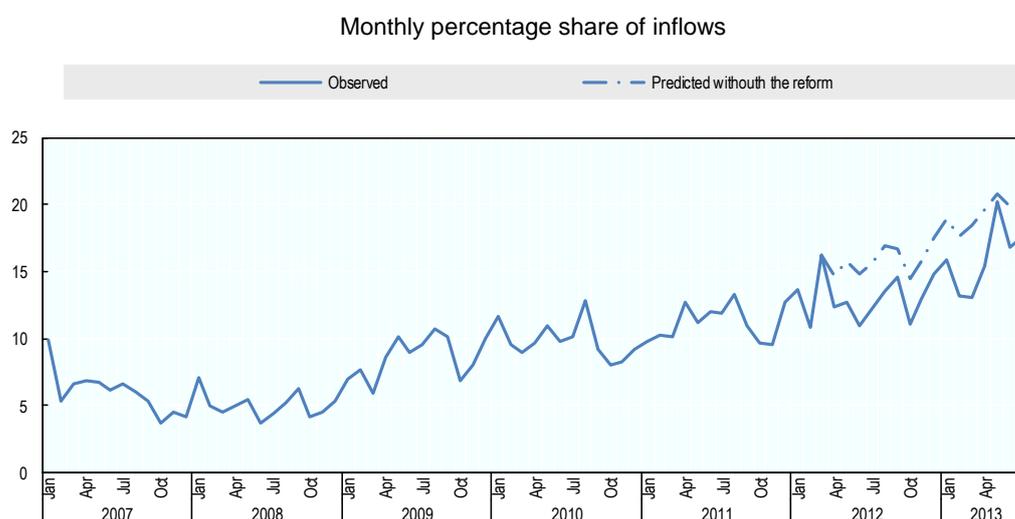
The analysis of job spells and reasons for termination using social security microdata (MCVL) appears to confirm the results for both dismissals and separations for other reasons obtained with establishment-level data. For permanent workers, the estimation results do not show any effect of the reform on the duration of job spells and the probability of separation, no matter whether for dismissal or for other reasons. However, as regards fixed-term contracts, no effect of the reform on contract duration and separation probabilities is found in MCVL data, in contrast with results obtained with establishment-level data. Even though simple statistical reasons might explain this discrepancy,<sup>39</sup> it suggests some caution in interpreting these findings. At the very least, however, these results seem to confirm that the reform has not increased the number of separations, in general, and dismissals, in particular. This fact suggests that the stimulus provided by the reform to internal flexibility measures as an alternative to job suppression more than compensated for the upwards effect on separations brought about by the easing of dismissal procedures and costs.

39. For example, there is some evidence that the reduction of termination rates for temporary contracts is concentrated in small establishments (see the Annex). As a consequence, the reform has reduced the average establishment-level separation rate with smaller or no impact on aggregate separations (insofar as aggregate separation rates can be seen as a weighted average of establishment-level ones, with establishment size as weight).

### Individual and collective dismissals

Has the distribution of dismissals – between individual and collective terminations – been affected by the reform? It is possible to resort to monthly statistics on inflows onto unemployment benefits (*prestaciones por desempleo*) to investigate the relative variation of individual and collective dismissals, insofar as the reason for claiming benefits is reported in these data.<sup>40</sup> The share of collective dismissals increased steadily since 2008, from about 5% to a peak of 20% in May 2013 (Figure 15). However, there is no sign that the reform is responsible for this trend: the share of inflows onto unemployment benefits due to collective dismissals seems to have been on the rise even before, probably as the result of the restructuring of the economy brought about by the economic crisis. On the contrary, the estimated results indicate that the share of collective dismissals would have been 3.1 percentage points larger in the absence of the reform. In practice, the empirical estimates suggest that the 2012 reform decreased the number of inflows onto unemployment benefits for reasons of collective dismissals by about 32%, while in the same period the contraction of inflows due to individual dismissals was small and marginally significant.<sup>41</sup>

Figure 15. Share of inflows onto unemployment benefits due to collective dismissal in total inflows due to dismissal, 2007-2013



Note: The figure presents the monthly percentage share of inflows in unemployment benefits due to collective dismissal in total inflows due to dismissal, as observed in raw data and as they would have been in the absence of the reform, according to baseline estimates on the basis of data covering the period January 2007-July 2013.

Source: Estimations on the basis of data on the *prestaciones por desempleo de nivel contributivo* (Source: MEYSS). See Annex for the detailed estimation method and results.

40. However, some cautions must be exerted in interpreting the results from this analysis since not all dismissals are counted. Inflows data considered here are limited to workers who are eligible to standard unemployment benefits because of sufficient previous contributions and contribution periods (*Prestaciones de nivel contributivo*). They exclude, therefore, workers only eligible for other types of unemployment-related subsidies (*Prestaciones de nivel asistencial*). Moreover, inflows data considered here exclude those resulting from conciliation settlements, court rulings, end of trial period or contract suspensions, because the nature of the originating event (individual or collective dismissal) is not reported. By contrast, benefit claims ex *Ley 45/2002* – individual dismissals for which benefits are claimed before any court ruling stating whether the dismissal is fair or unfair – are included in the analysis.
41. In the baseline model, the estimated contraction for these inflows is of 6%. However this estimate is significant at the 10% level only and is not robust to changes in the specification (see the Annex for more details).

Taking into account the discussion of Section 2.2, these findings are probably not surprising. There is little controversy that the 2012 reform reduced the cost and difficulty of individual dismissals, which explains the pick-up on hiring on permanent contracts that has been observed since its implementation (see above). As already noted, the lack of impact of the reform on individual dismissals is likely to be due to the counterbalancing effects of greater use of internal flexibility measures and lower cost of individual dismissals. By contrast, the case of collective dismissals is more complex. On the one hand, the reform has made economic dismissals significantly easier, even though this is true for both individual and collective dismissals. On the other hand, the reform, under certain circumstances, has increased the taxes levied on firms in the case of collective dismissals (see section 1). Moreover, the reform, as implemented initially, significantly increased the risk that the dismissal procedure could be invalidated by a court in the case of litigation. The observed empirical patterns tentatively suggest that these factors are likely to have played a key role in discouraging collective dismissal decisions.<sup>42</sup> Yet, to the extent that the *Real Decreto Ley 11/2013* approved in August 2013 has restricted the discretionary role of courts of declaring a dismissal void and ordering reinstatement (see Section 1), it would not be surprising if some of the negative effects of the 2012 reform on the share of collective dismissals in total dismissals are subsequently unwound.

#### *Firm-size differences in the impact of the 2012 reform*

Given the importance of the provisions targeted at small firms in the architecture of the reform (see Section 1), it is important to evaluate firm-size differences in its impact. In Spain, employers have the obligation to inform the public employment service about the characteristics of all new individual contracts they sign as well as about extensions of fixed-term contracts and/or their conversions into permanent contracts. These data are then collected into a database – containing also workers and employers characteristics, including firm size – that can be used to analyse the dynamics of new contracts on a monthly basis, allowing the examination of firm-size heterogeneity in hiring patterns.

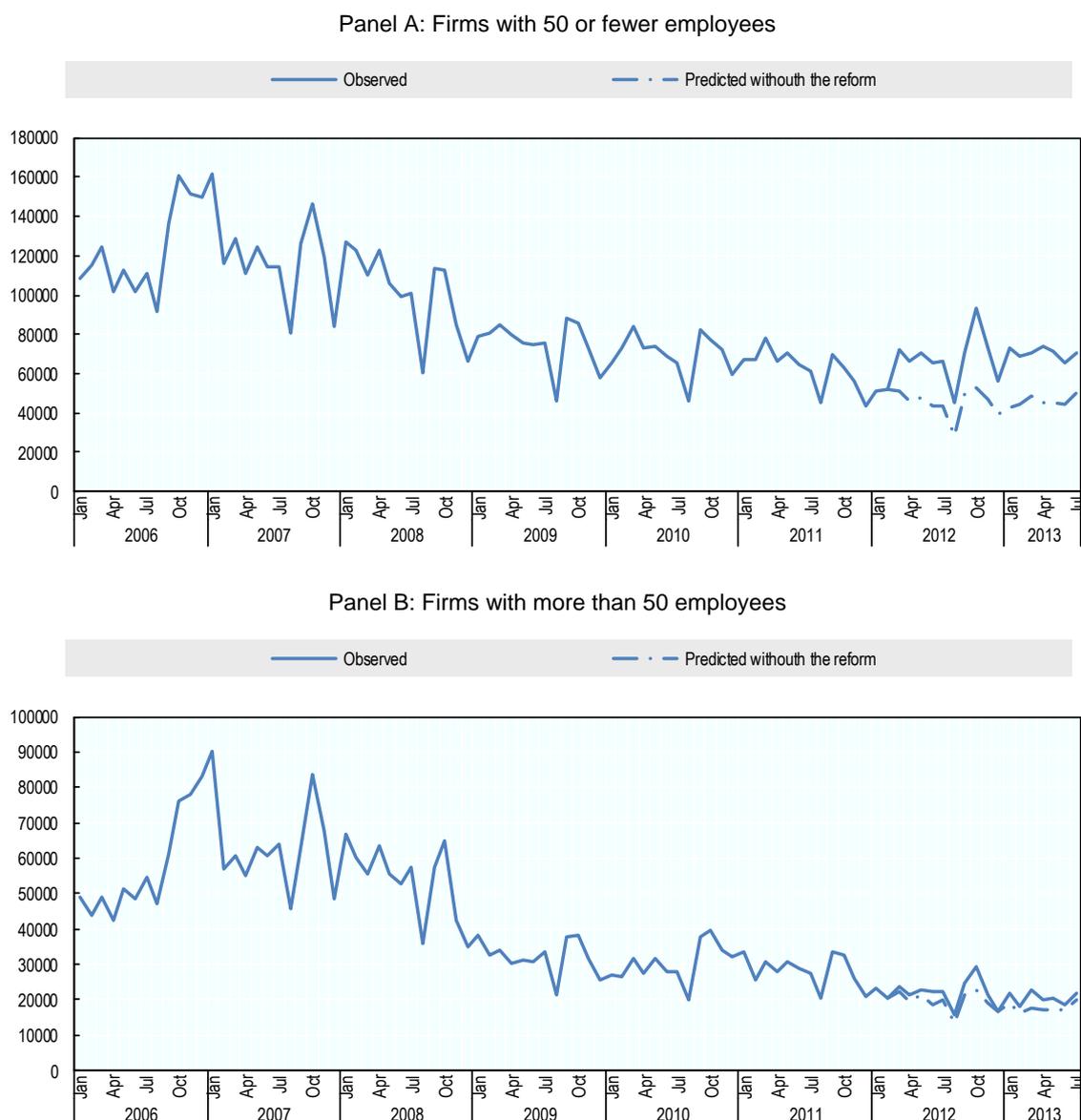
In January 2007, about 250,000 new permanent contracts were signed (Figure 16). Of these, about two-thirds were in firms with 50 or fewer employees (cf. Panel A and B). As already noted, the crisis hit job creation hard. Five years later, new permanent contracts were as few as 75,000 per month, with the proportion accounted by small firms remaining approximately constant. The trends concerning new open-ended contracts by firm size has diverged since then. For example, in January 2013, firms with 50 employees or less accounted for more than three-fourths of all new permanent contracts concluded that month.

To what extent are these developments accounted for by the 2012 reform? The econometric models estimated for this report suggest that at least 25 000 new permanent contracts per month in firms with 50 employees or less can be attributed to the 2012 reform, while no significant effect is observable for larger firms. These patterns are mirrored by those of the share of permanent contracts in all new contracts, which is estimated to have been raised by 3 percentage points – that is a percentage increase of about 30% – for firms with 50 or fewer employees.

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42. However, as discussed in Section 1, individual dismissals have become particularly easier and less costly in the case of small firms: companies with less than 50 employees can hire by stipulating an open-ended *contrato emprendedores*, which allows a trial period of up to one year, while companies with less than 25 employees can apply for a severance-pay subsidy for any type of fair dismissal. It is not impossible that part of the effect of the reform on the share on collective dismissals can be attributed to these provisions targeted at small firms. As benefit inflows disaggregated by firm size are not available, this issue cannot be investigated further here. Firm size heterogeneity in the impact of the reform is examined in the next subsection as regards other types of flows.

Figure 16. Monthly inflows into permanent contracts, including contract conversions, 2006-2013



Note: The figure presents the number of new permanent contracts signed each month, as observed in raw data and as they would have been in the absence of the reform, according to baseline estimates covering the period January 2006-July 2013.

Source: Estimations on the basis of data on the *datos estadísticos de contratos* (Source: SEPE). See Annex for the detailed estimation method and results.

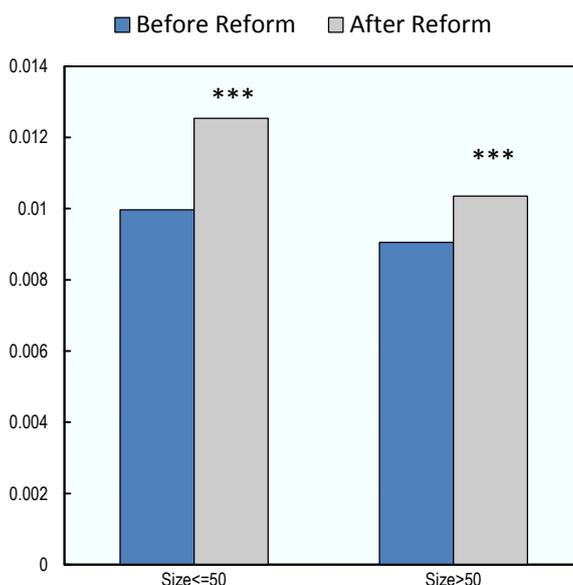
Consistently, it appears from the analysis of social security microdata that the 2012 reform had a greater impact on transitions from unemployment to permanent employment in small establishments rather than large establishments (Figure 17).<sup>43</sup> The results from the estimation of the competing-risk hazard

43. Although a disaggregation by firm rather than establishment size would be more interesting, this is not possible given the available data. The only size variable which is available in the *Muestra Continua de Vidas Laborales* is the size of the social security accounting unit (*Cuenta de Cotización*), which is unique for each firm at the provincial level. It does not correspond exactly either to the plant or the firm level – it covers many plants of the same firm if they are in the same province but plants established in different

models suggest that the reform increased the average transition to a permanent contract – conditional on being unemployed for six months or less – by 26% in establishments with 50 or fewer employees, compared with 15% in establishments with over 50 employees. To the extent that the large majority of firms are mono-establishments, this confirms that the impact of the reform on hiring is greater for smaller firms.

Figure 17. **Exit from unemployment to permanent employment by firm size**

Monthly probability of individual transition for unemployment durations smaller or equal than 6 months



*Note:* The figure presents the average of estimated monthly probabilities of individual transition from unemployment to permanent employment just before (February 2012) and after (March 2012) the reform conditional on being unemployed at least one day but less or equal than 6 months, by type of contract and firm size. Unemployment durations are censored at 30 months in unemployment. The asterisks refer to the significance level of the estimated effect of the reform on each transition probability. \*\*\*: significant at the 1% level.

*Source:* Estimations on the basis of data from the Muestra Continua de Vidas Laborales (MCVL). See Annex for the detailed estimation method and results.

When the data are further disaggregated by firm size, the greatest estimated expansion in the number of new permanent contracts induced by the reform is found in very small firms with 25 employees or less (45%, corresponding to about 21,000 new contracts per month). By contrast, in firms with 26 to 50 employees the increase was relatively more modest, not only in absolute terms (about 4,000 new contracts per month) but also in percentage terms (about 28%).

Given that the positive effect of the reform appears concentrated in very small firms, a first obvious candidate in explaining these findings is the severance-pay subsidy made available for firms with less than 25 employees in all cases of fair dismissal (see Section 1). Indeed, to the extent that fair economic dismissals have become easier and less uncertain after the reform, this subsidy is likely to play a greater role than before the 2012 reform, when most employers used to take the route of “*despido expreso*” and severance payments were therefore not subsidised. Obviously, however, this provision alone cannot explain the significant impact for larger companies. Another factor that is likely to be behind this upsurge

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provinces are not linked. For a matter of simplicity each social security accounting unit is referred to as an “establishment”, hereafter.

in hiring on permanent contract is the introduction of the *contrato emprendedores*, which *de facto* extended the trial period for firms with less than 50 employees.<sup>44</sup> Indeed, for these firms, the positive effect of the reform is somewhat larger on new hires than on contract conversions, which in the period of analysis concerned, by and large, correspond to workers hired before the reform. Yet, some significant impact of the reform is detectable in the case of conversions as well.

Can these two factors, taken together, fully explain the firm-size heterogeneity of the effect of the reform? This is far from clear. Less than 8,000 *contrato emprendedores* are typically stipulated in a representative month. Given that the number of new permanent contracts in firms with 25 or fewer employees is on average 5 times larger than the corresponding figure for employers with 26 to 50 employees, a large share of the new *contrato emprendedores* is likely to have been signed in firms with 25 or fewer employees.<sup>45</sup> Moreover, in firms with 26 to 50 employees, the impact of the reform on contract conversions is very close to that on new hires on permanent contract. These observations suggest a third factor that could be behind the observed empirical patterns. The larger the size of the firm, the greater the likelihood the firm needs to undertake a large number of dismissals at some point in time. But the threshold triggering collective dismissal procedures varies little with firm size (from 10 dismissals within a period of 3 months for firms with less than 100 employees to 30 employees within the same period for firms with 300 employees or more); therefore, collective dismissals procedures are likely to be more often binding in the case of larger firms.<sup>46</sup> Given that the evidence presented in the previous subsection and in Section 2.2 suggests that collective dismissals might not have become less difficult and costly, larger firms might have refrained from hiring on permanent contracts to avoid incurring the risk of making collective dismissals in the future, particularly at a time of sluggish demand and uncertain perspectives.

This conjecture can be tested by examining further by more disaggregated size classes the impact of the 2012 reform on hiring by firms with more than 50 employees. The estimated results based on contract data show that the reform has significantly increased the number of new permanent contracts in firms with 51 to 100 employees (by 23%), while no significant effect is detected for larger firms.<sup>47</sup> To the extent that all these firms are ineligible both for the *contrato emprendedores* and for the severance-pay subsidy, the combination of easier individual dismissals and more burdensome collective dismissals remains the only explanation for the simultaneous increase in the number of permanent contracts stipulated by firms with 51 to 100 employees and the lack of significant changes for larger firms. Moreover, for the former class of firms, the positive effect of the reform is entirely concentrated in contract conversions, suggesting that these firms use fixed-term contracts as a substitute for longer trial periods.

Overall the evidence presented in this section not only suggests that the Spanish labour market has become more dynamic in the aftermath of the 2012 reform but also that duality is decreasing. Indeed, hiring on permanent contracts is on the rise while there is no evidence of an increase of transitions out of permanent contracts. The latter fact is also confirmed by recent evidence provided by the Ministerio de Empleo y Seguridad Social (2013), which shows that there is no difference in the probability of leaving a

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44. This could also contribute to explain why the effect is concentrated in very small firms: to the extent that mismatching problems are likely to be more problematic in these firms, they can benefit more from the longer trial period made available by the *contrato emprendedores*.

45. No breakdown by firm size is available for the *contrato emprendedores*.

46. For example, according to OECD (2009) the average quarterly dismissal rate of continental European countries for which data are available is close to 1%. That is, in a normal year, almost 1% of employees are dismissed each quarter. Therefore, any firm with 3,000 employees or more dismissing at that rate would cross the threshold defining collective dismissals.

47. The difference between these two classes of firms in the effects of the reform is also significant, at least at the 10% level.

permanent contract conditional on tenure between a *contrato emprendedores* and a standard open-ended contract in the first 12 months of a job spell. This implies that longer trial periods in the former type of contract have not implied greater precariousness for workers hired with these contracts. Moreover, dynamic segmentation has also been reduced insofar as transitions between temporary and permanent contracts have become more frequent (see above). Nevertheless, if the percentage increase of transition rates that can be attributed to the reform is sizeable, their absolute magnitude is small. Moreover, there is some evidence suggesting that the reform have particularly reduced separations for temporary contracts, due to the greater incentives for internal flexibility as an alternative to the suppression of fixed-term posts (see Figure 14). As a consequence, it is likely that it will take some time before these developments become visible in the share of temporary employees in total employment. Indeed, using the same microeconomic model used before for hiring rates but replacing the dependent variable, no significant effect on the share of workers with a fixed-term contract is estimated if the regression discontinuity is set at the time of the reform (first quarter of 2012),<sup>48</sup> while a modest – albeit robust and significant – effect appears if the discontinuity is tested one year later.<sup>49</sup> It is, however, too early to say what will be the magnitude of the long-run impact of the reform on this variable.

### 3.3. *Simulating the long-run impact of the 2012 reform on productivity and economic growth*

The increase in the pace of reallocation of labour resources and the reduction in labour market duality are expected to increase efficiency and labour productivity growth in the long term (see Section 2.2). However, insofar as multi-factor productivity growth – measuring efficiency enhancement in an economy – cannot be meaningfully estimated at greater frequencies than annual ones, it is not possible to test whether the 2012 reform has effectively brought about this outcome. Nevertheless, by exploiting the quantification of the institutional change implied by the reform – as reflected in OECD EPL indicators – and resorting to estimates available in the literature, it is possible to provide a tentative estimate of the potential impact of the 2012 reform on productivity growth and, with some additional assumptions, overall economic growth.

Bassanini et al. (2009) estimate the long-run potential impact of changes in the OECD summary indicator of EPL for regular contracts (see Section 2.2) on multi-factor and labour productivity growth in the business sector, excluding agriculture, mining, fuel and professional services.<sup>50</sup> Their industry-specific estimates are based on the characteristics of each industry, notably as regards the propensity to use dismissals as a way to adjust to shocks.<sup>51</sup> Taking their most reliable estimate at face value and assuming as given the sectoral structure of the Spanish economy in 2007,<sup>52</sup> in the long-run an hypothetical reform reducing the EPL indicator for individual and collective dismissals by half a point – a large reform in terms of the historical record for OECD countries –<sup>53</sup> would result, in the business sector, in higher multi-factor

48. This finding is confirmed by running the same estimation model on social security data.

49. The estimated drop of the share of temporary workers is of 0.5 percentage points.

50. These industries were excluded due to the difficulty of measuring accurately multi-factor productivity growth therein.

51. This propensity is approximated by industry-specific US dismissal rates, a choice justified by the light firing regulations in this country that can be then taken as a benchmark to mimic the distribution of dismissal rates in the absence of regulation.

52. This year is chosen to avoid that the simulation be perturbed by large cyclical swings in the structure of the economy. Results are however robust to the choice of the year.

53. The 2003 severance-pay reform in Austria, often cited as an example of large, radical reform, resulted in about half a point reduction of these indicators.

annual productivity growth by 0.45 percentage points and faster labour productivity growth by 0.3 percentage points.

What predictions would these estimates imply for the Spanish economy? The size of the 2012 reform, as measured by OECD indicators, is only slightly smaller (0.44; cf. Figure 4) than what considered by Bassanini et al. (2009). By applying the same estimated coefficients, it can be expected that, in the long-run, labour productivity should grow faster by about  $\frac{1}{4}$  of a percentage point each year in the business sector (excluding agriculture, mining, fuel and professional services) as the result of the reform. Taking into account that these industries accounted for 59% of total value added in the Spanish economy before the crisis, and assuming conservatively no impact on employment and productivity in other industries, this would translate into 0.15 faster GDP growth each year. This number can be seen as very rough lower-bound estimate, to the extent that it is based on the assumption of no impact on other industries and no impact on employment. While the latter assumption would be reasonable had the reform been limited to employment protection, the wage moderation induced by the reform of collective bargaining is likely to result in greater employment growth, thereby raising GDP growth even further.

#### 4. Interactions with other policies

The previous section has assessed the impact of the 2012 reform of Spain's labour market legislation as has occurred so far. However, these reforms should be considered and evaluated in the broader context of structural reforms and policies in other areas. Indeed, as suggested by the *Revised OECD Jobs Strategy* (OECD, 2006), the effects of macroeconomic and structural policies are strongly interdependent and institutions should be designed and reformed in such a way to exploit their complementarity. In other words, the full materialisation of the positive employment impact of the recent labour market reform is strictly conditional on complementary reforms in other areas.

First of all, macroeconomic conditions affect overall labour market performance and the effect of the 2012 reform will depend on any macroeconomic shocks the Spanish economy might suffer. Sound macroeconomic policies are necessary to support economic and employment growth. In that respect, it is important to keep the public debt on a sustainable path, while carefully avoiding excessively restrictive fiscal stances. The pension reform proposed by the government, following the recommendations of a commission of experts, would go in this direction, as it would ensure the long-term sustainability of the pension system as well as intergenerational solidarity. Indeed the reform proposal would envisage coupling, by 2019, the introduction of a revalorisation index (*Índice de Revalorización de las Pensiones*) – guaranteeing the adjustment of pensions only conditionally on the favourable evolution of a large number of parameters – with that of a sustainability factor (*Factor de Sostenibilidad*) – linking the amount of the retirement pension to changes in life expectancy (see e.g. BBVA, 2013a).

In addition, numerous interactions exist between labour legislation and product market institutions. Reforms in the product and service markets will not only increase competition and boost productivity, but they will also have an impact on labour market performance (Blanchard and Giavazzi, 2003, Nicoletti and Scarpetta, 2005). Spain has already undertaken several reforms in 2012 and 2013 (e.g. *Programa Nacional de Reformas 2013* and the update of the Stability Program Update for Spain 2013-2016). However, it is not yet clear to what extent the fall in unit labour costs (see Section 3.1) translates into a commensurable fall of price inflation<sup>54</sup>, thereby guaranteeing a full impact of wage moderation on competitiveness. To avoid that slower wage growth results only in higher profits, without raising competitiveness, a further push on

54. For example, the average increase in wages as set in collective agreements in 2012 was 1.3% (0.9% in new collective agreements), while inflation was 2.9% (Izquierdo et al., 2013), a relative high level in comparison with Eurozone competitors. However figures for 2013 suggest that inflation is declining significantly and is now close to 0.

product and service market competition might be necessary (European Commission, 2013). Estimates by Bassanini and Duval (2009) suggest that the effect on unemployment of simultaneous reforms of anti-competitive product market regulations and industrial-relation institutions – such as the reform of collective bargaining discussed in Section 3.1 – is at least 15% larger than the sum of the effects of the two policy reforms taken in isolation.

The reform of the financial sector is currently underway and remains on track (IMF, 2013). Nevertheless, debt levels remain high and constrain the private sector's ability to borrow (La Caixa, 2013). Available evidence from other countries suggests that falling bank lending dramatically affects investment of small and medium enterprises, making their employment level slump. For example, Chodorow-Reich (2014) finds that the withdrawal of credit accounted for between one-third and one-half of the employment decline in US small and medium firms in the year following the Lehman bankruptcy. Similarly, using Italian data, Cingano et al. (2013) find that a 10 percentage-point fall in credit growth reduces the investment rate by 8-14 percentage points over four years, and employment by almost 1.5%. Restoring the health of the financial markets and easing the credit crunch is particularly important in the case of Spain, given the large share of small firms in this economy.

Another essential element to improve the functioning of the Spanish labour market and reviving employment creation relate to active labour market policies. In Spain, the administration of unemployment benefit system depends on the Spanish public employment service (SEPE) in the central government, while the development of active labour market policies is done by the regional governments (following the legislative framework approved by the central government).

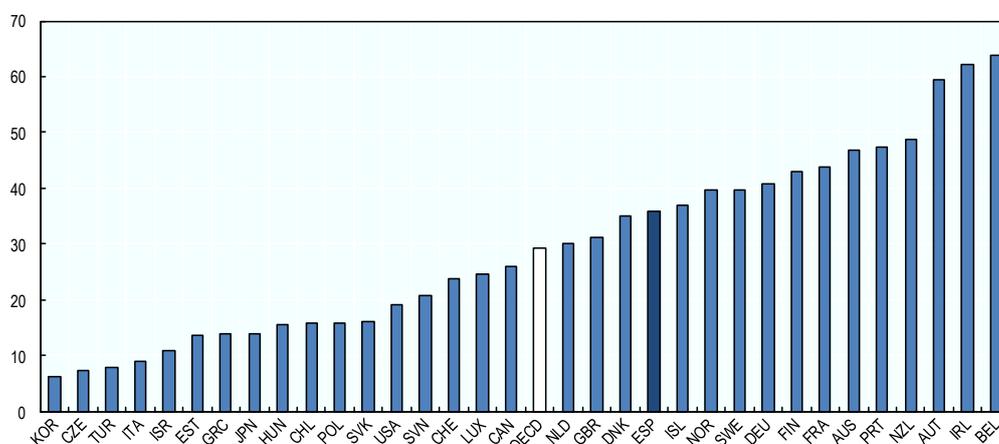
The Spanish unemployment insurance is relatively generous with respect to the OECD average (Figure 18). Providing adequate unemployment benefits can be desirable in the context of significant structural reforms: while many workers are likely to gain from these reforms, certain groups of workers would inevitably lose their jobs in their aftermath and require support to regain employment. However unemployment benefits must be made conditional on strictly-enforced work-availability conditions and included in a well-designed “activation” package. The decentralized public employment service may not have the capacity for implementing activation policies on a sufficient scale to counterbalance the potential negative effects of generous benefits on work incentives. Spain's expenditure on passive measures is around 3% of GDP (the highest level in the OECD), while expenditure on active measures is slightly below 1%,<sup>55</sup> and most of the “active” expenditures are employment incentives. More important, the plurality of actors in this area makes it difficult to integrate properly-enforced job-search requirements and effective re-employment services with the provision of adequate unemployment benefits. Last but not least, resources for preventing the receipt of benefits when in undeclared employment have always been limited in Spain.

Since the start of the recession, there has been a movement along the Beveridge curve (Figure 19), which allows identifying changes in the efficiency of the process of matching unemployed workers to vacancies – an inward shift of the curve representing an improvement in matching efficiency. The figure shows a decrease in the vacancy rate paralleled by an increase in unemployment, corresponding to the increase in labour market slack. Yet, no inward shift of the curve is detectable since the 2012 labour market reform, suggesting that inefficient activation policies are hampering the improvement in matching efficiency. In the most recent quarters, there seems to be even an outward shift denoting intensification in matching frictions, although probably due only to the simultaneous increase in long-term unemployment and the renewed firms' propensity to post vacancies (see Section 3.2).

55. Even if part of the low ratio between active and passive expenditures is due to the recession.

Figure 18. Average of net replacement rates over the first 60 months of unemployment, 2011

Unweighted average of two income levels and four family situations, excluding social assistance

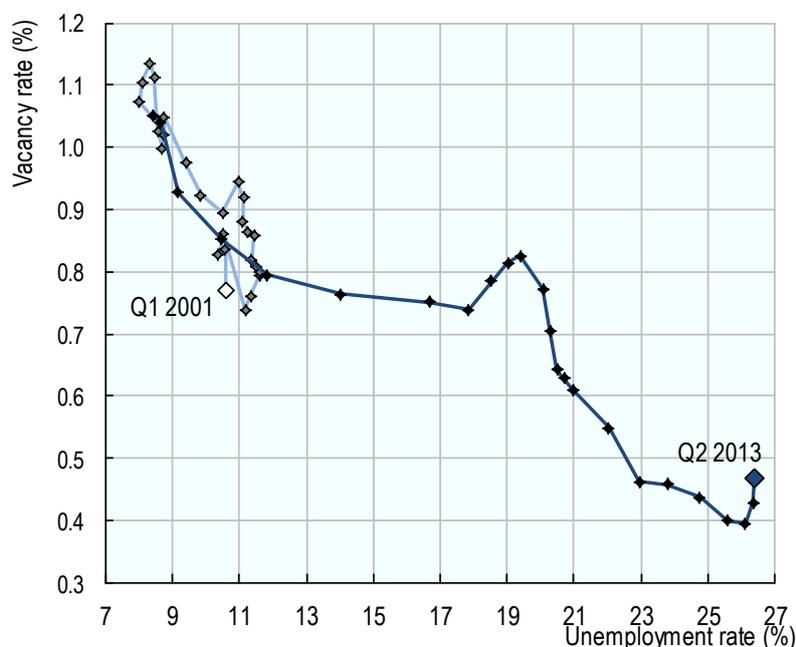


Note: Unweighted averages, for full-time earnings levels of 67% and 100% of the average wage (AW) and four family situations (single persons, couple, with two children and without). Family benefits are included. Any income taxes payable on unemployment benefits are determined in relation to annualised benefit values (i.e. monthly values multiplied by 12) even if the maximum benefit duration is shorter than 12 months. For married couples the percentage of AW relates to the previous earnings of the "unemployed" spouse only; the second spouse is assumed to be "inactive" with no earnings and no recent employment history. Children are aged four and six and neither childcare benefits nor childcare costs are considered.

Source: OECD Tax-Benefits Models.

Figure 19. The Beveridge curve in Spain

Vacancy and unemployment rates as a percentage of the labour force, Q1 2001-Q2 2013



Note: Job vacancy rates refer to the non-agricultural sector. The light blue line corresponds to the period up to 2007 Q4, while the dark blue line corresponds to the period since 2007 Q4.

Source: OECD calculations based on OECD Short-Term Labour Market Statistics Database and Eurostat, Job Vacancy Statistics.

Some improvements have taken place in the domain of activation policies. The strategy for entrepreneurship and youth employment 2013-2016 (*Estrategia de Emprendimiento y el Empleo Joven 2013-2016*) approved in February 2013<sup>56</sup> includes measures to encourage youth employment, facilitating job-placement in salaried employment as well as the start of entrepreneurship activities. For example, among the measures approved so far, new hiring incentives to employ unemployed youth have been created and a reduced flat rate for social security contributions for young entrepreneurs has been introduced. Moreover, the annual coordination mechanism between central and regional governments (*Plan anual de política de empleo 2013*)<sup>57</sup> approved in August 2013 has introduced several changes to improve the coordination between national and regional administrations. This agreement states the annual objectives of employment policies in Spain and introduces several evaluation measures of the activities performed by the regional governments. Up to 40% of the funding of active labour market policies of regional governments will be conditional on those evaluation measures. In addition, since August 2013, an individual needs to be registered as unemployed in the regional office and keep this status in order to receive and maintain the right to receive unemployment benefits.

The changes introduced in the domain of active labour market policies go in the right direction, but it remains to be seen whether they are sufficient to be effective, in particular insofar as they fall short of fully integrating active and passive policies. In the context of a prolonged recession, it is very important to focus on improving activation policies to help those unemployed to find jobs. For this, it is crucial to have the right institutional setting with effective employment services. Further in-depth analysis would be required in order to identify the possible weaknesses in the current Spanish system in the delivery and provision of income support and employment services. In particular, it will be important to ensure transparency in the monitoring of the effectiveness of regional active labour market programmes and that there are strong incentives at the local level to follow best practice. This is the case in Switzerland, for example, where cantons work under very clear guidelines and are subject to close scrutiny by the central government (see e.g. Düll et al., 2010, OECD, 2013a).

## 5. Conclusions and recommendations

The 2012 labour market reform in Spain appears to have been a significant step in the right direction. As the result of it, the Spanish labour market has already shown some signs of increased dynamism and this is likely to bring about lower dualism and faster productivity growth in the medium term. The reform focused primarily on collective bargaining and on dismissal regulations. This report provides a very preliminary assessment of the short-run effects of the reform on labour market performance. This is an important caveat insofar as: i) only a short period has elapsed since the implementation of the reform; ii) Spain is only now showing timid signs of recovery from a long recession; and iii) due to the breadth of the reform, it is difficult to clearly identify a counterfactual to carry out a standard evaluation. As a consequence, further monitoring is required to fully assess the impact of the reform in the medium and long term.

The analysis presented here confirms that, as suggested elsewhere (e.g. Izquierdo *et al.* 2013, Ministerio de Empleo y Seguridad Social, 2013, BBVA, 2013a), the effect of the reform on internal flexibility and collective bargaining has played an important role in the recent contraction of unit labour costs, although protracted adverse cyclical conditions are not alien to this pattern. It is not yet possible to say whether the reform will restore competitiveness over the medium to long term. However, the Spanish economy appears to have made progress in achieving wage moderation, which allows setting jobs in times of crisis, even if continuous monitoring of the effect of the reform in this area is advisable, and the

56. *Real Decreto-ley 4/2013*, full legislative text available at <http://www.boe.es/boe/dias/2013/02/23/pdfs/BOE-A-2013-2030.pdf>.

57. The full legislative text is available at <http://www.boe.es/boe/dias/2013/09/10/pdfs/BOE-A-2013-9464.pdf>.

government must be ready to implement further action if performance worsens. In addition, trends in income inequality should be monitored in order to guarantee that the costs and benefits of the reform are equally shared.

The analysis also shows an effect of the reform on hiring, particularly on permanent contracts, which is most likely the outcome of the relaxation of dismissal regulations. Consistently, the reform appears to have also reduced the duration of unemployment spells, essentially due to faster transitions towards a permanent contract. In addition, there are signs of a fall in the segmentation of the labour market insofar as transitions to permanent jobs have increased in particular for workers entering unemployment after a temporary contract. There is also some evidence of a reduction in separations, particularly for temporary workers, possibly resulting from the application of internal flexibility measures as an alternative to contract termination. Nonetheless, there is also evidence of a negative effect of the reform on collective dismissals, probably due to the increase in procedural uncertainty that initially followed the elimination of the administrative authorisation as well as the increase in the relative direct costs of collective dismissals with respect to individual terminations. In this respect, the government was quick to react with a mini-reform in August 2013 to reduce this uncertainty. It is too early to say whether this intervention will prove sufficient to restore outcome predictability. Yet, the discretionary role of courts to invalidate a collective-dismissal procedure and order reinstatement of workers with backpay remains large, at least on paper.

The increase of new permanent jobs is concentrated in small and medium sized employers, despite the persistent credit crunch, which is likely to affect especially this class of firms, insofar as they are more reliant on bank lending than on equity finance or corporate bonds. The greater burden on collective dismissals can be considered as one of the factors that explain why no increase in hiring is observed for large firms. Nonetheless, two other elements appear to have played a key role in determining the faster growth of open-ended contracts in small firms: i) the extension of the trial period for firms with less than 50 employees, made possible by the introduction of the *contrato de Apoyo a emprendedores*; and ii) the severance-pay subsidy, made available to firms with less than 25 employees in all cases of fair dismissal. The latter is likely to play a greater role after the 2012 reform, insofar as fair economic dismissals have become easier.

The results of the empirical analysis suggest that the reform could have contributed to 25 000 additional new permanent contracts each month and increased the share of permanent jobs in new hires by 3 percentage points. However, the share of temporary contracts in new contracts remains high. Moreover, there is some evidence that incentives to internal flexibility measures have particularly contributed to save the jobs of workers on fixed-term contracts. Thus, these pieces of evidence suggest that it may take some time before these new patterns have a visible impact on the proportion of fixed-term employees in total employment.

Whether or not the 2012 labour reform is sufficient to transform the Spanish labour market into one that combines flexibility with fairness and worker security remains to be seen. Nevertheless, to improve the likelihood that this objective will be attained, the empirical findings presented in this report suggest that further adjustments might be desirable and could be put in place at little social cost.

- First, given the evidence presented in this report, some action as regards regulation for collective dismissals could be taken. Even though it cannot be established whether the August 2013 revision is sufficient to rebalance incentives, a cautious approach would suggest reducing further the discretionary role of courts to invalidate dismissals, restricting it only to cases of discrimination and prohibited grounds – as in the case of individual terminations. In this way, unlawful collective dismissals will be treated – as in most other OECD countries – as any other type of unfair dismissal, thereby restoring the equilibrium between individual and collective dismissals. Moreover, some of the additional, specific costs for employers in the case of

collective dismissals introduced by the reform could be rolled back, notably those contributions linked to the firm's future profitability, which increase uncertainty at the time of starting the dismissal procedure about the effective financial burden to be borne by employers.

- Second, there is evidence that the trial period is still too short for most firms that are not eligible for the *contrato emprendedores*. Firms with 50 to 100 employees, not eligible for this type of contract, have increased their share of permanent contracts since the 2012 reform. However, this increase is entirely due to contract conversions, showing that these employers still tend to use fixed-term contracts as a surrogate for longer trial periods in order to screen new recruits. To the extent that dismissing non-performing or mismatched employees after the expiration of the trial period remains difficult in Spain, the government could therefore consider lengthening the maximum duration of trial periods up to at least the OECD average for firms not covered by the *contrato emprendedores*, particularly in those cases in which this duration is currently much shorter.
- Third, a greater convergence of employers' costs of termination for permanent and temporary contracts would be desirable. This will be already the case by 2015 for firms with less than 25 employees – for fair terminations – due to the severance-pay subsidy in place for these firms and the schedule of increases in severance pay for fixed-term contracts approved in 2010. By that date, for firms within this size class, severance costs borne by the employer for fair terminations at its own initiative will be equalised, no matter whether the contract is open-ended or fixed-term. The government could consider deepening this convergence process by reducing severance pay, and in particular ordinary severance costs for large employers.
- Last but not least, greater integration of active and passive policies is required in order to increase the capacity of the Spanish economy of matching the unemployed with vacancies. In this respect, a careful evaluation of recent reforms in this area is required. In particular, it will be important to ensure transparency in monitoring the effectiveness of regional active labour market programmes and that there are strong incentives to follow best practice. In addition, the introduction of a *Youth Guarantee* scheme as recommended by the European Council earlier this year for all EU countries would also be a welcome step to reduce unemployment and NEET (not in employment or education and training) rates among youth. But this will require ensuring that cost-effective public and private employment services are in place to roll out the guarantee while maintaining a high level of services for all job seekers.

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## ANNEX

### EMPIRICAL FRAMEWORK AND DETAILED ESTIMATION RESULTS

The evaluation of the 2012 Spanish labour market reform is an arduous task. First, the exercise is performed shortly after the reform. Available data cover at best 18 months in the post-reform period, but sometimes much less. Second, the inclusion of a large number of provisions, sometimes explicitly targeted at different groups, does not allow the identification of a control group. Third, the reform also occurred in the middle of a double-dip recession, at a time when the economic juncture restarted to deteriorate after a short recovery that was so hesitant that never stopped employment levels from falling. This suggests that one of the few available methods to analyse the role of the reform in the recent evolution of the Spanish labour market is through regression-discontinuity models in which the effect of the reform is identified through discontinuous patterns occurring at the time of its enforcement and the business-cycle is modelled through observable controls and non-linear time trends.

The estimation strategy followed in this report identifies the joint effect of all the provisions included in the reform by comparing labour market performance before and after February 2012. The key identification assumption is that, conditional on control variables included in the model, labour market performance evolves in a relatively smooth way, so that any discontinuous jump in performance (conditional on control variables) can be attributed to the labour market reform (and other institutional changes occurring simultaneously). The general regression-discontinuity model, which is estimated on various sets of either quarterly or monthly data, can be written as:

$$P_{it} = Y_i\beta + X_{it}\gamma + \delta I_{t>R} + \sum_{s=1}^5 \lambda_s (t-R)^s + \sum_{s=1}^5 \mu_s I_{t>R} (t-R)^s + D_t + \varepsilon_t \quad (1)$$

where  $P$  is a performance variable which can be measured at time  $t$  either at the aggregate level or at a more disaggregate level, indexed by  $i$  (such as the industry, the establishment or the individual level).  $Y$  and  $X$  are vectors of aggregate and disaggregate (if relevant) confounding factors, respectively, notably capturing composition effects, while  $R$  is the date of the reform,<sup>58</sup>  $I$  is the indicator function (which, in eq. (1) indicates the post-reform dummy),  $D$  stands for seasonal (e.g. quarterly or monthly) dummies, and Greek letters stand for parameters to be estimated, except for  $\varepsilon$ , which represents a standard error term. The parameter of interest is  $\delta$ . A significant estimate for this parameter suggests a significant impact of the reform. As suggested by Card and Lee (2008), since the identification is based on a time discontinuity, standard errors are always adjusted for clustering at least on time (and, where relevant, also on other dimensions). Moreover, probability weights are also used in order to ensure the relevance of results for the dynamics of the aggregate business sector.

Given the lack of control group and the particular time at which the reform took place (see above), properly isolating the effect of the reform from that of the business-cycle is key for the validity of the smoothness assumption. In order to capture economic fluctuations, the baseline estimation models control for the standardised unemployment rate, changes in employment registered with the general social security regime (at the regional or industry level when microdata are used) and, most importantly, polynomial time trends up to the 5<sup>th</sup> order. Baseline specifications include a polynomial trend up to the highest order  $n$  such

58. As the reform entered into force on February 12<sup>th</sup>, 2012,  $R$  is set at the beginning of 2012 in baseline specifications with quarterly data and at the beginning of March 2012 in those on monthly data (except if differently specified).

that the  $n$ -th term is not insignificant. However, except when specified otherwise, the results are robust both to changes in the order of the polynomial and to its exclusion from the specification. When a sufficiently long number of periods is available after the reform, polynomial trends are alternatively included as either homogeneous (same parameters before and after the reform) or heterogeneous (different parameters before and after the reform), the latter represented by the interaction term between  $I$  and the time trend in eq. (1). As a robustness check, employment changes are replaced with other – perhaps less endogenous – controls for the business cycle, such as changes in either industry-level value added or industry-level productivity growth (from quarterly national accounts) or the aggregate FEDEA index of economic activity. The FEDEA index is an indicator of economic activity in Spain that measures the economic cycle by using different sources of relevant information (GDP, Economic Sentiment Indicator, industrial production, car sales, electricity consumption and workers affiliated in social security)<sup>59</sup>.

Obviously, misspecification of the empirical model might lead to identify a discontinuous shift in performance around the date of a reform even when this shift occurs before the reform (and cannot therefore be attributed to it). To validate the empirical model, therefore, placebo tests need to be run. These tests consist in setting in the empirical model an earlier date than the actual reform date to estimate possible discontinuities. In practice, this means setting an earlier date  $R$  – than the actual reform date – in eq. (1) and re-estimating the equation. If discontinuous shifts in performance are really induced by the reform, then no effect should be found at these anticipated dates. This is indeed the case for all the results presented here, where placebo tests are run by anticipating the date of the reform by up to 3 quarters, in models with quarterly data, or by up to 6 months in models with monthly data.

A second issue concerns possible manipulations around the threshold. For example, if the introduction of the *contrato emprendedores* were anticipated, employers eligible for the subsidy could delay hiring from before to after the reform in order to enjoy the subsidy. However, the details and the breadth of the reform were never mentioned in the programme of the PPE before the November 2011 elections that the party won and was not made public until well after the inaugural address of Prime Minister Rajoy made in front of the parliament at the end of December 2011. It is therefore reasonable to assume that if threshold manipulation occurred, that is if firms postponed certain choices until the approval of the reform, this phenomenon concerned, at worst, only the period January-March 2012. Under these assumptions, threshold manipulation is not an issue in the regressions estimated on quarterly data because the outcome of any firm choice, which was delayed from January to March 2012, is included in the same quarter, with no effect on the average outcome of the quarter. In the case of estimates based on monthly data, baseline models are re-estimated excluding the period from January to March 2012 from the sample as an additional robustness check.

The fact that discontinuous patterns of labour market performance occurring around February 2012 are used to identify the effect of the 2012 reform makes it impossible to distinguish its impact from that of other institutional changes occurring around the same date. In particular, this is the case of the Agreement on Employment and Collective Bargaining 2012-2014, signed by the main business associations and trade unions – CEOE, CEPYME, CCOO and UGT – at the end of January 2012. This agreement promotes internal flexibility, as a mean to preserve employment, as well as commits to wage moderation and the expansion of performance-related pay.

A number of provisions, however, also either entered into force, *de jure* or *de facto*, after the date of approval of the main reform (February 2012) or were modified since then. This makes more difficult to identify unambiguously discontinuous patterns in the data. However, to the extent that the effects of subsequent policy adjustments are likely to go in the same direction of those of the February 2012 reform, results presented here are likely to represent only an underestimate of the true effect. Of course, if the direction of the impact of subsequent policy interventions were different, this argument would be invalid.

59. For further information and methodology, see [www.fedea.net/indice/indice-f.html](http://www.fedea.net/indice/indice-f.html).

This annex presents in detail methodology and empirical results dataset-by-dataset. The first section presents the analysis of the impact of the reform on labour costs, based on data from Spanish Quarterly Labour Cost Survey; the second section looks at hiring rates on the basis of data from the *Encuesta de la Poblacion Activa*; the third section studies new permanent contracts using the monthly statistics on contracts published by SEPE; the fourth examines the differential trends in collective and individual dismissals using the monthly statistics on unemployment benefits published by SEPE; the fifth studies separation rates using the Encuesta de Coyuntura Laboral; and the sixth section examines transitions from unemployment to employment using longitudinal data from the social security register.

## Labour costs

### Methodology

Unit labour costs measure the average nominal cost of labour per unit of output and are calculated as the ratio of total nominal labour costs to real output. Of particular interest for this report are wage and salary costs: the 2012 reform of collective bargaining is, in fact, expected to reduce the growth rate of nominal wage and salary costs per unit of output in times of crisis. Obviously the evolution of labour costs is strongly affected by the sectoral composition of activities. For this reason the analysis is carried out using data at the industry level (at the 1 digit of the NACE rev. 2 classification), using data from the Spanish Quarterly Labour Cost Survey and Quarterly National Accounts from the first quarter of 2005 to the second quarter of 2013 and focussing mainly on the non-agricultural business sector. However, to the extent that productivity data are not available at the same level of disaggregation (the industry classification used in the quarterly national accounts being slightly more aggregate), the wage and salary component of the harmonised index of labour costs per effective hour worked is used as dependent variable and hourly labour productivity (and/or other variables capturing it) are included as controls. One additional complication stems from seasonality: insofar as labour compensation vary significantly from one quarter to another due to the timing of payment of specific bonuses, only year-on-year changes in the harmonised index of labour costs can be meaningfully analysed. The estimated model, derived from the general one of eq. (1), can be written as

$$\Delta \log LC_{jt} = \beta_u u_t + \beta_\pi \Delta \log \pi_{jt} + \beta_c \Delta \log CPI_t + \Delta X_{jt} \gamma + \sum_{s=1}^5 \lambda_{js} (t-R)^s + \delta I_{t>R} + D_t + D_j + \varepsilon_{it}$$

where  $LC$  is the labour cost index in industry  $j$  at time  $t$  (wage costs per effective hour, adjusted for calendar days but not for seasonality),  $\pi$  is hourly productivity,  $CPI$  is the harmonised price index,  $X$  is a vector of workforce and job characteristics (the share of open-ended contracts, the share workers with less than one year of tenure, the share of three education categories, the share of four age categories, and the share of women),<sup>60</sup>  $u$  stands for the national-level standardised unemployment rate,  $R$  is the date of the reform,  $I$  is the indicator function,  $D$  stands for quarterly and industry dummies, and  $\Delta$  denotes year-on-year changes ( $t/t-4$ ). As residuals in this model are inevitably serially-correlated, errors are adjusted for clustering on both time and industry. As the reform is expected to affect the quarterly growth rate of labour costs from the first quarter of 2012, it should affect their year-on-year growth only slowly. Therefore, in contrast with other estimation exercises reported in this annex (see below),  $R$  is set at the beginning of the second quarter of 2012 in the baseline specification. Finally, the time trend is included in two alternative ways: in one series of specifications a 5<sup>th</sup>-order aggregate, homogeneous polynomial trend is included,<sup>61</sup> while in a second series a linear trend is allowed to vary across industries to capture industry heterogeneity in growth patterns. To the extent that only 5 quarters are observed where  $I$  is equal 1, the parameters of polynomial trends are not assumed to change over time.

60. These data are from the labour force survey (*Encuesta de la Poblacion Activa*, EPA).

61. The 5th order term is significant in all specifications.

## Results

Table A1 presents the key results. In the two baseline models, the impact of the reform on the growth of labour costs, conditional on productivity growth and other controls is estimated between 1.2 and 1.9 percentage points, significant at the 5% statistical level. Similar results are obtained with the following alternative specifications (not reported in the table but available upon request): i) reducing the order of the polynomial trend (or not including any trend); ii) substituting changes in industry-level log productivity with changes in either aggregate productivity or industry-level log employment, or including the latter as an additional covariate;<sup>62</sup> and iii) estimating the models with seasonally-adjusted data.

Table A1. **The effect of the reform on year growth of labour costs**

Industry-level equations, quarterly data

	Post-reform dummy	Placebo tests		
	Baseline (1)	One quarter before (2)	Two quarters before (3)	Three quarters before (4)
Model:				
5-th order polynomial	-0.019** (0.009)	-0.006 (0.011)	0.020* (0.011)	0.021 (0.013)
Industry-specific trend	-0.012** (0.005)	-0.005 (0.006)	0.004 (0.005)	0.009* (0.005)

*Note:* The dependent variable is the year-on-year quarterly change of the logarithm of the industry-level wage and salary component of the harmonised labour cost index. Each cell refers to a different specification. Robust standard errors, clustered on time and industry, in parentheses. All equations also control for the unemployment rate, change in log hourly productivity, quarter and industry dummies, changes in the log consumer price index, and changes in the industry composition of the workforce (that is, for each industry, the share of: open-ended contracts, workers with less than one year of tenure, 3 education categories, 4 age categories, and women). The post-reform dummy takes value 1 from the second quarter of 2012. In placebo tests it is replaced with a dummy taking value 1 from the fourth, third and second quarter of 2011 in columns 2, 3 and 4, respectively. \*\*  $p < 0.05$ , \*  $p < 0.1$

Placebo tests are implemented by replacing the post-reform dummy with dummies taking value 1 from the beginning of either the fourth or the third or the second quarter of 2011.<sup>63</sup> In all cases, estimates show either an insignificant or a positive and marginally significant effect of the “placebo”, therefore confirming that the estimated effects estimated in baseline models can be attributed to the reform.

## Hiring rates

### Methodology

Hiring rates are normally defined as new hires in a given period over employment in the same period. The microeconomic equivalent of this concept at the individual level is the probability of having been hired in a period of duration  $h$  before the reference week. In other words, one can estimate the effect of the

62. Short-term changes in employment and productivity are typically very strongly negatively correlated, therefore changes in the level of employment can be used to capture variations in productivity, since productivity by industry is not available at a sufficiently disaggregate level (the expected sign of the coefficient of employment is therefore negative). This allows also extending the number of covered industries. In fact, mining, water and electricity and gas are excluded from baseline specifications since productivity data are not available for these industries. When employment is also included in these specifications while already controlling for productivity changes, this is done to better control for possible worker selection.

63. Since the first quarter of 2012 is the quarter when the reform was implemented, a placebo test setting the placebo-reform dummy equal to 1 since the start of that quarter cannot be easily interpreted and is therefore not reported.

reform on the hiring rate by estimating its impact on the probability that an employee has tenure shorter than  $h$ . The following regression discontinuity model is estimated on individual quarterly data from the labour force survey (*Encuesta de la Población Activa*, EPA, cross-sectional file with a 2-digit industry classification) from the first quarter of 2008 to the second quarter of 2013:<sup>64</sup>

$$H_{ijt} = \beta_u \log u_t + \beta_e \Delta \log E_{jt} + X_{ijt} \gamma + \sum_{s=1}^5 \lambda_s (t - R)^s + \delta I_{t>R} + D_t + \varepsilon_{ijt} \quad (2)$$

where  $H$  is an indicator variable taking value 1 if the individual  $i$  in region  $j$  has job tenure lower or equal to 3 months at time  $t$ .  $H$  refers alternatively to all hires, hires on permanent contracts and hires on temporary contracts. The sample is restricted to all wage and salary employees in the non-agricultural business sector. As far as control variables are concerned,  $u$  is the quarterly standardised unemployment rate,  $E$  is regional employment,  $X$  is a vector of individual characteristics (70 2-digit industry dummies, gender, 10 age categories, 7 education categories, 10 occupational categories, and dummies for being non-native, having multiple jobs and having changed municipality in the last year).<sup>65</sup> Finally, as in eq. (1),  $R$  is the date of the reform (set at the first quarter of 2012),  $I$  is the indicator function,  $D$  stands for quarterly dummies,  $\Delta$  denotes changes and Greek letters stand for parameters to be estimated, except for  $\varepsilon$ , which represents a standard error term. Finally, a 4<sup>th</sup>-order aggregate homogeneous polynomial trend is included,<sup>66</sup> in baseline specifications. To the extent that only 6 quarters are in the post-reform sample, the parameters of the polynomial trends are not assumed to change over time.

## Results

Baseline estimates, reported in Table A2 suggest that the 2012 reform increased the hiring rate – measured as the proportion of employees with 3 month of tenure or less – by about 8% (that is a percentage-point marginal effect of 0.64 percentage points). With a 13% increase (corresponding to a percentage-point marginal effect of 0.14 percentage points), the estimated percentage effect is larger in the case of hiring on open-ended contracts. Very similar results – in percentage terms – are obtained if the sample is restricted to employees with an open-ended contract only. A somewhat stronger effect is estimated in the case of hiring on open-ended full-time contracts – 18% increase – corresponding to a percentage-point marginal effect of 0.16 percentage points). By contrast, the estimated percentage effect is much smaller in the case of hiring on temporary contracts, with a 7% increase (corresponding to a percentage-point marginal effect of 0.5 percentage points).

All the results presented in Table A2 are robust to i) specifying eq. (2) as a probit model instead of a linear probability model; ii) increasing the order of the polynomial trend<sup>67</sup> (or not including any trend);<sup>68</sup> iii) substituting changes in regional employment with, alternatively, changes in industry real value added or changes in unemployment rates; and iv) excluding all aggregate controls except polynomial time trends from the specification. By contrast, the only exception is the result on hiring on fixed-term contract, which is not robust to the exclusion of the polynomial trend.

64. The sample is limited to this period due to the change in industry classification that occurred between 2007 and 2008.

65. All individual data are from EPA.

66. The 4-th order term is significant in all specifications.

67. Although higher-order terms turn out to be statistically insignificant.

68. However, if a lower-order polynomial trend is included, the effect of the reform on the hiring rate of permanent workers is insignificant, although still positive.

Table A2. The effect of the reform on the probability of having tenure shorter than three months

Individual-level equations, quarterly data					
Dependent variable	(1) Hired	(2) Hired, permanent	(3) Hired, permanent	(4) Hired, full-time, Permanent	(5) Hired, fixed-term
Post-reform dummy	0.00646*** (0.00185)	0.00135** (0.00061)	0.00183** (0.00080)	0.00156** (0.00062)	0.00511** (0.00192)
Sample restricted to perm. workers	No	No	Yes	No	No
Observations	712,393	712,393	551,429	712,393	712,393
R-squared	0.066	0.004	0.012	0.004	0.067

Note: Hired stands for a dummy indicating that the worker has been hired in the three months preceding the reference week. Robust standard errors, clustered on time, in parentheses. All equations control for the unemployment rate, change in regional employment, quarterly dummies, a 4<sup>th</sup> order polynomial in time (quarters), 70 2-digit industry dummies, gender, 10 age categories, 7 education categories, 10 occupational categories, and dummies for being non-native, having multiple jobs and having changed municipality in the last year. \*\*\* p<0.01, \*\* p<0.05.

Placebo tests are then run for all specifications by “anticipating” the date of the reform by up to 3 quarters (Table A3). None of the placebo effect is significantly positive. However for both total hiring and, in particular, hiring on temporary contracts, placebo effects are significantly negative. This suggests some possible misspecification of the business-cycle component, so that the attribution of the increase in hiring on temporary contract to a genuine effect of the reform must be considered more uncertain.

Table A3. The effect of different placebos on the probability of having tenure shorter than three months

Individual-level equations, quarterly data					
Dependent variable	(1) Hired	(2) Hired, permanent	(3) Hired, permanent	(4) Hired, full-time, Permanent	(5) Hired, fixed-term
Placebo:					
1 quarter before	-0.00073 (0.00332)	0.00028 (0.00086)	0.00041 (0.00114)	0.00063 (0.00084)	-0.00101 (0.00293)
2 quarters before	-0.00447** (0.00200)	0.00028 (0.00078)	0.00028 (0.00102)	0.00058 (0.00074)	-0.00474*** (0.00140)
3 quarters before	-0.00615*** (0.00156)	-0.00142* (0.00077)	-0.00192* (0.00104)	-0.00122 (0.00086)	-0.00473*** (0.00152)
Sample restricted to perm. workers	No	No	Yes	No	No

Note: Hired stands for a dummy indicating that the worker has been hired in the three months preceding the reference week. Each cell refers to a different specification. Robust standard errors, clustered on time, in parentheses. All equations control for the unemployment rate, change in regional employment, quarterly dummies, a 4<sup>th</sup> order polynomial in time (quarters), 70 2-digit industry dummies, gender, 10 age categories, 7 education categories, 10 occupational categories, and dummies for being non-native, having multiple jobs and having changed municipality in the last year. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## New permanent contracts

The monthly statistics on contracts, published by SEPE, allows replicating and deepening the analysis of hiring on permanent contracts. In fact, while EPA covers a sample of few tenth of thousands employees and is available only at the quarterly base, contract statistics are published monthly and are based on compulsory administrative declarations from all employers and therefore cover the entire population. In

addition a breakdown of new contracts is available by firm size, which is important given that certain provisions of the 2012 reform are applicable only to firms below a certain size threshold.

### Methodology

In order to assess the impact of the reform on hiring on permanent contract, the following class of regression-discontinuity models is estimated, using on aggregate monthly data for the period January 2006–July 2013:

$$\log NP_t = \beta_u u_t + \beta_d \Delta u_t + X_t \gamma + \sum_{s=1}^5 \lambda_s (t - R)^s + \delta I_{t>R} + \sum_{s=1}^5 \mu_s I_{t>R} (t - R)^s + D_t + \varepsilon_t \quad (3)$$

where  $NP$  is the number of new permanent contracts at time  $t$ ,  $u$  is the monthly standardised unemployment rate,  $X$  is a vector of variables capturing workforce composition of new hires (shares of 3 education categories, 5 age categories and women),  $R$  is the date of the reform,  $I$  is the indicator function,  $D$  stands for monthly dummies,  $\Delta$  denotes changes and Greek letters stand for parameters to be estimated. All data are from the monthly statistics on contracts published by SEPE, except for the unemployment rate. As the identification is based on a time discontinuity, standard errors are adjusted for clustering on time. Finally, a 5<sup>th</sup>-order aggregate polynomial trend is included, in baseline specifications.<sup>69</sup> Since 18 observations are available in the post-reform period, the time trend is alternatively specified as homogeneous (same parameters before and after the reform) and heterogeneous (different parameters before and after the reform).

Eq. (3) is estimated for the whole economy and then separately for firms above and below the threshold of 50 employees (since only firms below the threshold are eligible for the *contrato emprendedores* introduced by the reform). Then, both groups of firms (above and below this threshold) are divided further into those with size above and below 25 employees and those of size above and below 100 employees.

### Results

As shown in Table A4, the 2012 reform increased hiring on regular open-ended contracts by 20%-30%. If firms are split in two subsamples – those with 50 or fewer employees and those with more than 50, no significant increase is observed for the largest firms. By contrast, no matter how the time trend is specified, the reform is estimated to have increased the number of new contracts by about 42%, and this estimated impact is always significant at the 1% level. For these two groups of firms the predicted effect of the reform is plotted in Figures A1 and A2. For firms with 50 or fewer employees, the baseline model with homogeneous time trend predicts that the reform raised the number of new open-ended contracts by at least 25 000 units, while no effect is detectable for larger firms. These trends are also reflected in the evolution of the share of regular open-ended contracts in total hiring, which is estimated to have been raised by about 3 percentage points (or about 30%) in firms with 50 or fewer employees, while no significant effect emerges for larger firms.<sup>70</sup>

69. The 5-th order term is significant in all specifications.

70. These figures (not shown in the table) are obtained by replacing the log of the number of new contracts with the share of permanent contracts in new hires in eq. (3). All results presented here are robust if the share of regular open-ended contracts in total hiring is used as dependent variable instead of the number of open-ended contracts.

Table A4. The effect of the reform on new permanent contracts

Panel A. Homogeneous trend, monthly data							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample (firm size)	All	1to50	>50	1to25	26to50	51to100	>100
Post-reform dummy	0.217* (0.124)	0.421*** (0.110)	0.132 (0.084)	0.463*** (0.109)	0.281*** (0.095)	0.231** (0.103)	0.067 (0.080)
Observations	91	91	91	91	91	91	91
R-squared	0.957	0.949	0.970	0.946	0.959	0.953	0.972

Panel B. Heterogeneous trend							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample (firm size)	All	1to50	>50	1to25	26to50	51to100	>100
Post-reform dummy	0.334*** (0.108)	0.424*** (0.101)	0.150 (0.116)	0.456*** (0.0942)	0.266* (0.136)	0.286** (0.117)	0.099 (0.127)
Observations	91	91	91	91	91	91	91
R-squared	0.965	0.959	0.971	0.956	0.966	0.960	0.973

Note: Dependent variable: logarithm of new open-ended contracts. Robust standard errors, clustered on time, in parentheses. Each equation includes level and changes in the standardised unemployment rate, the shares of 3 education categories, 5 age categories and women in new contracts and a 5-th order polynomial trend in time (months), which in Panel B is assumed to differ between before and after the reform. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

When the data are further disaggregated by firm size, the greatest estimated expansion in the number of new permanent contracts induced by the reform is found in very small firms with 25 employees or less (45%-46%; see Table A4). In firms between 26 and 100 employees the effect is somewhat more limited. The reform is estimated to have raised the number of new permanent contracts by 26%-28% in firms with 26 to 50 employees and by 23%-28% in firms with 51 to 100 employees. By contrast, no significant effect is observed for larger firms.<sup>71</sup>

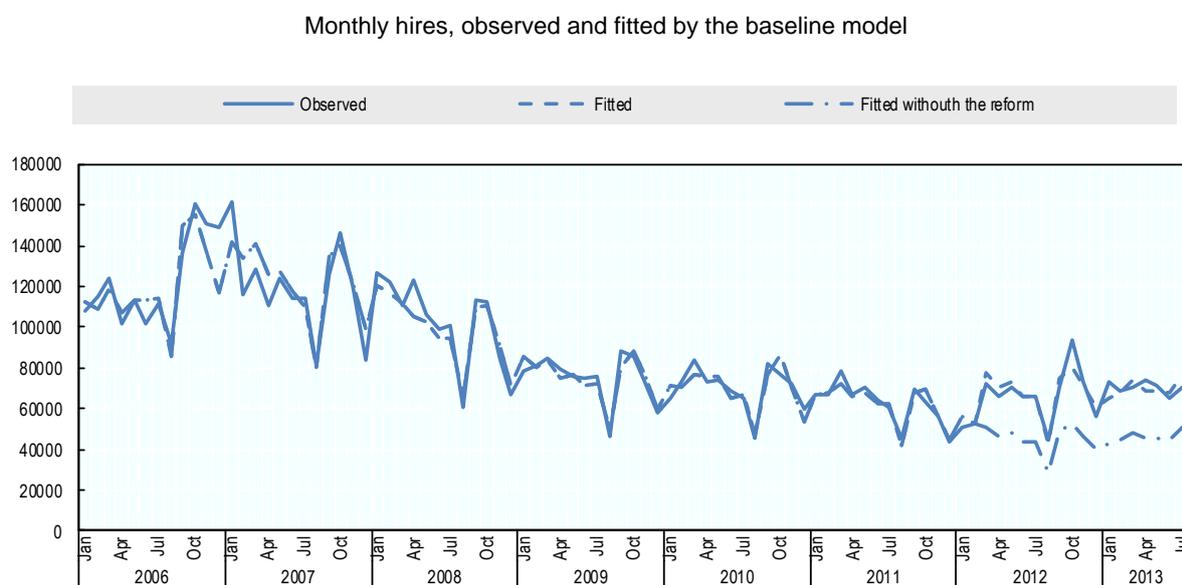
All the results presented in Table A4 are robust to i) changing the order of the polynomial trend (or not including any trend); ii) excluding workforce controls; iii) substituting polynomial trends with year dummies; iv) substituting changes in the unemployment rate with either changes in the FEDEA index or the logarithm of employment as measured by the number of workers enrolled in the general social security regime; and v) excluding all aggregate controls except polynomial time trends from the specification.

Placebo tests are then run for all specifications by “anticipating” the date of the reform by up to 6 months. Table A5 presents the results for the case of homogenous time trends. Results are however similar in the case of heterogeneous trends and/or if changes in the unemployment rate are replaced by

71. No matter how the time trend is specified, the effect on firms with 25 employees or less appears also significantly larger than that of firms with 26 to 50 employees. Similarly the effect on firms with more than 100 employees appears significantly smaller than that of 51 to 100 employees. By contrast, the difference in the estimated impact between firms with 26 to 50 employees and 51 to 100 employees is statistically insignificant at conventional levels.

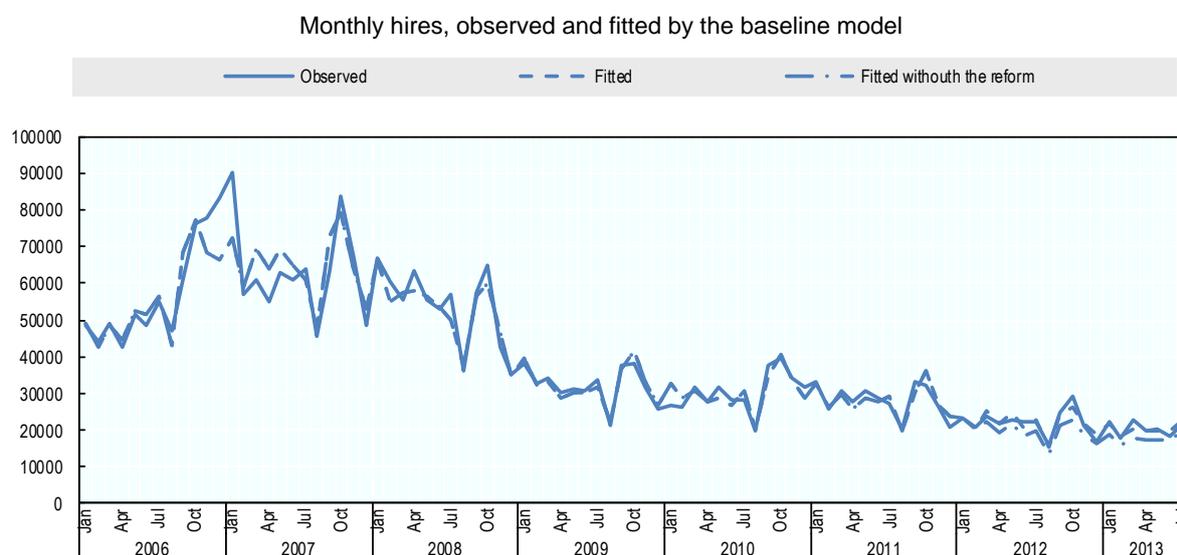
changes in the FEDEA index. In all cases where a significant effect of the reform is estimated with eq. (3), placebo tests show no significant effect if the date of the reform is set at the beginning of January 2012 or before. This suggests that the estimated effects in Table A4 can be genuinely attributed to the reform.

Figure A1. **New hires with a permanent contract in firms with 50 or fewer employees, 2006-2013**



Note: The figure presents the number of new permanent contracts signed each month, as observed in raw data and as fitted using estimates of Table A4, Column 2 (including netting out the effect of the post-reform dummy).

Figure A2. **New hires with a permanent contract in firms with more than 50 employees, 2006-2013**



Note: The figure presents the number of new permanent contracts signed each month, as observed in raw data and as fitted using estimates of Table A4, Column 3 (including netting out the effect of the post-reform dummy).

Table A5. The effect of different placebos on new permanent contracts

Homogeneous trend, monthly data							
Sample (firm size)	(1) All	(2) 1to50	(3) >50	(4) 1to25	(5) 26to50	(6) 51to100	(7) >100
Placebo:							
Placebo-reform Jan 12	-0.030 (0.090)	0.034 (0.110)	0.066 (0.084)	0.043 (0.112)	0.004 (0.118)	-0.008 (0.113)	0.070 (0.089)
Placebo-reform Dec 11	-0.061 (0.090)	-0.044 (0.101)	-0.049 (0.089)	-0.046 (0.099)	-0.104 (0.114)	-0.155 (0.105)	-0.016 (0.084)
Placebo-reform Aug 11	-0.119 (0.090)	-0.135 (0.084)	-0.123 (0.081)	-0.146* (0.079)	-0.135 (0.122)	-0.193* (0.107)	-0.061 (0.069)

Note: Dependent variable: logarithm of new open-ended contracts. Each cell refers to a different specification. Robust standard errors, clustered on time, in parentheses. Each equation includes level and changes in the standardised unemployment rate, the shares of 3 education categories, 5 age categories and women in new contracts and a 5-th order polynomial time trend, which in Panel B is assumed to differ between before and after the reform. \* p<0.1

A breakdown by type of transition is also available in the data, which allows estimating eq. (3) separately for new employment relationships and conversions of temporary contracts into open-ended ones (Table A6).

Table A6. The effect of the reform on new permanent contracts, by type of transition

Panel A. Conversions							
Sample (firm size)	(1) All	(2) 1to50	(3) >50	(4) 1to25	(5) 26to50	(6) 51to100	(7) >100
Post-reform dummy	0.159 (0.182)	0.306* (0.163)	0.213* (0.123)	0.325** (0.162)	0.266* (0.136)	0.387** (0.161)	0.121 (0.102)
Observations	91	91	91	91	91	91	91
R-squared	0.925	0.924	0.921	0.919	0.931	0.907	0.924

Panel B. New employment relationships							
Sample (firm size)	(1) All	(2) 1to50	(3) >50	(4) 1to25	(5) 26to50	(6) 51to100	(7) >100
Post-reform dummy	0.240*** (0.090)	0.498*** (0.098)	0.046 (0.075)	0.562*** (0.103)	0.267*** (0.058)	0.041 (0.072)	0.012 (0.083)
Observations	91	91	91	91	91	91	91
R-squared	0.972	0.963	0.982	0.957	0.976	0.975	0.979

Note: Dependent variable: logarithm of new open-ended contracts, by type, estimated on monthly data. Robust standard errors, clustered on time, in parentheses. Each equation includes level and changes in the standardised unemployment rate, the shares of 3 education categories, 5 age categories and women in new contracts and a 5-th order, homogeneous polynomial time trend, which in Panel B is assumed to differ between before and after the reform. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

As far as conversions are concerned the effect of the reform is the greatest for firms with 51 to 100 employees (with a 39% estimated increase) followed by those with 1 to 25 employees (32% increase). However, while for the latter the estimated increase in new open-ended employment relationships is much

larger (56% increase), there is essentially no effect on these for the former. As regards firms with 26 to 50 employees the effect of the reform appears similar on both conversions and new open-ended employment relationships (about 27% in both cases), although less precisely estimated for the former.<sup>72</sup>

### Collective and individual dismissals

Inflows onto unemployment benefits, by reason of inflow, are a reliable source of data to distinguish the effect of the 2012 reform on individual and collective dismissals.<sup>73</sup>

### Methodology

The same class of regression-discontinuity models used in the previous section for new contracts (eq. 3) can be used to estimate the impact of the reform on the number of individual and collective dismissals, using on aggregate monthly data (January 2007-July 2013). Three differences are however in order: i) the dependent variable in this case will be replaced by either the logarithm of monthly inflows onto unemployment benefits due to, alternatively, collective or individual dismissals or the share of inflows due to collective dismissals in total inflows due to dismissals; ii) the logarithm of inflows due to other reasons than that those measured in the dependent variable replaces changes in the unemployment rate (since the former seems more appropriate in this case); and iii) to the extent that this model is used to study mainly collective dismissals and at least one-month consultations with trade-unions are required by post-reform regulations in the case of collective dismissals, the post-reform dummy takes value one only one-month after the reform (therefore taking value 1 from April 2012).<sup>74</sup> All data are from the monthly statistics on unemployment benefits (*Prestaciones por desempleo*) published by SEPE. Inflows by dismissal exclude those resulting from conciliation settlements, court rulings or contract suspensions, but include those ex ley 45/2002 (individual dismissals for which benefits are claimed before that a court can rule whether the dismissal is fair or unfair). Inflows data considered here are limited to workers who are eligible to standard unemployment benefits because of sufficient previous contributions and contribution periods (*Prestaciones de nivel contributivo*). They exclude, therefore, workers eligible only for other type of unemployment-related subsidies (*Prestaciones de nivel asistencial*). Since published data do not contain a breakdown of inflows by workers' characteristics, these controls are not included. As the identification is based on a time discontinuity, standard errors are adjusted for clustering on time.

In order to capture the business-cycle (over and above levels of the unemployment rate and other inflows onto unemployment benefits), models of the type of eq. (3) include a polynomial trend up to 5<sup>th</sup> order, which can be either homogeneous (same parameters before and after the reform) or heterogeneous (different parameters before and after the reform) depending on the specification. The baseline specification includes a homogeneous polynomial trend up to the highest order  $n$  such that the  $n$ -th term is not insignificant (in practice, the 2<sup>nd</sup> order in the case of the number of collective dismissals, the 3<sup>rd</sup> order in the case of its share and the 5<sup>th</sup> order in the case of individual dismissals).

### Results

Taking baseline estimates with homogeneous trends at face value, the 2012 reform is estimated to have reduced inflows onto unemployment benefits for reasons of collective dismissals by about 32%

72. Similar estimates are obtained by using heterogeneous trends and/or replacing changes in unemployment with changes in the FEDEA index.

73. However, it must be kept in mind that available data are limited to workers who have sufficiently long contribution histories to be eligible for unemployment benefits.

74. This seems appropriate to minimise the risk of counting as subsequent to the reform dismissals that were originated by a collective-dismissal procedure which in fact started before the reform.

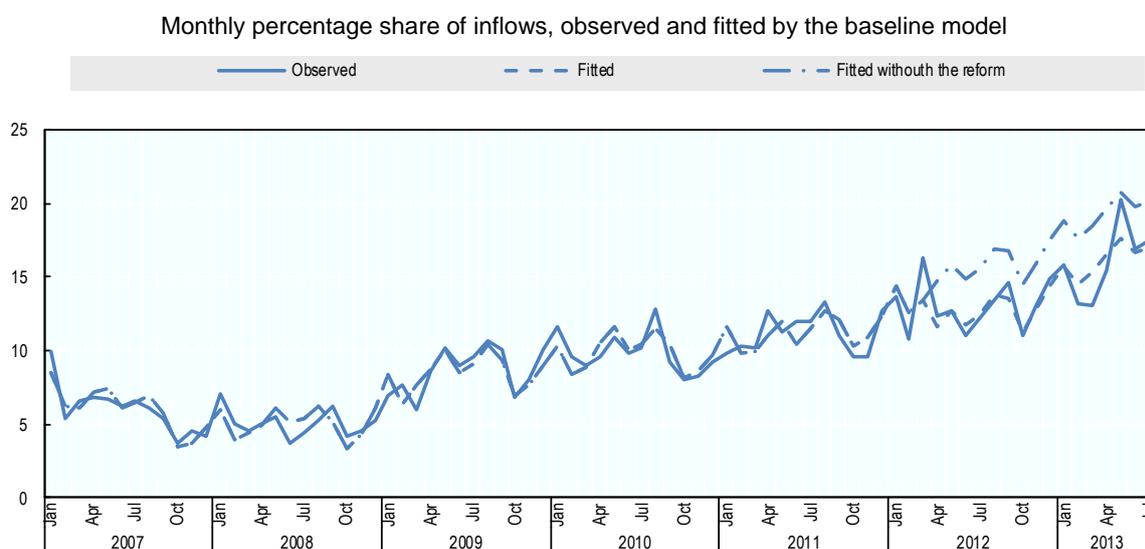
(Table A7). By contrast, individual dismissals decreased by about 6% only. Moreover, this effect is significant only at the 10% level. Results are similar with heterogeneous trends (not shown in the table). This evolution is reflected in the estimated effect of the share of collective dismissals in total dismissals (see also Figure A3). In fact, the reform is estimated to have reduced this share by about 3.1 percentage points (that is about 30%).

Table A7. **The effect of the reform on inflows onto unemployment benefits due to dismissal**

Monthly data, homogeneous trends			
Dependent Variable	(1) Log Collective dismissals	(2) Log Individual dismissals	(3) Share Collective dismissals
Post-reform dummy	-0.316*** (0.084)	-0.060* (0.035)	-3.146*** (0.856)
Observations	79	79	79
R-squared	0.948	0.964	0.928

Note: Dependent variable: Columns 1 and 2: logarithm of inflows onto unemployment benefits for the reason indicated in the column title; Column 3: share of collective dismissals in inflows due to any type of dismissal. All equations control for the unemployment rate, a polynomial trend in time (months) and inflows in unemployment benefits for reasons different from those reported in the column title. A 2<sup>nd</sup>-order polynomial is included in Column 1, a 5<sup>th</sup>-order polynomial in Column 2 and 3<sup>rd</sup>-order polynomial in Column 3. Robust standard errors, clustered on time, in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure A3. **Share of inflows onto unemployment benefits due to collective dismissal in total inflows due to dismissal, 2007-2013**

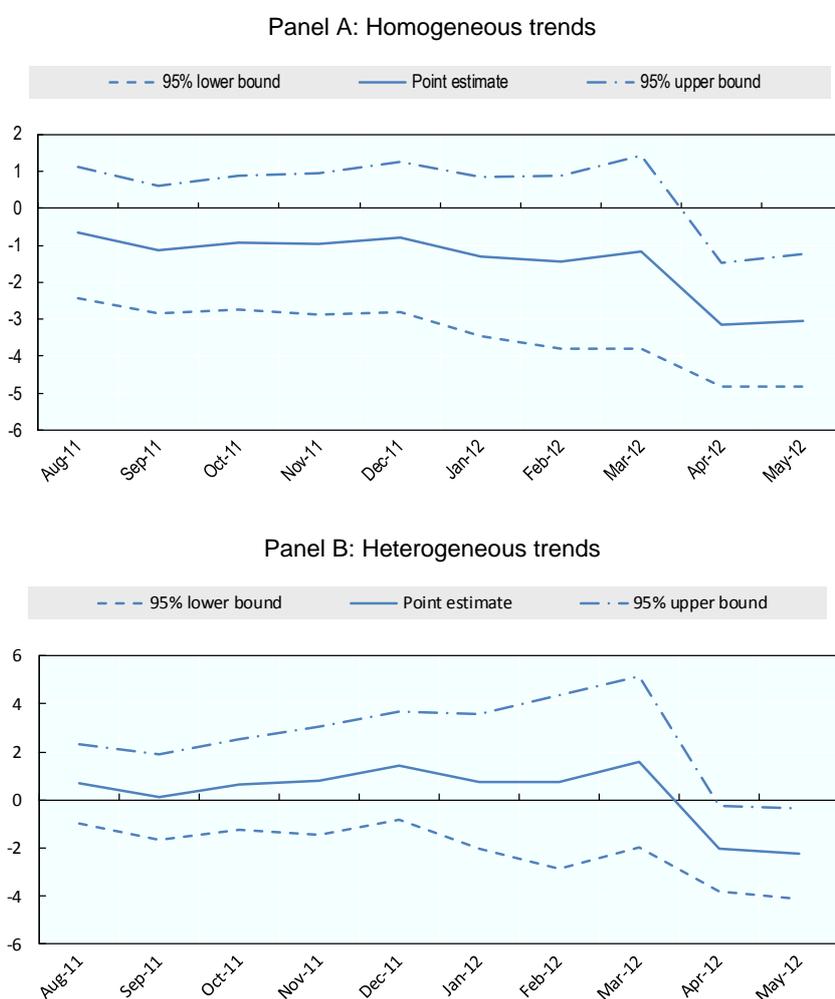


Note: The figure presents the monthly percentage share of inflows in unemployment benefits due to collective dismissal in total inflows due to dismissal, as observed in raw data and as fitted using estimates of Table A7, Column 3 (including netting out the effect of the post-reform dummy)..

Results on collective dismissals are robust to i) substituting homogeneous trends with heterogeneous trends; ii) changing the order of the polynomial trend (or not including any trend);<sup>75</sup> and iii) replacing changes in the unemployment rate with changes in the FEDEA index. By contrast, results on individual dismissals are sensitive to the specification of the polynomial trend. In fact, if a 2<sup>nd</sup> or 3<sup>rd</sup>-order polynomial is specified, the point estimate is even positive, although insignificant.

Placebo tests are then run for all specifications by “anticipating” the date of the reform by up to 6 months. Figure A4 presents the results for the share of collective dismissals. It turns out that if the the date of the “placebo-reform” is set even one single month before, its estimated effect would be insignificant, no matter whether the trend is modelled as homogeneous or heterogeneous. This suggests that the estimated effects in Table A4 can be genuinely attributed to the reform.

Figure A4. **The effect of different placebos on the share of inflows onto unemployment benefits due to collective dismissals**



*Note:* The figure reports estimated coefficients and confidence interval obtained by estimating the specification reported in Table A7, Column 3, substituting the post-reform dummy with a dummy taking value 1 from the indicated dates. Apr-12 corresponds to the estimated effect of the true reform (measured through the coefficient of the post-reform dummy).

75. However, the effect on the share of collective dismissals become insignificant is no trend (or a linear, homogeneous trend) is included.

## Worker separations at the establishment level

### Methodology

Worker separations at the establishment level are analysed using the *Encuesta de Coyuntura Laboral* (ECL), an establishment-level<sup>76</sup> survey that follows establishments over time and registers its worker flows. Around 12,800 establishments are surveyed each quarter. This sample is representative of all establishments in the private sector and covers all workers registered in the General Regime of the Spanish Social Security Register (as well as those in the Special Mining Regime).

Separation rates at the establishment level are defined as the number of separations in each quarter divided by the average of total employment between the start and the end of the period at each establishment. Separation rates are computed both for full-time and part-time employment, and distinguishing between those separations that are due to end of contract for temporary workers, due to dismissals of permanent workers, due to end of season for seasonal workers with an open-ended contract – “*fijos discontinuos*” – and due to other reasons (including retirements, voluntary separations, deaths, etc.).<sup>77</sup>

The following regression discontinuity model is estimated on quarterly establishment-level data from ECL for the period 2006 to 2012, for which micro data are available:

$$SR_{jt} = \alpha \log u_t + \beta \Delta \log E_{jt} + F_{jt} \gamma + \sum_{s=1}^5 \lambda_s (t - R)^s + \delta I_{t>R} + Q_t + \mu_j + \varepsilon_{jt} \quad (4)$$

where  $SR$  corresponds to the separation rate of the establishment  $j$  in quarter  $t$ .  $SR$  refers alternatively to separation rates of all workers, of full-time/part-time as well as separation rates due to end of contract, dismissals, end of season and other reasons. The sample is restricted to all establishments in the private sector with at least ten workers on average for the whole period they are observed in the data. The estimation has as cyclical controls the quarterly standardised unemployment rate at the national level ( $u$ ) and the change in employment level (in logs) at the regional level ( $\Delta \log E$ ). In addition, several establishment characteristics  $F$  are included: industry, establishment size, region as well as average age and qualification structure in each sector in the region (extracted from LFS data).  $R$  is the date of the reform,  $I$  is the indicator function,  $Q$  stands for quarterly dummies, and  $\Delta$  denotes changes. Greek letters stand for parameters to be estimated, except for  $\varepsilon$  which represents a standard error term. The standardised unemployment rate is from OECD labour market statistics, while regional employment is measured by the number of workers enrolled in the general social security regime. Establishment fixed-effects  $\mu$  are included in fixed-effects regressions. As the identification is based on a time discontinuity, standard errors are adjusted for clustering on time.

An additional variable is added to control for the share of permanent (and temporary) contracts in the establishment, which is important when differentiating between types of separations. The results are robust to the inclusion of this variable.

76. The unit of observation is the social security account number (*Cuenta de Cotización*), which is unique for each firm at the provincial level. It does not correspond exactly to the plant or the firm level (as those firms established in different provinces are not linked), although for a matter of simplicity we will refer to each social security accounting unit as an “establishment”, hereafter. For each *Cuenta de Cotización*, it is possible to identify if the account corresponds to establishments with only one or several plants in the same province. Almost 90% of the observations have only one plant.

77. The separation rate of each type of workers (full/part-time, etc) is defined as the ratio between the number of separations of each type of workers divided by the average of total employment between the start and the end of the period at the establishment.

The estimation of equation (4) is performed using ordinary least squares as well as fixed-effect models<sup>78</sup> for all establishments in the private sector with more than 10 employees. The equation is also estimated for small establishments with less than 50 employees only, with similar results. Results shown include a polynomial time trend up to the 5<sup>th</sup> order but are robust to changing the order of the polynomial time trend.

## Results

The baseline results (see results in Table A8) suggest that the 2012 reform significantly reduced the share of workers leaving the establishment in a given quarter. The estimated coefficient for the overall separation rate implies that the reform reduced overall separation rates by about 24%, although the exact point estimates differ slightly depending on the specification. The effect of the reform has been particularly sizeable for part-time workers (for which separation rates are 41% lower due to the reform).

Table A8. The effect of the reform on separation rates at the establishment level

Quarterly data				
	Post-reform dummy	Placebo tests		
	Baseline	One quarter before reform	Two quarters before reform	Three quarters before reform
	(1)	(2)	(3)	(4)
Separation rates:				
Overall	-0.018*** (0.006)	-0.010* (0.006)	0.005 (0.006)	0.006 (0.005)
Full-time	-0.006* (0.003)	-0.004 (0.003)	0 (0.004)	0.003 (0.003)
Part-time	-0.010** (0.004)	-0.007 (0.005)	0.008 (0.005)	0.005 (0.004)
End of Contract	-0.016** (0.006)	-0.016** (0.008)	0.017** (0.008)	0.013* (0.006)
Dismissal	-0.002 (0.001)	-0.002** (0.001)	-0.001 (0.001)	0.002* (0.001)
End of Season	-0.009** (0.004)	-0.008 (0.005)	0.013*** (0.004)	0.009** (0.004)
Other	0.001 (0.002)	0.003** (0.001)	0 (0.002)	-0.002 (0.001)

Note: Each cell corresponds to the OLS coefficient of the post-reform (or the placebo test) dummy from a regression with each separation rate as dependent variable. All equations control for the unemployment rate, change in regional employment, a 5<sup>th</sup> order polynomial in time (quarters), establishment size, quarterly dummies, age and education composition of the establishment workforce and region and sector dummies. Robust standard errors, clustered on time in parentheses. \*\*\*, \*\*, \*: significant at the 1%, 5% and 10% level, respectively.

In addition, establishment-level data allows disaggregating flows by contract type and reason of separation. The results point to a significant impact of the reform on separation rates due to the end of contract for temporary workers (for which separation rates decreased by 31%) and for seasonal workers

78. Alternatively, the estimation of equation (4) using a Tobit model is performed and similar results as OLS are found. In addition, substituting separation rates by the log of the absolute value of separations does not modify the results significantly.

(71% decrease), but show no impact on dismissal rates and separations for other reasons. An impact of the reform decreasing separation rates is still found when controlling for individual establishment effects, although the effect is not significant (not shown in the table), suggesting that the reform affected separation rates mainly by changing the composition of establishments.

Placebo tests are run for all the estimations by “anticipating” the date of the reform for up to 3 quarters. This is equivalent to substituting the date of the reform  $R$  by an earlier date and re-estimating the equation (4). The coefficient of the placebo reform, when the its date is set just one quarter before the true reform, is still negative and significant at the 5% for the separation rate due to the end of contract for temporary workers, suggesting caution in the interpretation of the baseline estimates as regards this covariate. Other placebo tests corresponding to two and three quarters before the reform show no significant effect for all the estimations, except for a positive and significant one in the cases of end of contract and end of season, which again suggests caution in interpreting the baseline results concerning these variables.

An additional robustness test has been undertaken by replacing the change in log regional employment ( $\Delta \log E$ ) by the FEDEA index of economic activity. The results are not sensitive to using one or the other indicator of the economic cycle.

## Transitions from unemployment to employment

### Methodology

Transitions from unemployment to employment are analysed using the *Muestra Continua de Vidas Laborales* (MCVL). This longitudinal dataset from social security registers covers employment histories of over one million individuals, making it a very good data source to study worker transitions out of unemployment. The MCVL covers around one in twenty persons registered in the social security and is representative of the whole population that had a relationship with social security in a given year<sup>79</sup>. These data are used to study the impact of the reform on the hazard rate out of unemployment using a discrete-time competing-risk duration model. The empirical strategy followed is similar to the one followed in García-Pérez and Muñoz-Bullón (2011).

The probability of exiting unemployment after a spell of duration  $d$  to enter either temporary employment or permanent employment is simultaneously estimated for the two types of exits within a competing-risk framework. Both possible transitions are modelled using a logistic distribution as given by:

$$\begin{aligned} \Pr(U_{it} = d, L_{it} | U_{it} \geq d) = & \\ & F(\alpha_0 + \alpha_1 \ln(U_{it}) + \alpha_2 \ln(U_{it})^2 + \alpha_3 \ln(U_{it})^3 + \alpha_4 X_{1it} + \alpha_5 X_{2it} + \alpha_6 X_{1it} * \ln(U_{it}) + \\ & + \alpha_7 \text{PrevEmpl}_{it} + \gamma \log u_t + \beta_1 \Delta \log E_{jt} + \beta_2 \Delta \log E_{jt} * \ln(U_{it}) + \sum_{s=1}^3 \lambda_s (t - R)^s + \delta I_{t > R} + m_t) \end{aligned} \quad (5)$$

where  $U$  refers to the duration of the unemployment spell, which ends at time  $t$  for the worker  $i$ ,  $L$  is after-transition employment contract-type (permanent or temporary) and  $X_1$  refers to the following individual characteristics: age and education categories and an indicator of whether the individual receives unemployment benefits or not. These are also included in interaction with the duration of the unemployment spell.  $X_2$  stands for controls for gender, migrant status and region, while *PrevEmpl* for characteristics of the previous job (sector, type of contract, and if the individual was dismissed or not) as

79. See García-Pérez (2008) for further details on the MCVL data and its usefulness to study labour market transitions.

well as the number of times the individual has been unemployed and the percentage of time he has been employed throughout his labour market career. Specifications include also as cyclical controls the monthly unemployment rate at the national level ( $u$ ) and the change in log employment at the provincial level ( $\Delta \log E$ ). However, in order to capture the business-cycle (over and above control variables), models of the type of eq. (5) include a polynomial trend up to the highest order  $n$  such that the  $n$ -th term is not insignificant (in practice, the 3<sup>rd</sup> order or 5<sup>th</sup> order depending on the specification). Finally,  $R$  is the date of the reform,  $I$  is the indicator function,  $m$  stands for monthly dummies, and  $\Delta$  denotes changes. Greek letters stand for parameters to be estimated. In order to distinguish the estimated impact of the reform between large and small establishments (to capture threshold effects) a four-fold competing-risk model is also estimated, with four possible exiting states (permanent/temporary in large/small establishments).<sup>80</sup>

Equation (5) is estimated for a sample of Spanish workers aged 16-64 during the period 2003-2012 (2006-2012 for the subsample differentiating by establishment size). Transitions from unemployment to employment are conditional on being unemployed for at least one day and durations are censored at 30 months of unemployment – that is, those spells lasting more than 30 months are considered to be censored at the 30<sup>th</sup> month.

## Results

The baseline results for the transitions from unemployment to employment (shown in Table A9) indicate that the 2012 reform increased significantly the probability of leaving unemployment and entering employment for any unemployment duration. The effect of the reform is significant as regards the probability for the unemployed of being hired on a permanent contract, which has increased by 24%, on average, during the first 6 months in unemployment where most transitions occur, although this probability remains very small in absolute terms. The effect of the reform on the probability to exit from unemployment into permanent employment is more sizeable for those being unemployed for less than 7 months than for those unemployed between 7 and 13 months or more than 13 months (Figure A5).

The reform seems to have increased as well the probability of leaving unemployment and entering temporary employment, although the effect is not significant in most specifications.<sup>81</sup> Thus, for unemployment durations no longer than 6 months, the reform appears to have raised the share of exits from unemployment to permanent employment in total exits from unemployment by about 14%, taking the point estimates at face value.

Results from transitions from unemployment to permanent employment also indicate a greater impact of the reform in small establishments than in larger ones (Table A4). The results from the estimation of the competing-risk hazard models suggest that the reform increased the average transition to a permanent contract – conditional on being unemployment for six months or less – by 26% in establishments with 50 or fewer employees, compared with 15% in establishments with over 50 employees (Figure A6). To the extent that the large majority of firms are mono-establishments, this points to a greater impact of the reform on hiring for smaller firms.

80. As for analyses based on the ECL, establishment here refer to the *Cuenta de Cotización*, which is unique for each firm at the province level.

81. However, in absolute terms, the estimated effect on transitions to permanent contracts is no smaller than that on transitions to temporary contracts. For example, taking point estimates at face value, in the first 6 months of unemployment, the average probability of a monthly transition to a temporary job increased from 18.6% to 19.9% due to the reform whereas the average transition to permanent employment increased only from 1.7% to 2.1%.

Table A9. The effect of the reform on Transitions out of Unemployment into temporary employment and into permanent employment

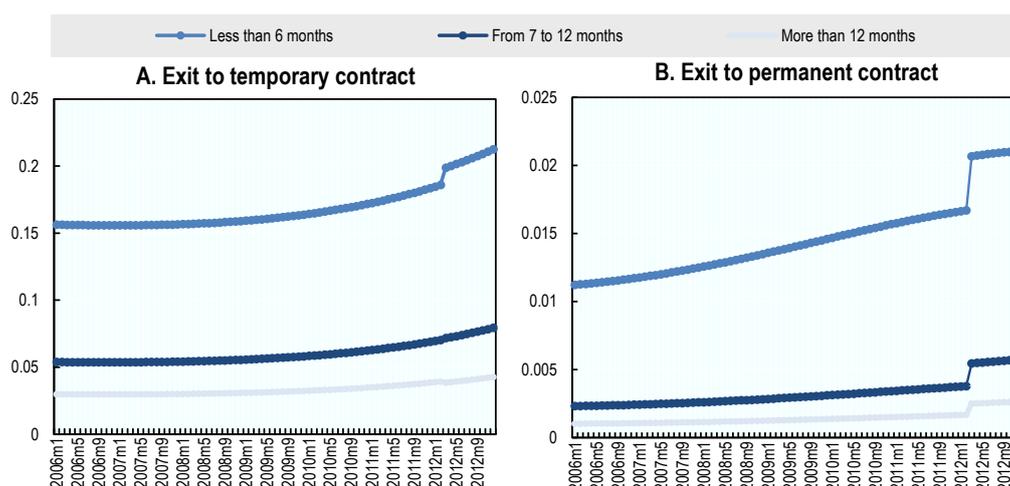
Monthly data, coefficients of the competing-risk hazard models

		Post-reform dummy	Placebo tests			Number of observations	Years
		(1)	One quarter before reform (2)	Two quarters before reform (3)	Three quarters before reform (4)		
<b>All sample</b>	<b>U to TC</b>	0.0999 (0.0641)	-0.120* (0.0654)	-0.177*** (0.0470)	-0.149*** (0.0442)	3,886,004	2003-2012
	<b>U to PC</b>	0.256*** (0.0746)	-0.0836 (0.0866)	-0.175** (0.0705)	-0.113* (0.0630)		
<b>Establishments with 50 employees or less</b>	<b>U to TC</b>	0.0967 (0.0669)	0.0994* (0.0541)	0.0377 (0.0576)	0.0254 (0.0470)	2,174,106	2006-2012
	<b>U to PC</b>	0.264*** (0.0796)	0.0381 (0.0789)	-0.0659 (0.0718)	-0.0264 (0.0674)		
<b>Establishments with more than 50 employees</b>	<b>U to TC</b>	0.0947* (0.0514)	0.0574 (0.0574)	0.0117 (0.0690)	-0.00221 (0.0473)		
	<b>U to PC</b>	0.165*** (0.0629)	-0.0401 (0.0965)	-0.0290 (0.114)	0.205*** (0.0662)		

Note: U: unemployment; PC: permanent employment; TC: temporary employment. Coefficients within border lines refer to simultaneous estimates. The All equations control for the unemployment duration (in logs) up to the 3rd order, the national unemployment rate, change in regional employment (and its interaction with the unemployment duration (in logs)), a 3rd order polynomial in time (months) in the models of the first two lines and a 5th order polynomial in the others, age and education categories, an indicator if the individual receives unemployment benefits (and the interaction of those variables with the duration of the unemployment spell), gender, migrant status, region, characteristics of the previous job (sector, type of contract, and if the individual was dismissed), the number of times the individual has been unemployed, the percentage of time he has been employed as well as monthly dummies. The sample includes all individuals who have been unemployed at least one day. Unemployment durations are censored at 30 months in unemployment. Robust standard errors, clustered on time in parentheses. \*\*\*, \*\*, \*: significant at the 1%, 5% and 10% level, respectively.

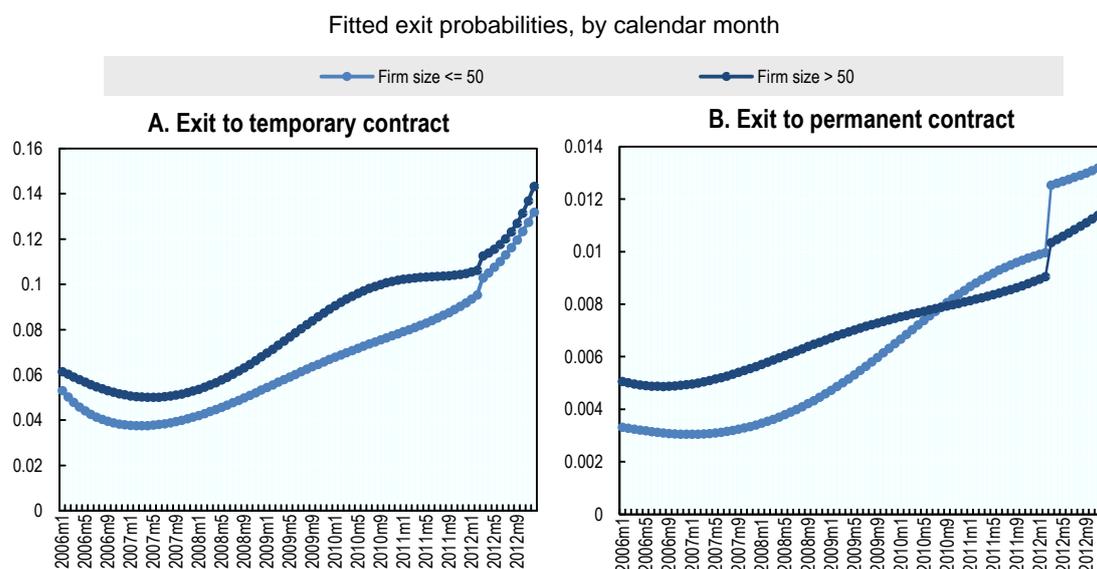
Figure A5. Exit from unemployment by type of contract and unemployment duration

Fitted exit probabilities, by calendar month



Note: The figure presents the average of estimated monthly probabilities of individual transitions from unemployment to employment by type of contract in the new job and unemployment duration (less than six months, from 7 to 12 months and more than 12 months), netting out the effect of the time trend and monthly dummies. The sample includes all individuals who have been unemployed at least one day. Unemployment durations are censored at 30 months in unemployment. Panel A refers to exits from unemployment to temporary contracts and Panel B to exits from unemployment to permanent contracts.

Figure A6. Exit from unemployment conditional on duration smaller or equal than 6 months, by type of contract and establishment size



Note: The figure presents the average of estimated monthly probabilities of individual transitions from unemployment to employment by type of contract in the new job and unemployment duration (less than six months, from 7 to 12 months and more than 12 months), netting out the effect of the time trend and monthly dummies. The sample includes all individuals who have been unemployed at least one day. Unemployment durations are censored at 30 months in unemployment. Panel A refers to exits from unemployment to temporary contracts and Panel B to exits from unemployment to permanent contracts.

Placebo tests are run for all the estimations by “anticipating” the date of the reform by up to three quarters. The coefficients are either non-significant or negative for all specifications, except for the placebo test three quarters before the reform for transitions to permanent employment in establishments with more than 50 employees. Similarly, some caution is required in interpreting baseline estimates since placebo test statistics are significant (albeit negative) when the placebo date is two quarters before the true reform. However, these statistics turn out to be insignificant when transition hazards are allowed differing across establishment types.

Several robustness checks have been performed as well, which include i) substituting the polynomial trend for calendar year dummies; ii) using polynomial time trends of different order; ii) performing the estimations separately by type of previous contract held, by age groups and by gender; iii) substituting regional unemployment rates for aggregate ones; and iv) replacing registered employment by the index of economic activity of FEDEA. Results presented in Table A9 are robust to these changes.

The effect of the 2012 reform has not been homogeneous on all individuals (Table A10). In particular, transitions from unemployment towards permanent employment have increased significantly more for those that had a temporary contract prior to becoming unemployed, while the effect remains insignificant for those who previously held a permanent contract. Symmetrically, the results suggest a marginally positive impact of the reform on the speed of transition towards a temporary contract only for those that had a permanent contract prior to becoming unemployed.

The reform seems also to have had a greater impact on younger workers, a population group severely affected by unemployment, than on older ones. Transition rates from unemployment towards permanent employment have increased more for individuals aged 18-30, compared to for those aged 31-44 and 45-64 (Table 6).

Finally, estimating the same models for transitions out of permanent or temporary contract yields an insignificant impact of the reform on these transition hazards.

Table A10. **The effect of the reform on Transitions out of Unemployment into temporary employment and into permanent employment, by personal characteristics**

Monthly data, coefficients of the competing-risk hazard models

	Post-reform dummy		Number of observations
	U to TC	U to PC	
	(1)	(2)	(3)
<b>Previous temporary</b>	0.0902 (0.0637)	0.639*** (0.0775)	3,047,292
<b>Previous permanent</b>	0.149* (0.0822)	0.153 (0.0993)	838,712
<b>Males</b>	0.104 (0.0682)	0.269*** (0.0663)	1,996,002
<b>Females</b>	0.0913 (0.0606)	0.246*** (0.0873)	1,890,002
<b>Age 18-30</b>	0.0703 (0.0542)	0.319*** (0.0544)	1,770,386
<b>Age 31-44</b>	0.0950 (0.0702)	0.247*** (0.0836)	1,370,296
<b>Age 45-64</b>	0.191* (0.109)	0.225* (0.124)	745,322

*Note:* U: unemployment; PC: permanent employment; TC: temporary employment. Coefficients on the same line refer to simultaneous estimates. All equations control for the unemployment duration (in logs) up to the 3rd order, the national unemployment rate, change in regional employment (and its interaction with the unemployment duration (in logs), a 3rd-order polynomial in time (months), age and education categories, an indicator if the individual receives unemployment benefits (and the interaction of those variables with the duration of the unemployment spell), gender, migrant status, region, characteristics of the previous job (sector, type of contract, and if the individual was dismissed), the number of times the individual has been unemployed, the percentage of time he has been employed as well as monthly dummies. The sample includes all individuals who have been unemployed at least one day. Unemployment durations are censored at 30 months in unemployment. Robust standard errors, clustered on time in parentheses. \*\*\*, \*\*, \*: significant at the 1%, 5% and 10% level, respectively.

November 2015

## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE: INITIAL CONSIDERATIONS FOR THE FUND

IMF staff regularly produces papers proposing new IMF policies, exploring options for reform, or reviewing existing IMF policies and operations. The following document(s) have been released and are included in this package:

- The **Staff Report** prepared by IMF staff and completed on October 13, 2015

The report prepared by IMF staff has benefited from comments and suggestions by Executive Directors following the informal session on October 28, 2015. Such informal sessions are used to brief Executive Directors on policy issues and to receive feedback from them in preparation for a formal consideration at a future date. No decisions are taken at these informal sessions. The views expressed in this paper are those of the IMF staff and do not necessarily represent the views of the IMF's Executive Board.

The documents listed below have been or will be separately released.

- Structural Reforms and Macroeconomic Performance: Country Cases.

The IMF's transparency policy allows for the deletion of market-sensitive information and premature disclosure of the authorities' policy intentions in published staff reports and other documents.

Electronic copies of IMF Policy Papers  
are available to the public from  
<http://www.imf.org/external/pp/ppindex.aspx>

**International Monetary Fund**  
**Washington, D.C.**



October 13, 2015

## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE: INITIAL CONSIDERATIONS FOR THE FUND

### EXECUTIVE SUMMARY

Structural policies have become a prominent feature of today's macroeconomic policy discussion. For many countries, lackluster economic growth and high unemployment cloud the outlook. With fewer traditional policy options, policymakers are increasingly focused on the complementary role of structural policies in promoting more durable job-rich growth. In particular, the G20 has emphasized the essential role of structural reforms in ensuring strong, sustainable and balanced growth.

Against this backdrop, the 2014 Triennial Surveillance Review (TSR) called for further work to enhance the Fund's ability to selectively provide more expert analysis and advice on structural issues, particularly where there is broad interest among member countries. The purpose of this paper is to engage the Board on staff's post-TSR work toward strengthening the Fund's capacity to analyze and, where relevant, offer policy advice on macro-relevant structural issues.

While there is already an extensive range of work underway across the Fund, this paper lays out considerations to help frame a more strategic approach on structural issues that would better support the range of macro-structural needs of member countries. In that regard, this paper does not signal a dramatic shift in the Fund's agenda or coverage of structural issues; nor does it aim to provide a "how to" guide for advising countries on specific structural reforms. Instead, it focuses on "what" structural reforms are most likely to have macroeconomic implications, without attempting to do justice to the entire spectrum of issues that come under the structural reform umbrella.

To this end, the paper deploys a number approaches to identify reform areas most relevant across the membership.

- The empirical analysis finds a broadly positive relationship between structural reforms and productivity—in short, structural reforms matter. Importantly, the potential payoff from different reforms varies across income groups. The results also suggest that the benefits of reform tend to become more pronounced when reforms are bundled together.
- Given the need for care in interpreting the empirical findings, the paper also explores lessons from six country cases. Their reform experiences tend to reinforce the empirical findings and resonate with historical reform patterns. Moreover, these experiences hint at potential lessons for effective reforms, including the importance of strong ownership, the ability to sustain reforms, and the need for complementary macroeconomic and structural policies.

## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE

- These findings, together with an initial assessment of country needs, point to differentiated structural reform priorities across different country groups, reflecting stages of development. Nevertheless, some common reform priorities emerge where there is likely to be more broad-based interest across the membership.

Looking ahead, the approach and priorities identified in this paper can help guide the Fund in supporting countries' macrostructural policy needs. At an institutional level, the Fund's operational efforts should be geared toward countries' shared priorities. The Fund should continue to focus on structural reforms within its traditional areas of expertise—namely, fiscal structural and financial sector reforms. There are however other common priorities, outside of the Fund's traditional areas of expertise yet within its mandate, and where there is likely to be broad-based demand across the membership. In such areas, the Fund may need to scale up its efforts to build in-house expertise. In areas where there is less likely to be widespread demand across the membership, the Fund should actively collaborate with and leverage other institutions' expertise.

The goal is to develop a richer analytical foundation and range of tools—from within and outside the Fund—that country teams can leverage in their analysis and advice. Four complementary tracks of future work can help move this agenda forward: more systematically assessing country needs; ongoing analytical work; developing an analytical toolkit for staff; and developing modalities for inter-agency collaboration. This is not to say that Fund's macrostructural analysis and advice in individual cases should be limited to those areas. Ultimately, Article IV consultations should always be country-specific.

Approved By  
Siddharth Tiwari

Prepared by Strategy, Policy, and Review Department, in consultation  
with area and functional departments.

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The country case studies—Armenia, Australia, Malaysia, Peru, Tanzania, and Turkey—were prepared in collaboration with area departments.

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## List of Abbreviations

AMs	Advanced Market economies
AML/CFT	Anti-Money Laundering/Combating the Financing of Terrorism
DSGE	Dynamic stochastic general equilibrium
EMs	Emerging Market economies
EMDCs	Emerging Market and Developing Countries
GPA	Global Policy Agenda
ILO	International Labor Organization
IMF	International Monetary Fund
LIDCs	Low-Income Developing Countries
NPLs	Non-Performing Loans
OECD	Organization for Economic Cooperation and Development
PRGT	Poverty Reduction and Growth Trust
QE	Quantitative Easing
R&D	Research and Development
REER	Real Effective Exchange Rate
REO	Regional Economic Outlook
TFP	Total Factor Productivity
TSR	Triennial Surveillance Review
ULC	Unit Labor Cost
UMP	Unconventional Monetary Policy
WEO	World Economic Outlook
ZLB	Zero Lower Bound

## INTRODUCTION

**1. Structural policies have become increasingly central to the policy debate on how to strengthen countries' macroeconomic performance.** Since the global financial crisis, much of the Fund's membership has been grappling with how to break the cycle of lackluster growth and high unemployment, albeit with increasingly limited policy options. Moreover, the crisis has taken a toll on productivity growth, compounding the productivity slowdown that for many countries began well before the crisis. To this end, the policy debate has focused increasingly on the role of structural policies in boosting potential growth and economic resilience to promote more durable growth. The G20 has recognized "the essential role of structural reforms in ensuring strong, sustainable and balanced growth."<sup>1</sup> The Fund has also called for efforts to accelerate structural reforms as "an essential complement to demand-boosting efforts."<sup>2</sup>

**2. Against this backdrop, the Fund needs a strategic and analytically sound approach to effectively support the range of macro-structural needs across all member countries.** The 2014 Triennial Surveillance Review (TSR) set out broad principles to guide when and how the Fund should engage on structural issues. It also called for further work to boost our understanding of structural issues, building expertise where there is broad-based interest among member countries and improving the modalities for leveraging the expertise of other agencies where possible. There is already an extensive range of work underway across the Fund to examine the macroeconomic implications of structural reforms and raise awareness of country experiences. Looking ahead, the goal is to build on these efforts to more consistently integrate macro-structural issues in the Fund's day-to-day operations.

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### **2014 TSR Recommendation:**

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*"Be selective in advising on structural policies. Recognize all macro-critical structural issues and their implications on an economy; follow principles to determine where to provide advice: macro-criticality, and Fund expertise or interest from 'critical mass' of the membership (e.g., financial deepening and labor market issues); in other areas, leverage advice from other international organizations."*

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**3. As a first step toward this broader agenda, this paper sets out considerations to help frame a more strategic approach.** The objective of this paper is not to signal a dramatic shift in the Fund's agenda or coverage of structural issues; nor does it aim to provide a "how to" guide for advising countries on specific structural reforms. Given the breadth and diversity of issues that come under the structural reform umbrella, one paper cannot do justice to the entire spectrum of issues. At this stage, the goal is to articulate more clearly, and give more analytical support to, the focus on particular structural reforms important for macroeconomic performance. In effect, this paper focuses on "what" structural reforms are, on average, most likely to have macroeconomic implications and thus be relevant for the Fund's dialogue with its members.

**4. Identifying the reform areas most relevant across the membership will help orient possible avenues of future work.** A central objective will be to provide a consistent and

<sup>1</sup> [G20 Communiqué](#), Meeting of G20 Finance Ministers and Central Bank Governors, 16-17 April 2015.

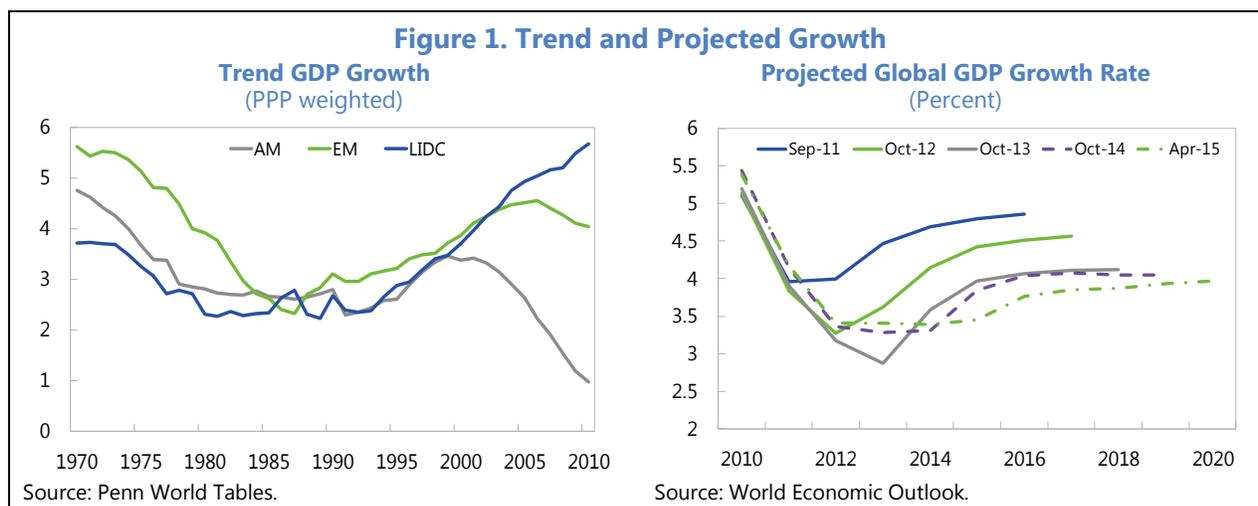
<sup>2</sup> [The Managing Director's Global Policy Agenda](#), Spring 2015.

evenhanded basis for engaging with member countries on structural issues—and, importantly, to avoid institutional overreach. Any approach should also be sufficiently flexible to ensure that the Fund’s policy analysis and advice reflects each country’s specific circumstances and needs. In this regard, the relationship between reforms and the macroeconomy are complex and varied, with a number of dimensions—covering direct and indirect implications for economic growth, stability, resilience and inclusion—that are potentially relevant for the Fund. Future work should therefore seek to understand more fully the needs of member countries, as well as delve more deeply into the macro-relevant effects of structural reforms and, where relevant, approaches to implementation.

**5. The paper is organized as follows:** Section II provides context on the evolving policy challenges for member countries and the increased attention to structural issues, including at the Fund; Section III presents stylized facts on the pattern of structural reforms over the past 30–40 years; Section IV assesses the relationship between structural reforms and productivity, including the relative benefits for different country groups as well as the implications of larger scale reforms and waves of contemporaneous reforms; Section V delves into the reform experiences of selected country experiences; Section VI explores considerations for the Fund’s operational approach to support the current reform priorities of member countries; Section VII discusses next steps in the Fund’s work on structural reforms; and Section VIII sets out possible issues for discussion.

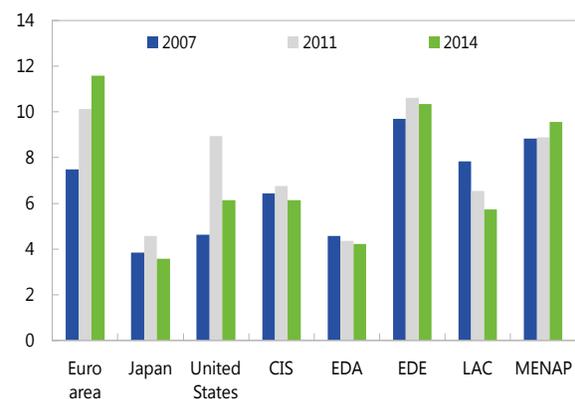
## THE POLICY CONTEXT

**6. Seven years after the onset of the crisis, a balanced, durable and job-rich recovery remains elusive.** Despite a rebound in global financial markets, global economic activity continues to disappoint. Since 2011, global growth has averaged around 3.5 percent, compared to an average of 4.2 percent between 1997 and 2006. The latest World Economic Outlook forecasts global GDP growth of around 3.1 percent this year, more than a percentage point lower than projected in September 2011 (Figure 1). At the same time, global unemployment remains stubbornly high at over 215 million people at end-2014, with particularly high rates in the Euro area, the Middle East and North Africa, and parts of Latin America (Figure 2).



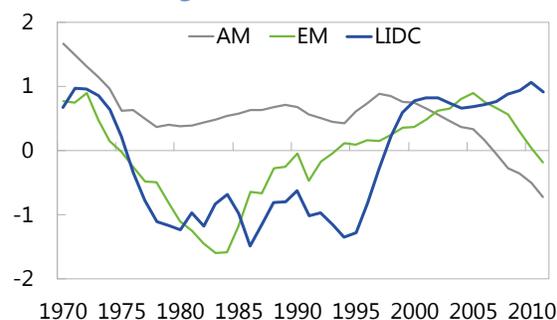
**7. Cyclical and structural factors are at play in this subdued global growth performance, although the slowdown in productivity growth has been a telling factor.** A sustained decline in potential output growth in advanced economies (AMs) began well before the crisis, driven largely by falling total factor productivity (TFP) growth and low employment growth (Figure 3). While the crisis further eroded TFP growth in the short-term, it also weighed heavily on investment and capital growth as well as potential employment growth, putting added downward pressure on potential growth among AMs. For emerging markets economies (EMs), lower TFP growth was also a key factor in the more recent decline in potential output growth, whereas potential employment and capital growth were largely unaffected by the crisis (Figure 4).<sup>3</sup> While potential output growth remains stronger in low-income developing countries (LIDCs), this tends to reflect factor accumulation rather than TFP growth. At the same time, for both EMs and LIDCs, the cyclical rebound from the crisis has also petered out. Domestic demand has

Figure 2. Unemployment Rate



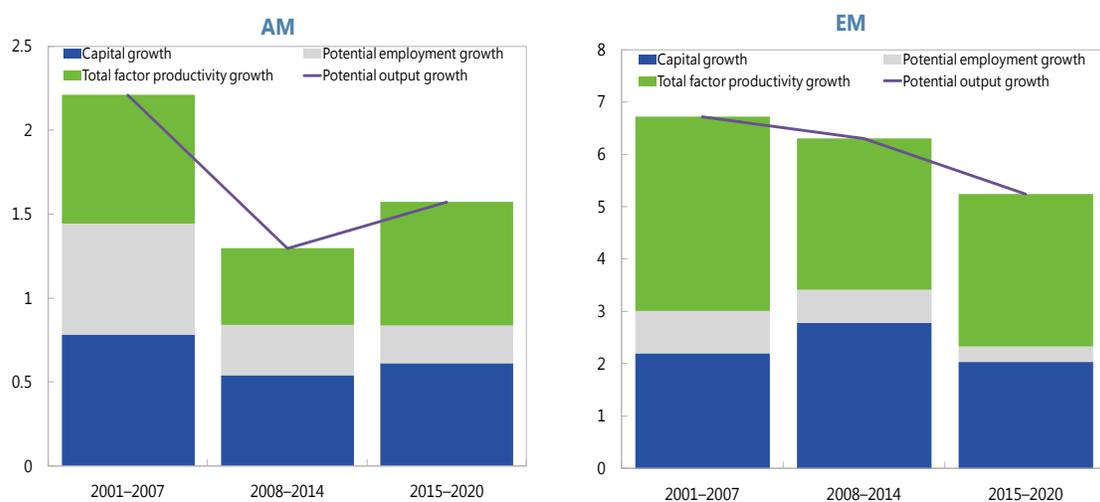
Source: World Economic Outlook, April 2015.

Figure 3. TFP Growth



Source: Penn World Tables.

Figure 4. Evolution of Potential Output Growth and its Components

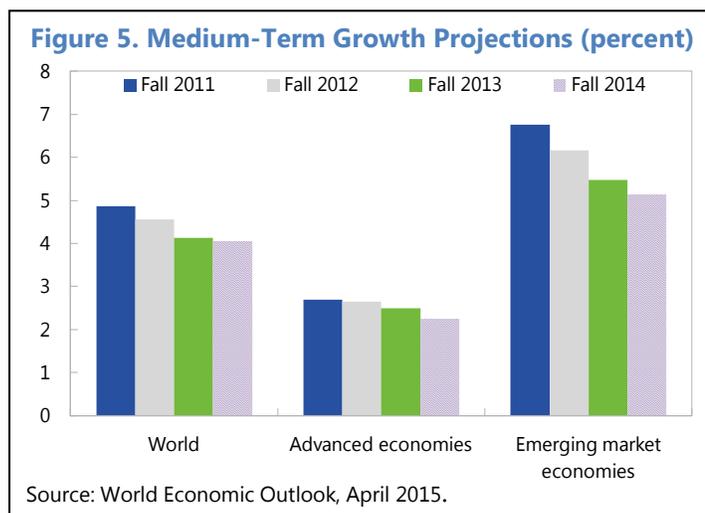


Source: World Economic Outlook, April 2015.

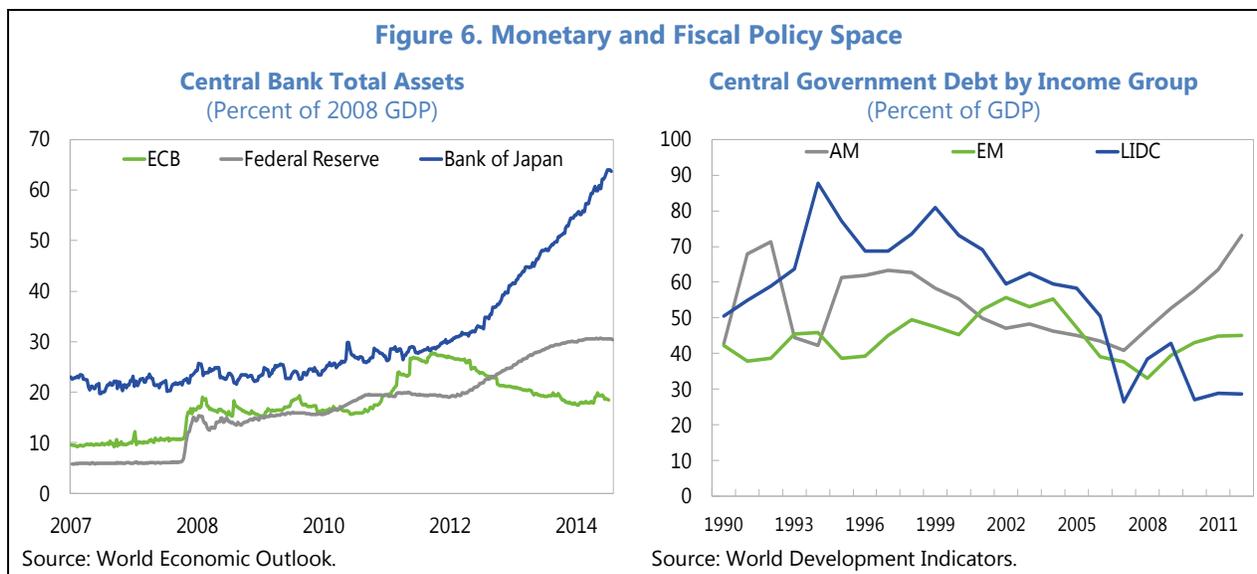
<sup>3</sup> World Economic Outlook, Chapter 3, *Where are we Headed? Perspectives on Potential Output*, April 2015.

normalized and the favorable external environment that facilitated income convergence over the past decade—high commodity prices, low interest rates and buoyant trade—has weakened.

**8. With TFP growth faltering in many countries, weak actual and potential growth continue to cloud the outlook.** Only a moderate global recovery is envisaged over the medium term (Figure 5). Repeated markdowns in growth forecasts—mainly among AMs and EMs, but also some LIDCs—demonstrate the uncertainty surrounding medium-term projections and the risk of a “new mediocre” if secular stagnation takes hold in AMs and/or potential output growth is much lower-than-expected in EMs and LIDCs. Although AMs could see some recovery in potential output growth on the back of a small rebound in TFP, it will likely remain below pre-crisis rates for some time, held back by unfavorable demographics and subdued investment. In EMs, potential output is expected to decline further, with lower TFP, capital, and employment growth. Although potential output growth may continue to rise in LIDCs, TFP growth is expected to remain persistently flat—especially at a time when raising potential growth is essential to generate the jobs needed for the growing working age population.



**9. In this context, policymakers should continue to support demand where feasible, recognizing that policy support faces increasing constraints in many countries** (Figure 6). For AMs, the initial rounds of fiscal stimulus, and aggressive and unconventional monetary policies (UMP) were vital to jumpstart the recovery and prevent a financial system meltdown. As monetary policy rates approached the zero lower bound (ZLB), subsequent waves of UMP sought to further support the economy with bond purchases (QE). While circumstances vary among countries, the potential limits on demand-side policy space are, however, now becoming increasingly visible for much of the membership. The average debt-to-GDP ratio for AMs remains above 100 percent and will likely decline only very slowly in a slow growth, low inflation environment. Monetary policy rates remain close to the ZLB, even breaking into negative territory in some countries. Although of a different nature, EMs and LIDCs also have to contend with more limited macroeconomic policy space—for many inflation is above target, monetary policy rates are already low (or below neutral) and fiscal positions have weakened as a result of policies to counter the fallout from the crisis.



**10. Another consideration is that structural rigidities and market imperfections can also weigh on the effectiveness of demand-side policies and the efficient allocation of resources.**

UMP, particularly QE, proved crucial to supporting aggregate demand. And there is still unexploited scope in some countries for further demand support that need to be considered. However, over time the liquidity injected by central banks increasingly remains deposited as excess reserves, and corporates sit on large cash stockpiles. Complementary reforms to improve transmission mechanisms,<sup>4</sup> will help accommodative monetary policies become more effective in raising real investment. In contrast, overreliance solely on UMP can boost asset prices and generate financial stability risks. It is also telling that the recent confluence of generally favorable conditions—lower oil prices and the major depreciation in exchange rates—have yet to deliver a decisive boost to the real economy.

**11. Consequently, there is increasing interest in the role of structural policies in securing more durable and job-rich growth.** With faltering potential growth, persistent economic slack and, in some cases, constraints on demand support (both policy space and efficacy), structural reforms can be a critical component of a broader policy response. On the supply side, improving the allocation of resources and increasing investment can raise TFP—a key driver of actual and potential output growth. On the demand side, credible structural reforms can signal medium-term policy commitment, helping to build confidence and stimulate investment in the short term. Over time, structural reforms can also help to improve economic resilience. Stronger medium-term growth can improve debt dynamics, reinforcing efforts to rebuild policy buffers. Also, addressing underlying structural rigidities and the misallocation of resources can improve how an economy dynamically responds to shocks and to demand-support policies.

<sup>4</sup> For instance, insolvency reforms that incentivize the resolution of non-performing loans (NPLs) can help remove impediments to new lending.

**12. The channels through which structural reforms impact the macroeconomy are, therefore, varied and complex, not all of which are sufficiently understood.** For instance, initial conditions can be crucial for the impact of reforms—in terms of both size and duration—but there is no unanimity of views on exactly how. Similarly, regardless of initial conditions, while it is intuitive that the impact of some reforms is likely to accrue in the short term, for many others the effects are likely to accrue only over the medium- to longer-run. This all remains to be demonstrated in a sufficiently robust analytical framework, and the aim of this paper is not to take on these issues (although it could be a stream of future work). Rather the immediate objective, in line with the recommendations of the TSR, is to address an operational imperative—identify those structural reform areas that warrant more focus for the Fund.

**13. A strategic approach can help guide this effort and, in time, better position the Fund to effectively engage across the wide range of countries' reform needs.** Given the potential breadth of issues, we should be cognizant of the need to prioritize, and the Fund should continue to strive to better understand those reforms likely to strengthen macroeconomic performance and build economic resilience. That is not to imply that the Fund would prescribe a particular set of policies or take an overly narrow interpretation of macroeconomic relevance. To the contrary, the goal is to invest in analytical and operational approaches that continue to build a deeper understanding of the range of channels and macro-relevant effects of reforms. Over time, this would boost the Fund's capacity to deliver high-quality country-specific analysis and, where appropriate, advice. The Fund's mandate and *Articles of Agreement* can help guide these efforts, in line with its institutional responsibility (Box 1). At the same time, many structural issues will likely remain outside the Fund's areas of expertise, and exploiting opportunities for more effective collaboration with other agencies will be crucial to providing member countries with expert analysis in those areas.

**14. The Fund has already stepped up its efforts to better appreciate the macroeconomic implications of structural reforms.** This paper follows an extensive—and growing—analytical agenda both inside and outside the Fund (Boxes 2 and 3, respectively). A core element of the Fund's analytical work has focused on cross-cutting issues and assessing the impact of structural reforms on economic outcomes (such as, growth, productivity, employment, inequality). Other streams of work have targeted analyzing particular policy challenges or different types of reform (e.g., energy subsidy reform, labor market policies, fiscal structural reforms, infrastructure investment, insolvency reform, or financial deepening), and often as they relate to economic challenges faced by individual countries, groups of countries or regions. In this regard, bilateral and multilateral surveillance are playing an instrumental role in deepening the Fund's understanding of the relationship between structural reforms and macroeconomic performance. This, in turn, provides a stronger basis to leverage cross-country knowledge of policy experiences, while ensuring Fund analysis and policy advice is tailored to country circumstances.

### Box 1. Basis for Fund Engagement on Structural Issues<sup>1/</sup>

**The primary goal of the IMF is to promote global economic and financial stability.** Article I of the *Articles of Agreement* sets out the purposes of the Fund and its role in supporting the rules and mechanisms for stability of the international monetary system; as well as facilitating the expansion and balanced growth of trade, and thereby contributing to the goal of member countries to promote and maintain high levels of employment and income.

**Surveillance—with its core organizing principle of stability—is central to achieving this objective.**<sup>2/</sup> To this end, multilateral surveillance pertains to global or regional economic and financial stability, and can encompass a wide range of country policies to the extent that they have wider spillovers. Bilateral surveillance focuses on an *individual* country's domestic and balance of payments stability and, as such, it always assesses exchange rate, monetary, fiscal and financial sector policies. However, it should also be tailored to reflect country circumstances and thus can cover other policies that have implications for stability. While growth is not strictly a goal of bilateral surveillance, in practice it often falls within its scope given the extent to which it can affect stability.<sup>3/</sup>

**There are several channels through which structural issues could have a bearing on stability.** For instance:

- *Impeding the efficient allocation of resources within an economy could contribute to the buildup of imbalances.* For example, impediments to competition and protection of the non-tradable sector can inhibit the development of the tradable sector and lead to an unsustainable external position.
- *Limiting flexibility could prevent timely adjustment to shocks and weaken the resilience of an economy.* For example, labor market rigidities (especially with regard to wage setting, unemployment benefits, severance pay) can contribute to high unemployment and low productivity growth. Similarly, impaired private sector balance sheets (with NPLs and debt overhang) can hold back lending and investment, constraining the pass-through of easier financial conditions.
- *Constraining potential, and eventually actual, growth can undermine stability.* For example, investment bottlenecks that constrain productivity and output growth can contribute to unfavorable debt trajectories, deteriorating financing conditions, and financial sector instability.
- *Generating imbalances in a member country or group of countries that impact global economic and financial stability.* For example, weak investment in AMs, infrastructure bottlenecks in EMDCs and deficiencies in LIDCs, can collectively weigh on short-term global demand and medium-term global growth prospects.

**Assessing the implications of structural issues for stability requires judgment, taking into account country circumstances.** The [Guidance Note for Surveillance under Article IV Consultations](#) outlines different approaches to inform these assessments, including: analysis to identify key growth bottlenecks and their macroeconomic impact; or assessing how far an economy stands from its efficient frontier to pinpoint areas with the greatest growth impact. The Guidance Note also offers approaches to assessing outward spillovers for systemic economies.

**Structural reforms can also often be relevant in the context of Fund-supported programs.** Given that Fund financing is focused on addressing balance of payments needs, program conditionality covering structural issues is expected to be limited to the minimum necessary to address those issues that are of critical importance to achieving the program's goals or for monitoring program implementation. Coverage is therefore tailored to country circumstances, reflecting understandings between the Fund and country authorities.<sup>4/</sup>

**The Fund's capacity building activities can also involve structural issues and policies.** While this typically involves technical assistance in established areas of Fund expertise (e.g., fiscal structural reforms), it continues to evolve. For instance, since 2000 the Fund has also offered technical advice to improve countries' Anti-Money Laundering and Combating the Financing of Terrorism (AML/CFT) regimes.

<sup>1/</sup> Prepared in consultation with LEG.

<sup>2/</sup> Article IV (Section 3) provides for the Fund's oversight of: (i) each member's compliance with its surveillance obligations under Article IV, Section 1 (*bilateral surveillance*); and (ii) the international monetary system to ensure its effective operation (*multilateral surveillance*).

<sup>3/</sup> Policy advice provided in the context of surveillance can also cover other issues and policies, if they are important objectives for the member or if specifically requested by the member.

<sup>4/</sup> See [2011 Review of Conditionality](#).

## Box 2. Overview of the Fund's Recent Analytical Work on Structural Issues<sup>1/</sup>

Following the global financial crisis, the Fund has produced a tremendous volume of analytical work on structural issues. This work encompasses a wide variety of issues, ranging from cross-cutting reforms relevant to the broader membership to reforms specific to particular regions, country groups or levels of development.

A key goal has been to deepen the Fund's understanding of how structural reforms affect economic outcomes, including: (i) boosting incomes and economic efficiency (e.g., investment, labor/product market reforms); (ii) promoting fairness and equity (e.g., tax and subsidy reform, social spending, gender equality); (iii) fostering economic and financial stability (e.g., export diversification, financial supervision, insolvency regimes, management of capital flows); and (iv) improving quality of life (e.g., education, healthcare, climate issues).

The Fund has engaged in broad cross-cutting work examining how structural reforms affect economic growth and productivity as well as poverty, inequality, and environmental issues.

- **Economic growth and productivity.** The Fund has examined how [real and financial sector reforms](#) impact economic performance in advanced and developing countries, and how structural reforms impact [productivity growth](#) in aggregate and by sector according to a country's development.
- **Inclusive Growth and Gender.** The IMF has focused increasingly on aspects of [inclusive growth](#), including different regional considerations. The Fund also conducts an annual survey on [access to finance](#) and has studied the role of [financial inclusion](#) in promoting more inclusive growth. Fund staff has also looked at the macroeconomic gains from [closing gender gaps](#) in labor markets, including through addressing constraints on [female labor participation](#), as well as drawing lessons from country experiences (such as in India, Hungary, Japan, the Nordic region, South Korea, and Saudi Arabia).
- **Climate.** In this area, the Fund's work focuses on the fiscal, financial, and macroeconomic impact of climate issues (e.g., via work on [water management](#), and [carbon taxes and fiscal policies](#) to mitigate climate change).

The Fund has also examined how structural reforms in particular sectors can boost output and efficiency.

- **Labor and product markets.** The Fund has analyzed the relationship of jobs and growth, emphasizing the need to tackle high unemployment. This analysis is often tailored to particular regions, such as reforms to help reorient employment from the public to private sector in [Gulf Cooperation Council countries](#) or monetary, debt and labor market reforms to help [create jobs in Europe](#). Structural issues have also featured prominently in [surveillance in Europe](#), including exploring the governance aspects of [structural reforms](#) and [fiscal structures](#) in the Euro Area.
- **Public investment and infrastructure.** In this area, staff analysis has found that [increased public infrastructure investment](#) raises output in both the short and the long-term, particularly when there is economic slack and the efficiency of investment is high. [Other work](#) shows that, given the potential for waste and inefficiency, better management of investment could close up to two-thirds of the efficiency gap.
- **Fiscal structural reforms.** The Fund has explored how fiscal reforms can support [strong and equitable growth](#), including how policies (such as stabilization, tax and expenditure policies, and institutional reforms) can boost labor supply, investment in physical and human capital, or productivity. Other analysis has covered reforms related to [fiscal frameworks](#), [tax administration](#), [public financial management](#) and [pension systems](#).
- **Managing natural resources and subsidy reform.** The Fund has examined economic policies to [manage natural resources](#), including [in collaboration with aid agencies](#). The IMF has also prepared comprehensive estimates of the fiscal, environmental, and welfare costs of [energy subsidy reform](#).
- **Trade.** Looking beyond trade liberalization, the Fund has sought to identify structural aspects that can promote growth and stability. This includes studying how economies in [emerging Europe](#) and [Asia](#) can take advantage of global value chains, and how [export diversification](#) can raise growth in low-income countries.

<sup>1/</sup>See Annex I for an illustrative list of recent Fund analytical work.

### Box 3. The Wider Literature on Structural Reforms—What Have We Learned So Far?<sup>1/</sup>

This box presents a snapshot of the vast and growing literature on the macroeconomic effects of reform.

Academic interest in reforms and their role in macroeconomic performance picked up during the 1990s as many countries embarked on broad economic reform programs, often triggered by deteriorating economic conditions (Drazen and Easterly, 2001), including external debt crises and recessions (Agnello et al., 2015). However, there is no fixed relationship between the drivers of structural reforms and their actual implementation. Each country's experience reflects its institutional characteristics, history and political systems (Haggard and Webb, 1993). Moreover, the packaging and pace of economic reforms often reflects not just technocratic considerations, but the process of building broad political support and the outcome of bargaining among interest groups.

Over time, the literature evolved from its focus on cross-country long-run growth analyses to more micro-level studies that better address causality. More recently, DSGE models are gaining popularity due to their capacity to quantify more complex effects related to reform interactions and dynamics. Empirical evidence from the literature generally supports that structural reforms enhance economic performance, although the estimated effects and channels vary depending on the type of reform and country-specific conditions.

Turning to individual areas, a large body of work finds that *financial sector reforms* have positive effects through more efficient allocation of resources (MacKinnon, 1973; Shaw, 1973; King and Levine, 1993; Galindo et al., 2005) and easier access to external financing (Rajan and Zingales, 1998). Some have argued that *stock market liberalization* leads to higher investment and output growth (Henry, 2000; Bekaert et al., 2005), whereas findings on the effect of *capital account liberalization* more broadly are less clear-cut (Eichengreen, 2002) and could depend on the income level of a country (Klein and Olivei, 2008). Early literature on *trade liberalization* yield mixed results (Rodríguez and Rodrik, 2000), but recent studies provide more support to the positive effects (Dollar and Kraay, 2004; Wacziarg and Welch, 2008; Estevadeordal and Taylor, 2013). The quality of *legal system*, and in particular *property rights*, is also found to have an important effect on long-run output and investment growth (Acemoglu and Johnson, 2005).

An emerging strand of research focuses on the link between growth and market regulation. A large number of studies using rich micro-level datasets find robust evidence that competition-promoting *product market reforms* help boost an economy's total factor productivity growth (Nicoletti and Scarpetta, 2003; Faini et al., 2006; Buccirossi et al., 2009; Bourles et al., 2013). The benefits of *labor market deregulation*, on the other hand, appear more mixed (OECD, 2007) and smaller than from product market reforms (Bouis and Duval, 2011). Nonetheless, some recent studies find that strict employment protection depresses productivity growth (Bassanini et al., 2009), and high unemployment benefits and tax wedges can negatively affect employment (Bassanini and Duval, 2009).

The issue of reform complementarities—arising from “packaging” multiple reforms—is a small but fast-growing area of research. Several studies find that the strength of legal and political institutions affect long-run growth through their influence on financial sector development (La Porta et al., 1997; Demirguc-Kunt and Maksimovic, 1998; Acemoglu and Johnson, 2005; Djankov et al., 2005; Beck et al., 2005; Prati et al., 2013; Christiansen et al., 2013). Other work examines potential interactions between product market distortions and labor market rigidities (Blanchard and Giavazzi, 2003; Jean and Nicoletti, 2003), providing some indication that product and labor market reforms could complement each other and thus have far-reaching effects beyond their respective markets. Based on results from a DSGE model, Cacciatore et al. (2012) suggest implementing a broad package of labor and product market reforms to minimize short-term transitional costs associated with certain types of reforms (e.g., job protection reform).

Finally, studies on the sequencing of reforms remain at an early stage, with further work needed to draw useful policy insights. Hauner et al. (2013) show that trade reforms tend to precede domestic financial reforms, rather than *vice versa*, confirming Rajan and Zingales' (2003) prediction that opposition to financial sector reform weakens when an economy allows greater trade flows. Bouis et al. (2012) find that reforms may have varying impact over the business cycle, suggesting that undertaking some reforms (e.g., labor market) in good times, rather than in bad times, may help limit short-term implementation costs.

<sup>1/</sup> See Annex V for a full list of references.

## STRUCTURAL REFORM PATTERNS & STYLIZED FACTS

*Understanding how structural reform efforts have evolved across countries and over time can provide a useful starting point for better appreciating the macroeconomic benefits and considering possible operational implications for the Fund. Although structural reforms are more difficult to measure than typical macroeconomic policies, efforts to develop indicators make it possible to observe longer-term reform patterns across the membership and among country groups. Trends over the past several decades suggest that reform efforts have often borne a close relationship with macroeconomic conditions, stages of development and global integration.*

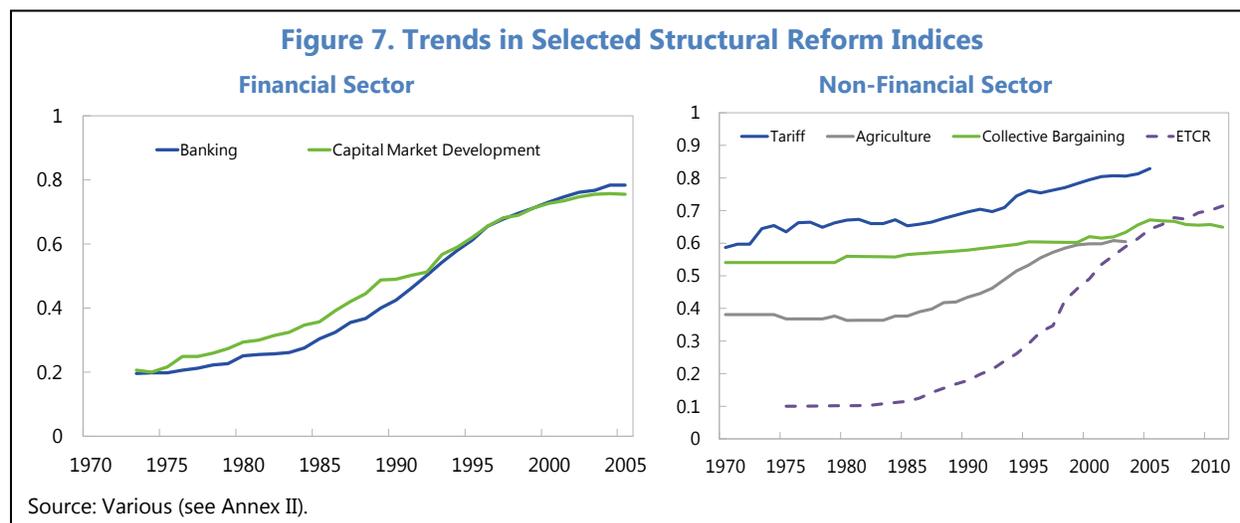
**15. Structural reforms are inherently difficult to measure as they often involve policies or issues that are not easy to quantify.** They typically concern policies geared towards raising productivity by improving the technical efficiency of markets and institutional structures, and by reducing or removing impediments to the efficient allocation of resources. Thus, structural reforms have typically been associated with regulatory policies aimed at strengthening market-based incentives in domestic product and service markets, labor markets, trade, and capital and financial markets among others. However, structural reforms may also involve actions to address market failures (such as the increased emphasis on effective financial sector regulation since the crisis) or other government policies that can affect productivity more directly. In this regard, the recent Board paper on *Fiscal Policy and Long-term Growth* noted that fiscal policy can play a role, including where private provision may be less efficient in allocating resources (e.g., infrastructure) or where private markets do not adequately capture positive externalities (e.g., research and development).

**16. The priority for this paper has been to examine reform patterns and relationships based on reform indicators that are broadly representative of the entire Fund membership.** The database covers 108 countries—33 AMs, 53 EMs, and 22 LIDCs—during the period 1970–2011 (see Annex II). It covers structural reforms in 10 areas, ranging from trade and financial sector reforms to institutional reforms, as well as reforms relating to the functioning and regulation of markets. Comparable indicators of fiscal structural reforms, beyond those noted above, are currently not available.<sup>5</sup> However, the emphasis here is to apply a consistent analytical approach to a sufficiently large sample, covering all income groups.

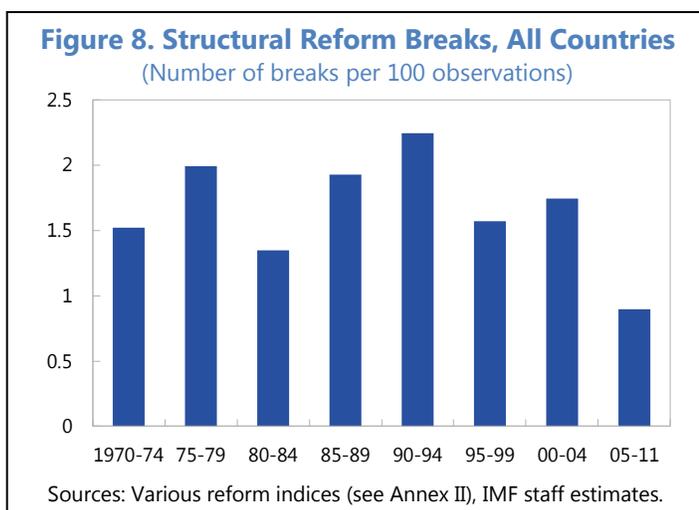
**17. These indicators suggest that the Fund’s member countries, at all levels, have undertaken substantial structural reforms over the past 30–40 years** (Figure 7). With few exceptions, most reform indices have trended up since the 1970s. The most pronounced and sustained advances have taken place in banking and other financial sector reforms, although there are also clear positive reform trends in agriculture, trade and industry. Performance in other areas is more mixed, with limited progress in infrastructure, and more sporadic efforts in legal system and

<sup>5</sup> The Board paper on [Fiscal Policy and Long-term Growth](#) examined extensively fiscal reforms using an alternative framework and we draw on the findings of that analysis in later aspects of this paper.

labor market reforms. However, a deeper look at the pace of reforms across different indices or country groups provides a richer picture.



**18. The strongest reform momentum tended to coincide with periods of economic stress or turbulence.** We identify big reform episodes based on the largest annual improvements in reform indices (top 3 percent) sustained during a three-year window (Figure 8). The *first big reform push* took place in mid-1970s, with a surge in reform efforts in the period following the breakdown of the Bretton Woods system and the first oil price shock. A *second big push* occurred during the late 1980s and early 1990s on the heels of the Latin American debt crisis and when many countries moved into recession after the 1987 stock market crash. Reform efforts gathered steam again during a *third big push* in the late 1990s and early 2000s around the time a number of EMs experienced financial crises. This pattern appears to be broadly consistent with literature that suggests that sustained or acute economic weaknesses often catalyze concerted structural reform efforts (see Box 3).

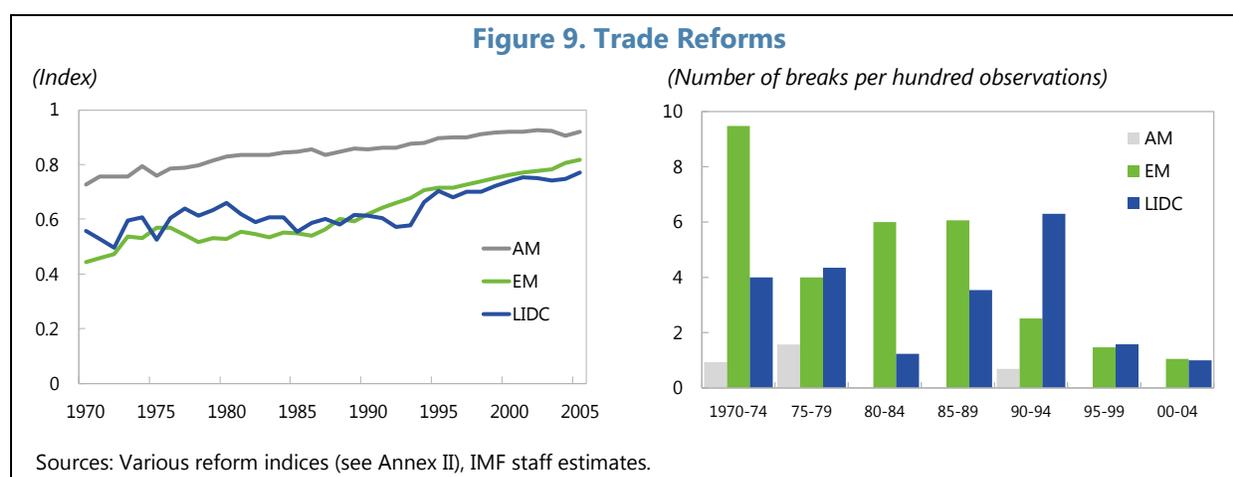


**19. Reform patterns in several areas also tend to mirror the acceleration in global economic and financial integration.** In particular, *trade reforms* initially appear to have been undertaken in the context of multilateral and regional trade negotiations (Figure 9). EMs were perhaps most aggressive in pursuing trade reforms in the 1970s and 1980s, as many gradually phased out import substitution policies and pursued export-led growth models. Trade reform got a further boost from LIDCs from the second half of the 1980s to the mid-1990s. However, the

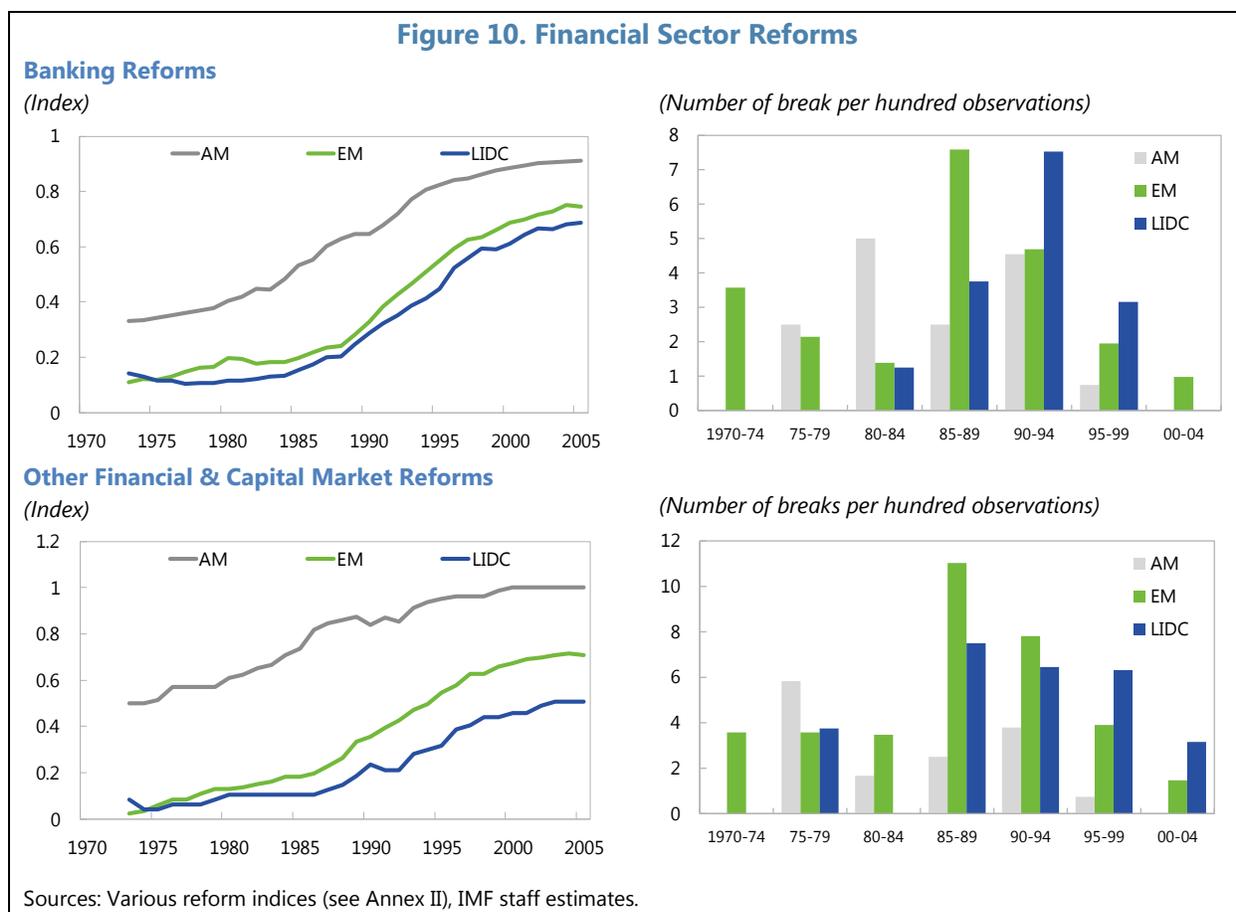
increased potential for international competition or spillovers from, and the desire to take advantage of, a globalized economy have created incentives to pursue broad-based reforms beyond basic trade liberalization.<sup>6</sup> In this regard, the staggered take-off of *banking* and *capital market reforms* also appears broadly consistent with the pattern of international financial integration—first picking up among AMs in the 1970s, then by EMs a decade later, and in turn LIDCs with the gradual development of their domestic financial sectors (Figure 10).

## 20. However, certain reform patterns seem more attuned to evolving circumstances faced by countries—in particular, their stage of development.

- Early reforms by EMs and LIDCs focused on building stronger institutional foundations—*legal system and property rights* and *infrastructure*—although efforts have waned in some areas. AMs have not made progress on infrastructure since the 1970s, possibly reflecting large scale investment in earlier period and, thus, the recent increased attention to infrastructure (e.g., G20).
- In the wake of falling agricultural prices, and also possibly reflecting increased trade integration, *agricultural reforms* accelerated in EMs and particularly LIDCs from the mid-1980s through the 1990s.
- The global trend towards increased transparency and accountability may well have increased the emphasis on *business environment reforms* by AMs in the 1990s and more recently by EMs. Reforms by EMs in this area also reflected their broad structural transformation. These reforms were followed by more sophisticated *labor market reforms* in the 2000s, with efforts focused on decentralizing collective bargaining and reforming hiring and firing regulations.
- *Industry reforms* by AMs and EMs picked up in the second half of the 1990s, an era of rapid technological innovation (e.g., telecommunications) and the search for new energy sources.



<sup>6</sup> For example, see Sachs and Warner (1995).



## ASSESSING THE IMPACT OF STRUCTURAL REFORMS

Observing broad reform patterns, however, can only take us so far. If the Fund is to invest more systematically in supporting countries' reform needs, this requires a deeper and more robust appreciation of the relationship between reforms and macroeconomic performance. In this instance, we focus on productivity, finding a broadly positive relationship with structural reforms—one that tends to become more pronounced when reforms are bundled together. However, going forward, the Fund should continue to explore a range of channels and effects to paint a more comprehensive picture of the relationship between reforms and macroeconomic performance.

**21. While structural reforms can be expected to affect macroeconomic performance through a variety of channels, productivity warrants attention at this juncture.** In particular, TFP is a significant driver of output (Figure 11).<sup>7</sup> Given the secular decline in productivity, worsened by the crisis, raising productivity is an essential piece of today's policy puzzle—both in boosting potential growth and economic resilience. Moreover, the impact of reforms on employment and capital accumulation are worthy of attention in their own right, and have been covered in more

<sup>7</sup> By decomposing levels of GDP per capita, Hall and Jones (1999) and Duval and de la Maisonneuve (2010) found that differences in productivity are a key determinant of cross-country variations in output per capita.

detail in other Fund analysis (Annex I), but for the purposes of this paper, they are implicitly captured when we consider growth in testing the robustness of our findings on productivity. While the remainder of this paper focuses on productivity, it will be essential for the Fund to continue exploring the impact of structural reforms on other macroeconomic variables. There is particular merit in looking at other effects as they pertain to specific reforms or are of special relevance to a region or group of countries (e.g., labor market reforms and employment).

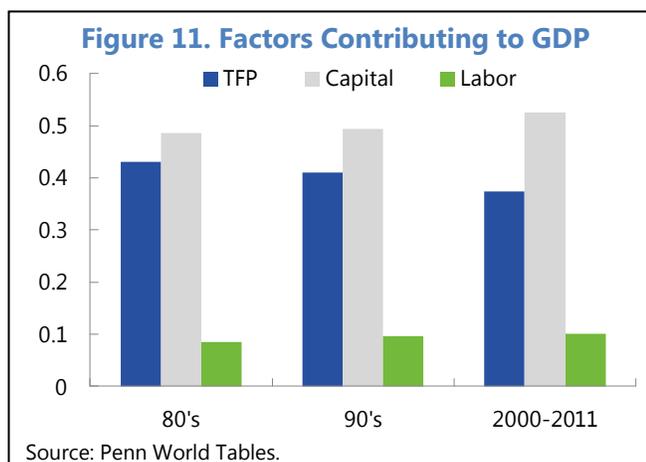
**22. Several different empirical approaches yield broadly similar conclusions regarding the relationship between structural reforms and productivity.**<sup>8</sup> Building on previous Fund

work, the analysis first explores the relationship between broad *reform trends* and productivity for all country income groups, including whether the impact varies across reforms and different country groups. Second, it considers if and how large-scale individual reforms (episodes) affect the results. Finally, it assesses the impact of *implementing several reforms in parallel* (waves) and whether the results differ from individual reform episodes.

### A. Steady Reform Trends

**23. The results from our first exercise point to a broadly positive relationship between different types of reforms and productivity growth.** Using panel regression analysis, we estimate the impact of different types of structural reforms one year forward on TFP growth for countries at different stages of development. The results (Table 1) are broadly aligned with the historical reform patterns (previous section), as well as a range of previous Fund work.<sup>9</sup> They are also consistent with an intuitive understanding of the relationship between reforms and stages of economic development.

**24. In this regard, we find that the potential payoff from different reforms varies across country groups.** For instance, reforms to the legal system and property rights show a positive association with productivity growth in LIDCs and EMs, but not in AMs. In contrast, labor reforms (such as those concerning conditions related to hiring and firing and collective bargaining) are



<sup>8</sup> The structural variables used in this analysis are presented in Annex II and are the same as those for which stylized facts are presented in the previous section. The various empirical approaches are described in Annex III.

<sup>9</sup> See, for example, [The New Normal: A Sector-Level Perspective on Productivity Trends in Advanced Economies](#); Dabla-Norris, et al. (2015); [Anchoring Growth: The Importance of Productivity-Enhancing Reforms in Emerging Market and Developing Economies](#), Dabla-Norris, et al. (2013); [Structural Reforms and Economic Performance in Advanced and Developing Countries](#), IMF Occasional Paper No. 268 (2008); and "Which Reforms Work and under What Institutional Environment? Evidence from a New Data Set on Structural Reforms," *Review of Economics and Statistics*, Vol. 95:3 (July), pp. 946-968, Prati et. al., 2013.

## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE

associated with higher productivity growth in EMs and AMs, but not in LIDCs. In this regard, the varying magnitudes and significance of coefficients highlight differences in the potency of structural reforms across country groups.

**25. Applying the same approach to other key macro-indicators also suggests a positive relationship with the same set of reforms.** Cognizant of the broader notion of macroeconomic performance, we undertook a battery of checks and balances, testing different specifications and variables.<sup>10</sup>

- This included, for instance, examining the strength of the productivity-reform relationship with longer lags, as well as looking at the relationship between reforms and output and investment growth. The positive relationship holds up under these checks—in particular, substituting GDP growth for TFP growth generates similar results—providing reassurance of a robust relationship with productivity and the macroeconomic relevance of reform more broadly.
- In a similar vein and in keeping with the Fund’s focus on stability, a separate track of ongoing work exploring the relationship between reforms and external resilience is generating early favorable results (see Box 4).

**Table 1. TFP Growth Gains from Different Types of Structural Reforms between Country Groups**

REFORMS	AM	EM	LIDC
<b>Financial Sector Reform</b>			
Banking system reform	Light	Medium	Dark
Interest controls			Dark
Credit controls	Light	Medium	Dark
Privatization		Medium	Dark
Supervision	Light	Medium	Dark
Capital market development	Light	Medium	Dark
<b>Trade Liberalization</b>			
Tariff rates (average)			Dark
<b>Institutional Reform</b>			
Legal system and property rights		Medium	Dark
<b>Infrastructure</b>			
Public capital stock	Medium	Light	Dark
<b>Market Deregulation</b>			
Agriculture			Dark
Policy environment for foreign investment	Dark		
Promotion of competition		Dark	
Hiring and firing regulations	Medium	Dark	
Collective bargaining	Medium	Dark	
Energy/Transport/Communications	Dark		
<b>Innovation</b>			
R&D spending	Dark		

Note: Comparisons across country groups. Shading implies magnitude, with the darkest shade representing the strongest gain from reform and the lightest shade representing a minor gain.

Source: IMF staff estimates.

<sup>10</sup> The alternative specifications included using longer lags of reform indices. The entire set of robustness checks are described in Annex III.

- An additional check to assess the long-run impact of reform on productivity suggests that reform priorities within each group (LIDCs, EMs, AMs) are broadly similar with our baseline results. There are a few exceptions. Over the long-run, the loosening of hiring and firing regulations has a less pronounced impact for AMs and EMs. On the other hand, several reforms have a stronger long-term impact: infrastructure (all country groups), bank supervision (EMs), capital market development (LIDCs), and decentralizing the collective bargaining process (EMs).

#### Box 4. Structural Reforms and External Resilience<sup>1/</sup>

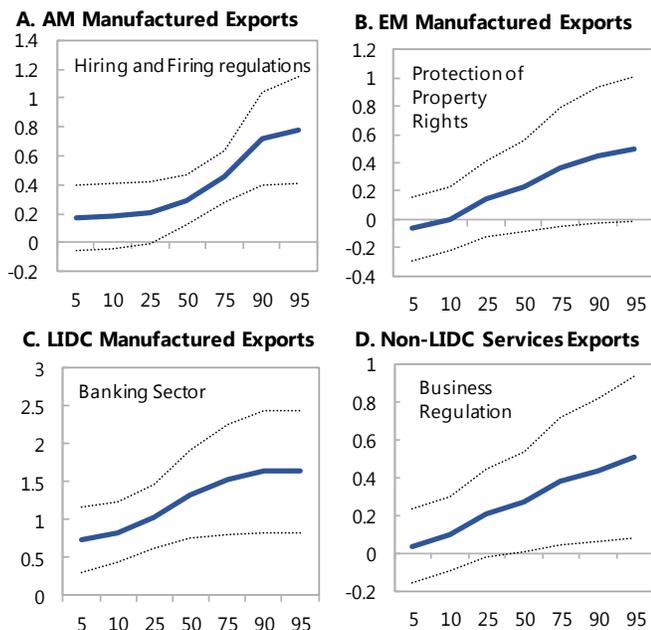
**Structural reforms can help countries adjust to shocks, thus contributing to economic stability.** There are numerous channels through which structural reforms can speed up the response to economic signals, thus improving resilience. We focus on the resilience to shocks propagated through the real exchange rate. More resilient economies should exhibit a higher export response to real depreciations. *Labor and product market reforms* remove impediments to the allocation of resources to the tradeable sector. A *sound financial sector* facilitates this reallocation by channeling resources needed to finance the adjustment. Strong *legal systems* can mitigate risks associated with the transition, which would otherwise lead to underinvestment. *Trade openness* ensures that missing inputs are readily available.

**We analyze the impact of structural indicators on the exports' response to REER movements** using cross-country panel regressions that allow for estimating the percentage change in exports in response to a one percent change in the REER.<sup>2/</sup> This

slope—called the *elasticity of exports with respect to the REER*—denotes the sensitivity of exports to movements in the exchange rate, with a steeper slope indicating a higher sensitivity. The hypothesis is that the slope (elasticity) should increase as structural indicators improve, i.e. countries with better structural indicators should respond more to a given REER depreciation. Since different structural indicators are likely to be binding at different income levels (e.g., reflecting differences in economic structures), we also expect different types of indicators to matter across income groups.

**The measured elasticity increases as structural indicators improve.** The text figure shows how elasticities change across the distribution of select structural indicators across countries. For example, panel A shows that an AM moving from the 25<sup>th</sup> to the 75<sup>th</sup> percentile of the distribution in terms of hiring and firing regulations will see its export elasticity for manufacturing goods increase from 0.2 to 0.45, i.e. its exports will have twice as large a response to a given REER depreciation.

#### Export Elasticities Across Structural Indicators



Note: Horizontal axis is percentile distribution of countries in respective income group across the structural indicator. The dotted lines indicate the 95 percent confidence interval.

### Box 4. Structural Reforms and External Resilience (cont.)

**The specific reforms that matter differ across income groups.** The text table summarizes the magnitude and statistical significance of the impact of various structural indicators on export elasticities across income groups.<sup>3/</sup> Key findings, in the case of manufactured exports, are as follows:

- *In advanced economies*, product and labor market regulations are the primary facilitators of the manufactured exports' response to REER movements.
- Institutional indicators are important in *emerging markets*, which is consistent with the prominent role played by cross-border supply chains, which heavily rely on a strong contracting environment.
- *In low income countries*, banking sector regulations have a strong effect on export elasticities.<sup>4/</sup>

The table also presents results for *services exports* using Balance of Payments data for AMs and EMs. We find that services exhibit strong responses to REER movements in the presence of flexible financial sectors, trade openness, strong legal systems and property rights.

It should be noted that caveats regarding the main results of this paper (for example concerning reform complementarities and endogeneity; see paragraph 30. ) also apply here.<sup>5/</sup>

#### Impact of Structural Reforms on Export Elasticities

	Manufactured exports			Services
	AMs	EMs	LIDCs	Non-LIDC
<b>Financial sector</b>				
Banking	+	-	+**	+***
Security Markets	+**	-	+	+***
<b>Openness</b>				
Tariff rates (average)	+	-	+	+***
<b>Institutions</b>				
Protection of property rights	+	+**	-	+**
Legal enforcement of contracts	-	+*	+	+**
<b>Product market regulation</b>				
Business regulations	+**	+	-	+**
Telecom & electricity regulation	+	-		+
<b>Labor market regulation</b>				
Hiring & firing regulations	+**	+		-
Centralized collective bargaining	+	+		-

Note. The table presents the sign of the  $\beta_2$  coefficient (see Footnote 1). Plus denotes larger elasticities in absolute terms. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1 percent levels respectively.

<sup>1/</sup> This box summarizes selected results from ongoing analytical work on structural reforms and external resilience.

<sup>2/</sup> The estimated equation is  $\Delta \log X_{it} = \beta_1 \Delta \log REER_{it-1} + \beta_2 \Delta \log REER_{it-1} \times S_{it-1} + \beta_3 S_{it-1} + \beta_4' Z_{it} + \omega_i + \eta_t + \varepsilon_{it}$ , where  $X_{it}$  is exports of country  $i$  in period  $t$ ,  $S$  is the structural reform of interest,  $Z$  is a set of control variables (trading partner growth and export goods inflation),  $\omega$  and  $\eta$  capture country and time fixed effects, respectively. We use the negative of CPI REER change, i.e. a depreciation has a positive sign. The effect of the structural indicators on the export elasticity is captured by the  $\beta_2$  coefficient on the interaction term. The equation is estimated on both manufactured and services exports using data averaged over three years. Most regressors are lagged to alleviate endogeneity concerns.

<sup>3/</sup> While some structural indicators are shown with a negative sign, not one of them is statistically different from zero.

<sup>4/</sup> A somewhat limited number of observations for LIDCs suggests a more cautious treatment of corresponding results.

<sup>5/</sup> A number of robustness checks were performed, including controls for the structure of the export basket (measured by the Economic Complexity Index), and different averaging periods (1 and 5 years).

## B. Large-Scale Reform Episodes

**26. Large-scale reforms also demonstrate a generally positive relationship with post-reform productivity growth.** To complement the regression analysis of general reform trends, we use positive ‘breaks’ in reform indices to identify large-scale reform episodes (i.e., the top three percent of positive changes). With a few exceptions, we find that reform episodes are typically associated with a significant pick up in post-reform productivity growth rates (Table 2). These simple computations broadly reinforce the findings of the regression analysis (including patterns relevant reforms across country groups).

However, these results also suggest that the pace or magnitude of reform could have implications for the potential benefits, although not all large-scale reforms have commensurately large impacts on productivity.

**27. Differences in the post-reform pickup in productivity growth underscore the need to calibrate the pace of reform depending on the reform type and the country group.** For instance:

- For some reforms, *more gradual implementation* may be likely to yield benefits, whereas rushed large-scale spending may have little or no benefits—or even have negative consequences. In the case of infrastructure, for example, Berg et al. (2012) show that in developing countries, large public investments financed by natural resource booms can undermine investment efficiency. A similar challenge may arise for AMs investing in knowledge capital (R&D spending).

**Table 2. Average Medium-term TFP Growth Gain After Breaks**

REFORMS	AM	EM	LIDC
<b>Financial Sector Reform</b>			
Banking system reform	Light Blue	Dark Blue	Light Blue
Interest controls		Light Blue	Light Blue
Credit controls		Light Blue	Light Blue
Privatization	Dark Blue	Dark Blue	Dark Blue
Supervision	Light Blue	Light Blue	Dark Blue
Capital market development		Light Blue	Dark Blue
<b>Trade Liberalization</b>			
Tariff rates (average)			
<b>Institutional Reform</b>			
Legal system and property rights			Dark Blue
<b>Infrastructure</b>			
Public capital stock			
<b>Market Deregulation</b>			
Agriculture		Dark Blue	Dark Blue
Policy environment for foreign investment	Light Blue	Light Blue	
Promotion of competition			
Hiring and firing regulations			
Collective bargaining			
Energy/Transport/Communications		Light Blue	
<b>Innovation</b>			
R&D Spending			

Note: The shading indicates the average TFP growth gains from 5 years before and after “breaks”. The dark blue indicates growth gain of 2 percentage points (ppt) or more, the light blue between 1 and 2 ppt, and blank is less than 1 ppt.

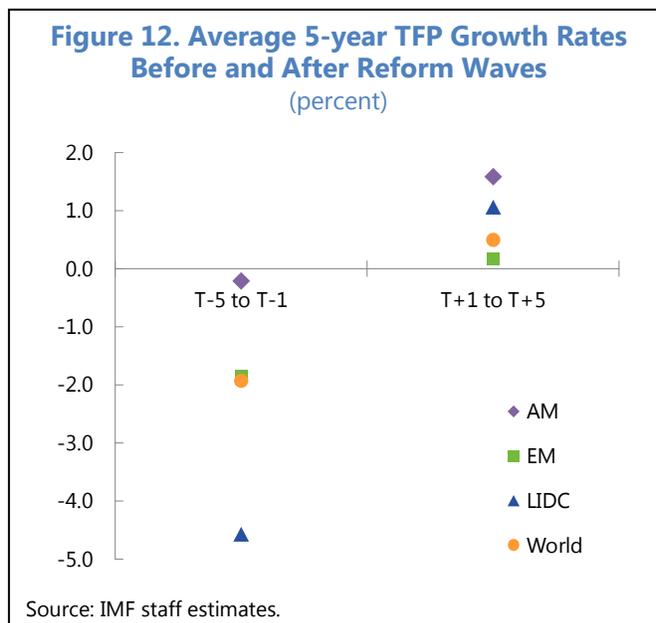
Source: IMF staff estimates.

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- Other reforms may be more amenable to a positive relationship with productivity growth when implemented through a “big bang” approach, rather than a more gradual manner. Here too, the results vary among country groups. For instance, “big bang” reforms in agriculture or the policy environment for foreign investment appear to be more valuable for EMs than slow and steady reforms in these areas.

### C. ‘Waves’ or Bundling of Reforms

**28. Even larger productivity payoffs are observed when multiple reform episodes occur in parallel.** In practice, reforms in different areas can, and often do, occur simultaneously or in “waves.” To examine whether reform “waves” further enhance the positive relationship with productivity, we consider instances when 3 or more large-scale reform episodes in different areas are implemented within the same 3-year period.<sup>11</sup> In these instances, there is a substantial uptick in 5-year average TFP growth rates after reform “waves” (Figure 12).<sup>12</sup> Specifically, AMs and EMs exhibited an average 2 percentage point pick-up in productivity growth, while LIDCs saw a much higher 5.5 percentage point increase. These productivity gains outstrip those associated with individual reform episodes.



**29. The magnitude of these productivity growth differentials supports the notion that reforms can have complementary effects.** While further work is needed to confirm this empirically, the common recurrence of particular reforms in “waves” adds credence to this notion. Among 34 identified reform “waves,” comprising 103 episodes, these most often included financial sector reforms (both banking system and capital market development). The prevalence of banking and capital market reforms in waves may well reflect the central role that the financial sector plays in efficiently allocating resources. The next most common reforms to occur in waves were legal system and trade reforms. For example, episodes of capital market reforms are often accompanied by strengthening the broader legal system and property rights.

### D. Interpret with Care

**30. While these broadly consistent empirical results provide some measure of comfort, the results should be interpreted with some caution.** The analysis above extracts useful information

<sup>11</sup> See Annex III for more details.

<sup>12</sup> For this calculation, we take the first year of the 3-year window as the reference point.

from the available data, but is not without some limitations. The first concerns data availability—there are certain types of structural reforms for which data is not available in a form amenable to regression analysis. Second, while the empirical results highlight statistical associations between the various types of reforms and productivity, they do not conclusively establish causality. Third, the regression results do not account for reform complementarities because the high correlation in reform indices requires them to enter the regressions one at a time. Fourth, measured TFP may also fall temporarily, introducing a downward bias on the results when the ultimate impact of the reform is still positive. The transition literature, for example, shows that reform often coincides with sharp declines in measured output as part of creative destruction—capital in inefficient places is idled, relative prices change, and resource reallocation incurs large initial costs.<sup>13</sup> Finally, while the empirical work considers one-year-ahead impacts and shows the results to be broadly robust to using longer lags or when considered over the longer-term, the objective of the analysis is not to establish the relationship between reforms and their time to impact, or between reforms and initial conditions. Having said that, the results do, however, suggest some promising areas for future research on these questions.

## SELECTED COUNTRY EXPERIENCES

*Given the need for care in interpreting these empirical findings, countries' reform experiences offer additional insights to help provide a more well-rounded basis for enhancing the Fund's approach to structural reforms. The six country cases examined for this paper tend to reinforce the messages from the empirical analysis, suggesting that sustained and well-coordinated reforms typically coincide with periods of improved productivity and macroeconomic performance more generally. Moreover, these experiences—as well as instances where reforms have proved less successful—hint at potential lessons about the ingredients for effective implementation and favorable outcomes.*

**31. Member countries' reform experiences are essential to developing a deeper understanding of the macroeconomic benefits of structural reform.** In this regard, the Fund is working to better leverage its existing country-based analytical work and share knowledge of cross-country reform experiences (e.g., see Box 2 and Annex I).<sup>14</sup> Continuing in this spirit, we examine six country cases to glean potential lessons to enrich the Fund's approach to structural reform issues and its engagement with member countries. The group of countries comprises: Armenia, Australia, Malaysia, Peru, Tanzania and Turkey.<sup>15</sup> In some instances, these cases consider longer term reform efforts in the context of structural transformation (e.g., Malaysia). Others focus on more concentrated reform periods (e.g., Peru in the 1990s). In addition to complementing the empirical

<sup>13</sup> See, e.g. Harvylyshyn, Izvorsky and van Rooden, 1998; Blanchard and Kremer, 1997.

<sup>14</sup> For example, the recent Board paper on [Fiscal Policy and Long-term Growth](#) (April 2015) incorporated a range of country case studies.

<sup>15</sup> This group includes at least one country from each income level and each geographic region. These cases are set out in a companion paper, [Structural Reforms and Macroeconomic Performance: Country Cases](#).

analysis in this paper, the potential lessons from countries' different approaches to designing and implementing reforms can point to avenues of future research and analysis.

**32. Acute economic pressures or crises are often a strong motivation for countries to undertake structural reforms.** For instance, Malaysia introduced an ambitious structural reform package, the *National Economic Recovery Plan*, to address the Asian crisis legacies of slow growth and financial system fragility. Similarly, Tanzania and Turkey undertook reforms in the wake of very weak growth, high inflation, and serious balance of payments pressures. In Armenia, the dissolution of the Soviet Union spurred a comprehensive rethink of the country's economic model. Australia was an exception, with broad-based structural reforms following a protracted period of mediocre growth. These experiences resonate with the broad trends and impetus from reforms in recent decades as noted in paragraph 18.

**33. In turn, concerted structural reforms have generally coincided with a turnaround in economic performance.** In each of these country cases, TFP growth picked up during the identified reform periods, in tandem with improved macroeconomic fundamentals. There was, however, some variation in the acceleration of TFP growth and the extent to which more favorable TFP growth was sustained following reforms. The more successful periods witnessed broad based macroeconomic benefits, with improvements in GDP growth and real GDP per capita—importantly, this pattern was evident for AMs, EMs, and LIDCs alike. Moreover, reforms arguably enabled some countries to be more resilient to shocks. For instance, around the time Australia was weathering the Asian crisis, Peru also withstood a series of external shocks between 1998 and 2001.

**34. These country cases send a strong signal about the likely conditions for undertaking successful reforms.** Importantly, structural reforms in and of themselves are not a 'silver bullet' for macroeconomic success. Strong ownership and the ability to sustain reforms appear to be crucial to reaping the productivity and growth benefits. Indeed, without sustained reforms, improvements in macroeconomic performance may be short-lived. In this regard, the domestic political context and the ability to garner strong and broad-based buy-in appear to be critical in being able to implement complementary macroeconomic and structural reforms, to make effective choices about combining and sequencing reforms, and to mitigate the risks of reform reversals.

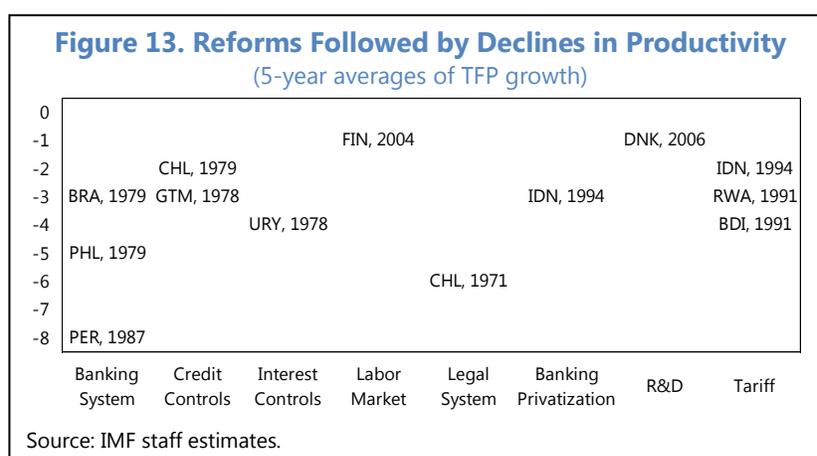
- While most specific reforms were undertaken over a short period of time, successful reforms were typically implemented in sequence and as part of a 'wave' of reforms intended to reinforce and complement one another. In this regard, the benefits of one-off reforms were less apparent than of reform 'waves.' Moreover, the pattern of reforms appeared to evolve in a broadly similar way across countries and over time. Typically, trade and price liberalization (including in the banking sector) were implemented first (Armenia, Australia, Tanzania, Malaysia and Turkey), followed by privatization and banking supervision and legal reforms.
- The most successful reform periods reflected a more comprehensive approach, where sound macroeconomic policies were an essential complement to structural reforms. As macroeconomic stresses (e.g., high inflation in Turkey) can derail growth prospects despite sustained structural

reforms, credible fiscal and monetary policy frameworks are a vital ingredient to successful outcomes (Armenia, Australia, Malaysia and Tanzania).

- In this regard, almost all cases of fiscal structural reforms played a pivotal role in stabilizing the macroeconomic situation. Most often this involved a combination of measures to strengthen tax administration, spending efficiency and fiscal frameworks (e.g., Armenia, Australia, Malaysia, and Peru).

### 35. Circumstances where structural reforms have not yielded success can be equally

**instructive.** The reform indices used in the empirical analysis also allow us to identify cases where TFP growth has shown negligible improvement or has even been negative following reforms. Figure 13 shows instances where reforms were followed by periods of negative TFP growth. In order to help member countries design and implement future reforms, it is important to understand the factors underlying those unfavorable outcomes. In many instances, these lessons reinforce those from the reform successes, including the need to understand specific country circumstances in order to calibrate the timing, pace and sequencing of reforms.



- Given that sustained reforms are more likely to generate prolonged benefits, the design of reform packages should account for macroeconomic stability and domestic political economy considerations. While large external shocks or crises provide an opportune time to implement reforms, they can also have damaging effects to existing reform efforts. Similarly, political economy factors are essential elements in enacting and sustaining reforms (Hoj, 2006).
- Binding constraints to economic performance can vary across countries (Hausmann et al., 2005), reinforcing the need to tailor reforms to country circumstances. Christiansen et al. (2009) find that weak institutions could be one such constraint for reaping the benefits of reforms. Macroeconomic stability can also be a binding constraint (Lora and Panizza, 2002), reinforcing the point above about the merits of sound macroeconomic policies or, where needed stabilization policies accompanying structural reforms.
- How quickly or extensively to reform is a pivotal decision. Some argue that lack of success is because reforms either did not go far enough or, at the other extreme, were too dramatic (Zettelmeyer, 2012). This is evidenced in our break analysis where most, but not all large reforms, had a substantial positive impact on productivity. However, it underscores the need for countries to effectively prioritize and pace reforms. It also highlights the risk of viewing reforms

in a too linear or simplistic fashion—in many instances, unconstrained liberalization can be problematic. For instance, prior to Chile’s reform successes, the improvement in TFP growth following banking reforms in the 1970s was short-lived (Figure 13), possibly reflecting too rapid or unbalanced reforms (e.g., weak supervision in the new deregulated financial market). These lessons were reflected in subsequent banking reforms that were more measured, and included supervisory reforms as a core element.

## REFORM NEEDS AND OPERATIONAL PRIORITIES

*Country experiences and different approaches to reform—such as the apparent merits of waves of reforms—suggest that prioritization is a central consideration for effective implementation. Given the breadth of structural reforms that can benefit macroeconomic performance, it is essential to begin to understand how countries might prioritize their reform efforts. Efforts to identify member countries’ current reform needs suggest that the Fund is already focusing on reforms most likely to have macro-payoffs. Looking ahead, this can also help inform efforts to build a macrostructural toolkit to support country-tailored analysis and deeper engagement with member countries.*

### A. Member Countries’ Current Reform Needs

**36. For the Fund to appropriately orient its efforts, it is important to have a clear sense of the structural issues currently foremost on policymakers’ minds.** As a preliminary step toward a more systematic “bottom up” diagnosis of countries’ structural reform challenges, a recent survey of IMF mission chiefs<sup>16,17</sup> sought to gauge the extent to which different types of structural issues are most relevant for member countries’ macroeconomic performance.

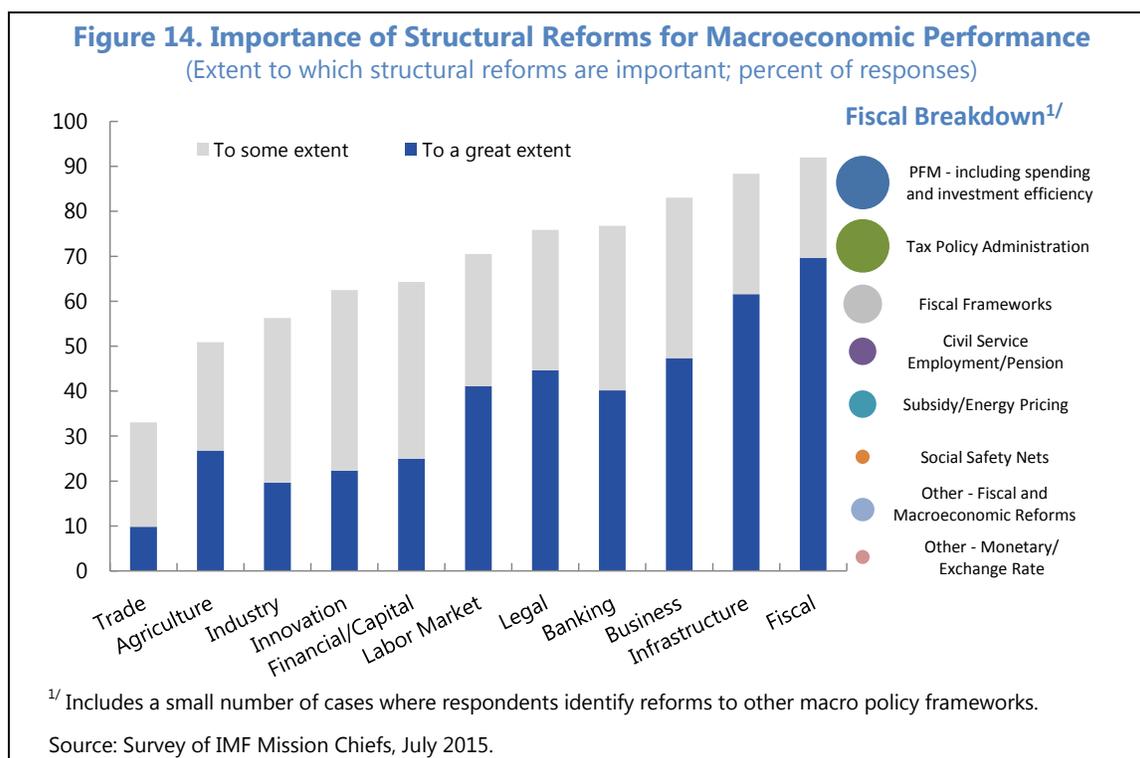
**37. The survey results confirm that a wide range of structural reforms are regarded as having a bearing on macroeconomic performance.** While all reform categories considered in the context of the empirical analysis above were considered to be macro-relevant, seven of these categories were considered to be macroeconomically important by over two-thirds of respondents (Figure 14). The wide interest in banking and other financial market reforms is consistent with the increased focus on financial stability since the crisis, including aspects related to cross-border flows and spillovers, and the growing role of non-banks. The same could be true of labor market issues in light of persistently high unemployment and the need to generate job-rich growth. The strong interest in infrastructure and legal system reforms is largely driven by EMs and LIDCs. Similarly, compared to the broader membership, fragile states place more importance on agriculture, legal and business reforms, and infrastructure.

<sup>16</sup> In July 2015, staff conducted a survey of IMF Mission Chiefs for the Fund’s 188 member countries. The average response rate was around 60 percent, with a response rate above 50 percent for mission chief’s representing all regions and income groups. Further information on the survey questions and response rates are set out in Annex IV.

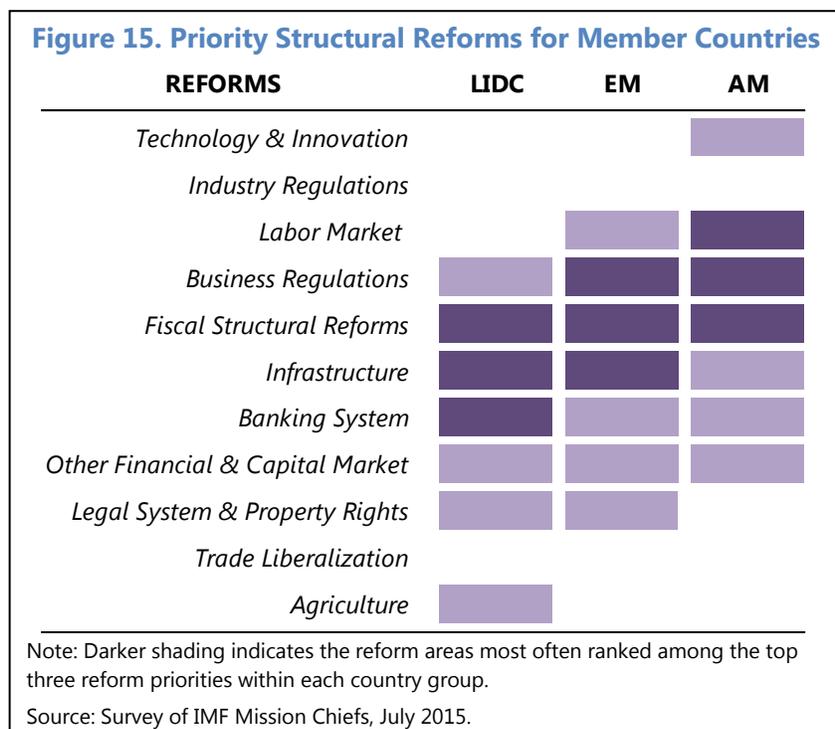
<sup>17</sup> While the survey results offer insights into the potential range of macro-relevant structural issues, they should be regarded as preliminary and not be taken to represent the views of country authorities.

**38. Fiscal structural reforms are also considered by almost all respondents to be important for macroeconomic performance** (over 90 percent), in keeping with the Fund's core business.

While this reflects a range of different types of fiscal reforms, three areas dominated: tax administration; public financial management and spending efficiency; and fiscal frameworks. There was broad recognition of the macro-importance of tax policy administration reforms across all income groups. However, EMs tended to see more value-added in reforming fiscal frameworks. Also, while LIDCs emphasized the importance of public financial management reforms, AMs and EMs focus on more general aspects of spending and investment efficiency. Although subsidy and energy pricing reforms were rated somewhat lower on average, these tended to be a higher priority for EMs and LIDCs, as well as oil/commodity producing economies.



**39. The highest priority reforms identified by respondents suggest that structural reform needs evolve across different stages of development** (Figure 15). On the one hand, the survey responses reveal several common reform priorities across all member countries. In addition to a strong common interest in fiscal reforms (noted above), there is a shared interest in banking and other financial and capital market reforms, infrastructure, and the business environment. As inferred by the earlier empirical analysis and country cases, the different priority reforms tend to reflect different stages of economic development. For instance, agricultural reforms appear to be relatively more important among LIDCs, and legal system reforms more important among LIDCs and EMs, whereas labor market issues become more relevant for EMs and AMs, and only AMs prioritize technology reforms.



**40. The few instances where priority reforms diverge from historical reform patterns or country experiences appear to reflect the evolving nature of economies.** For instance, following concerted trade liberalization reforms by LIDCs in recent decades, their reform efforts may be more focused on other aspects of trade reform (such as export diversification and integrating with global value chains). Similarly, AMs have a renewed interest in other financial market reforms given the growing role of non-banks and considerations related to expanding the regulatory perimeter. This suggests that the Fund is already focused on those reforms likely to have the highest payoff for macroeconomic performance, with due regard for changing circumstances and country specificities.

## B. The Fund's Operational Focus on Structural Reforms

**41. Looking ahead, the Fund's operational efforts should be geared to better supporting countries' macro-relevant reform needs.** Our engagement with individual countries should be tailored to the reform priorities most relevant for their specific macroeconomic circumstances. However, to avoid an ad hoc approach, the TSR recommended a principles-based approach to help guide and articulate the macro-relevance of structural reforms. More broadly, the TSR emphasized the desirability of delivering more expert analysis and advice. To this end, institution-wide efforts should be geared toward developing and leveraging high quality and expert analysis and advice on structural issues, guided by three broad principles.

- One, the Fund should be equipped to *recognize* all macro-critical structural issues and highlight the macroeconomic implications in its surveillance.

- Two, although the Fund should limit its policy *advice* to areas where it has the necessary expertise, there may be merit in cautiously building further expertise in selected macro-critical areas of high impact and high demand—avoiding institutional overreach and guided by the rationale in Box 3.
- Three, where structural reforms have macro-implications, but remain clearly outside the Fund’s core areas of expertise, the Fund should explore opportunities to better leverage or strengthen interagency collaboration mechanisms to draw on appropriate outside expertise.

The macro-structural relationships outlined in this paper—both empirical and country-based—can inform judgments about implementing these principles, and prioritizing the Fund’s efforts.

**42. The earlier empirical analysis can help gauge the relative benefits of different reforms for each country group, providing a starting point toward operationalizing these principles.**

Table 1 provides a basis for such an exercise—it indicates the relative impact of each type of reform across country groups, but not the impact of different reforms within any given country group. To take this extra step, it is useful to consider the “distance-to-best practice” for countries in each group, defined as the gap between the top performer in each group and the bottom 25<sup>th</sup> percentile in each reform index. Multiplying this gap by the initial regression coefficients (Table 1) provides an estimate of the expected productivity payoff from

**Table 3. Productivity Gains from Different Structural Reforms**

REFORMS	AM	EM	LIDC
<b>Financial Sector Reform</b>			
Banking system reform	Light Purple	Light Green	Blue
Interest controls			Light Blue
Credit controls		Light Green	Blue
Privatization		Light Green	Light Blue
Supervision	Light Purple	Light Green	Blue
Capital market development		Light Green	Light Blue
<b>Trade Liberalization</b>			
Tariff rates (average)			Light Blue
<b>Institutional Reform</b>			
Legal system and property rights		Light Green	Light Blue
<b>Infrastructure</b>			
Public capital stock	Dark Purple	Dark Green	Blue
<b>Market Deregulation</b>			
Agriculture			Blue
Policy environment for foreign investment	Light Purple		
Promotion of competition		Dark Green	
Hiring and firing regulations	Dark Purple	Dark Green	
Collective bargaining	Light Purple	Light Green	
Energy/Transport/Communications	Light Purple		
<b>Innovation</b>			
R&D Spending	Dark Purple		

Note: Comparisons across reforms within each country group. Darker shades imply larger gains from reforms.

Source: IMF staff estimates.

closing this reform gap in each country group (Table 3). As the gap does not depend on the particular scaling system of any reform index, this allows the estimated productivity gains to be compared across reform indices. In effect, this indicates the relative effectiveness of each reform in delivering higher productivity growth for each country group (where the darker shades imply relatively larger gains).

**43. The reform priorities that emerge resonate with the historical reform patterns and country reform experiences examined earlier.**

- Differing priorities among country groups suggest that reform needs evolve as an economy develops. For instance, the relatively important reforms for LIDCs—such as *agriculture*—are consistent with early stages of development when economies are more agricultural and markets are less well developed. Structural reforms that produce the largest TFP growth gains for EMs focus on improving market functioning as they become more industrialized—e.g., *business regulation*. For AMs, priority reforms are geared toward supporting more technologically advanced economies, with more well developed labor and product markets—*innovation* (particularly for those closest to the technology frontier) and *labor market reforms*.
- At the same time, two common priorities emerge from this exercise. *Infrastructure* and *banking reforms* both have the potential for high productivity payoffs in all country groups, reflecting their centrality to the effective functioning of any economy. However, differences among the various aspects of *banking reforms* signals the importance of a more nuanced (or non-linear) interpretation. A wider range of banking system reforms are important for EMs and LIDCs, perhaps as they stand to benefit most from fundamental reforms and financial deepening. Reforms to banking *supervision*, on the other hand, are the priority for AMs, underscoring the importance of adopting balanced and holistic reforms, rather than simply pursuing liberalization unchecked.

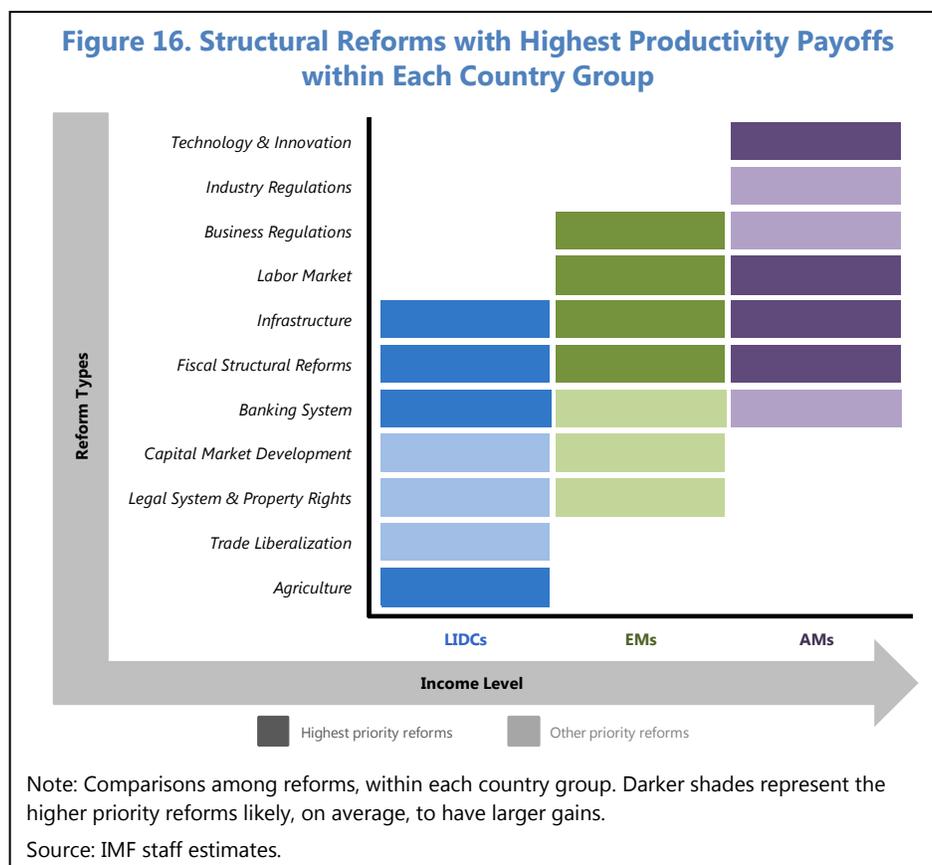
**44. Beyond these empirically driven priorities, there is strong evidence that fiscal structural reforms are also a top priority.** Where there is clear evidence from other sources, the Fund’s operational approach should not be constrained by available reform indices. This is the case, in particular, with fiscal structural reforms. The country case studies demonstrated the importance of fiscal structural reforms for macroeconomic performance,<sup>18</sup> as well as the broader success of countries’ structural reform efforts. Similarly, the survey results point to strong demand across the entire membership in this area. The Fund’s existing expertise and depth of knowledge in this area ensures that it has been, and will continue to be, the principal provider of expert analysis and advice in many aspects of fiscal structural reform across all parts of the membership.

**45. Collectively, this can inform how member countries and the Fund think about prioritizing structural reforms issues.** It makes intuitive sense that countries focus on those reform

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<sup>18</sup> The paper on [Fiscal Policy and Long-term Growth](#) also reiterated their importance for growth, and offered concrete suggestions on priority tax and expenditure policies that can help promote growth (see Table 1 of that paper).

areas likely to yield the largest payoffs. For the Fund as well, it is critical to prioritize, not just in tailoring its country-level analysis and advice, but in deciding at an institutional level where to build capacity and where to rely on other institutions (cognizant of both resource constraints and the Fund’s mandate). The reform priorities draw from the range of approach above—empirical, as well as survey- and country-based—can be presented in a stylized “heatmap” of structural priorities (Figure 16) that could help guide the Fund’s operational priorities in this area. While these reforms may not always reflect individual priorities, it provides a basis for considering where, on average, there is most value in the Fund “building” versus “borrowing” capacity.



**46. In addition to *which* reforms to prioritize, this paper touches on aspects of reform implementation that merit attention in future analytical work.** For instance, the pace of reform appears to matter for productivity growth as much as the type reform. Similarly, there appear to be benefits in implementing multiple reforms simultaneously (‘waves’). While these are intuitively sensible lessons, further analytical work is needed to understand these issues more fully (e.g., which reforms at which pace, or which reforms are best bundled together in ‘waves’). Over time, these factors will help inform decisions about how to translate the ‘heatmap’ to individual country circumstances.

## IMPLICATIONS AND NEXT STEPS

**47. The analysis presented above can help guide the Fund in supporting countries' macro-structural policy needs in several ways.** At an institutional level, this helps to direct the Fund's efforts towards reforms that, on average, are likely to offer the global economy the best chance of securing higher and more durable growth. Thus, this approach provides a basis for collaborating with other agencies and in guiding where the Fund may wish to enhance its own capacity to provide advice. This is not to say that macrostructural analysis and advice in individual cases should be limited to those areas, or indeed that they necessarily should even cover those areas. Ultimately, Article IV consultations should always be country-specific. Thus, the primary goal of the 'heatmap' and this institutional approach is to develop a richer analytical foundation and range of diagnostic tools—either from within the Fund or from partnering institutions—that country teams can leverage in their analysis and advice.

**48. The analysis allows us to identify more clearly those reform areas to which the Fund's operational efforts should be geared.**

- The Fund has a clear comparative advantage and should continue building upon it in fiscal structural and financial sector reforms—at the center of the 'heatmap' (Figure 16). As the only multilateral institution focusing on macroeconomic policy with near universal membership, the Fund should continue to take primary responsibility for providing expert analysis and advice in these areas.
- Moving away from the center of the 'heatmap', there are a number of reform areas where the Fund has no comparative advantage. As these are areas where there is also less likely to be widespread demand across the membership, the Fund should actively seek to collaborate with and leverage other institutions' expertise to provide country-specific analysis (such as innovation or product market reforms (OECD) or agriculture (World Bank)).
- There are however two areas at the center of the 'heatmap'—labor market and infrastructure—that may not be traditional for the Fund or where the Fund may not have established expertise, but are more likely to have a significant bearing on macroeconomic performance for a 'critical mass' of the membership (Figures 14-15). In this context, the Fund may need to scale up its efforts, building on existing or developing new in-house expertise.

**49. Four complementary tracks of future work can help move this agenda forward**, with a view to developing a deeper understanding of the likely impact of reforms and importantly country needs, as well as enhancing the information and diagnostic tools available for surveillance.

- *Country needs:* To ensure that the Fund's approach reflects more fully a "bottom up" diagnosis of country needs, staff will look to engage more directly with country authorities to better understand the "demand side" of macro-relevant structural reforms. Also, staff will systematically

catalogue the coverage of structural issues, and identify good practices, in recent Article IV reports.

- *Ongoing analytical work:* Staff will continue analytical work across the Fund on the various macroeconomic effects of structural reforms, guided by the Fund's mandate and principles outlined in this paper. That is not to say that all research and policy development should mirror the 'heatmap.' Indeed, and as noted earlier, the complexity of the relationship between structural reforms and macroeconomic outcomes warrants further examination.
  - Ongoing analytical work across the Fund will reinforce efforts to build expertise on specific structural issues. Labor and product market reforms feature prominently in the near-term research agenda of both functional and area departments. For instance, further work on labor and product market reforms in the Spring 2016 WEO and by the European Department. Another possible area for further work would be on successfully addressing infrastructure gaps in EMs.
  - Beyond this, future work should also consider expanding the analysis in this paper to focus on other non-TFP benefits of reform, such as resilience (particularly important given the central role of stability in the Fund's mandate), financial stability (including the relationship between financial development/deepening and reform), and inclusive growth. Also, while the empirical work in this paper provides some tentative insights regarding the timing and durability of the impact on productivity of various reforms, it also suggests the need for further research before they can be affirmed definitively.
  - The same is true concerning the insights gained, largely from the country cases, on aspects of implementation. Here, possible areas of future work could consider the role of initial conditions, the interaction between structural reforms and other levers of macroeconomic policy, the timing of reforms, or the costs associated with implementing reforms.
- *Toolkit and operational issues:* Staff will consider modalities and processes to more explicitly incorporate macrostructural issues in the review process and to more actively support country teams. In the context of building a macrostructural toolkit to help staff leverage analytical work and cross-country experiences, an immediate priority will be to put in place mechanisms to disseminate existing analytical work and policy experiences (including the material in Annex I and drawing on ongoing work to identify good practices in recent Article IV reports).
- *Interagency collaboration:* Based on the preliminary understanding (above) of where the Fund needs to build its own expertise and where the Fund should leverage the expertise of other institutions, staff will develop clearer protocols and modalities for inter-agency collaboration. Where possible, staff will look to build on, or draw lessons from, existing dialogue (e.g., with the OECD on product and labor market issues).

**50. As part of a broader and longer term agenda, staff will look for opportunities to keep the Board apprised of the various elements of this work.** The next major opportunity to engage the Board will be in the context of the 2017 interim assessment of TSR implementation, at which time staff will assess progress on these four tracks of work on structural reforms and, if necessary, identify the need for any reorientation of approach ahead of the 2019 TSR.

## ISSUES FOR DISCUSSION

- 51.** Do Directors find the approach outlined above a useful device to help prioritize the Fund's institutional focus on structural issues?
- 52.** Do Directors agree that this helps provide a more strategic approach to selectively strengthen the Fund's macrostructural analytical work and tools?
- 53.** Do Directors agree with the forward-looking analytical agenda on structural reforms?
- 54.** Do Directors concur that labor markets and infrastructure are areas in which the Fund may need to scale up its expertise?
- 55.** Do Directors see merit in exploring options to enhance interagency cooperation and coordination, with the focus outlined above?

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<sup>19</sup> These references are principally by external authors or publications; Fund analytical papers referenced in this document are generally listed in Annex I.

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## Annex I. Recent Macrostructural Analytical Work at the Fund

This Annex presents selected recent analytical work by IMF staff on macro-relevant structural reforms and policy issues. It includes policy papers presented to the Executive Board, cross-cutting analytical work, as well as analysis done in the context of multilateral and bilateral surveillance.<sup>1</sup>

Table A. Fund Board Papers on Macrostructural Issues		
Reference/Title	Coverage	Reform or Policy Issue
<i>Current Challenges in Revenue Mobilization</i> (2015)	AM, EM, LIDC	Revenue administration
<i>Fiscal Policy and Long-term Growth</i> (2015)	AM, EM, LIDC	Fiscal structural reforms
<i>Making Public Investment More Efficient</i> (2015)	AM, EM, LIDC	Public investment
<i>Update on Fiscal Transparency Initiative</i> (2014)	AM, EM, LIDC	Fiscal transparency
<i>Spillovers in International Corporate Taxation Policy</i> (2014)	AM, EM, LIDC	Tax policy
<i>Fiscal Policy and Income Inequality</i> (2014)	AM, EM, LIDC	Fiscal redistribution
<i>Budget Institutions in G-20 Countries</i> (2014)	G-20	Budget institutions
<i>Long-Run Growth and Macroeconomic Stability in Low-Income Countries—The Role of Structural Transformation and Diversification</i> (2014)	LIDC	Export diversification; product market
<i>Jobs and Growth—Analytical and Operational Considerations for the Fund</i> (2013)	AM, EM, LIDC	Labor market
<i>Macroeconomic Policy Frameworks for Resource-Rich Developing Countries</i> (2012)	EM, LIDC	Fiscal structural reforms
<i>Fiscal Transparency, Accountability, and Risk</i> (2012)	AM, EM, LIDC	Fiscal transparency
<i>Fiscal Policy and Employment in Advanced and Emerging Economies</i> (2012)	AM, EM	Labor market
<i>Revenue Mobilization in Developing Countries</i> (2011)	LIDC	Tax policy
<i>The Challenge of Public Pension Reform in Advanced and Emerging Economies</i> (2011)	AM, EM	Pension
<i>Macro-fiscal Implications of Health Care Reforms in Advanced and Emerging Economies</i> (2010)	AM, EM	Health care

<sup>1</sup> Based on inputs provided by area and functional departments. Includes only documents already published. An expanded version of this list will be made available to staff as a step toward building a macrostructural toolkit for staff to facilitate sharing of expertise and country experiences.

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Table B. Fund Analytical Papers on Macrostructural Issues		
Reference/Title	Coverage	Reform or Policy Issue
<i>Inequality and Fiscal Policy</i> , IMF (2015) B. Clements, R. de Mooij, S. Gupta and M. Keen	AM, EM, LIDC	Fiscal Redistribution
<i>Equitable and Sustainable Pensions: Challenges and Experience</i> , IMF (June 2014) B. Clements, F. Eich and S. Gupta	AM, EM	Pension
<i>Assessing the Gains from Structural Reforms for Jobs and Growth</i> , in "Jobs and Growth: Supporting the European Recovery," (April 2014) D. Anderson, B. Bergljot, L. Lusine and D. Muir	Europe	Product market; labor market
<i>Designing a European Fiscal Union. Lessons from the Experience of Fiscal Federations</i> (2014), C. Cottarelli and M. Guerguil	AM, EM	Fiscal framework
<i>Getting Energy Prices Right—from Principle to Practice</i> (2014), I. Parry, D. Heine, E. Lis and S. Li	AM, EM, LIDC	Energy subsidies
<i>Jobs and Growth: Supporting the European Recovery</i> (2014)	Europe	Large-scale reforms
<i>Energy Subsidy Reform: Lessons and Implications</i> (2013)	AM, EM, LIDC	Energy subsidies
<i>Public Financial Management and Its Emerging Architecture</i> , IMF (2013) M. Cangiano, T. Curristine and M. Lazare	AM, EM, LIDC	Budget institutions and management
<i>The Economics of Public Health Care Reform in Advanced and Emerging Economies</i> , IMF (June 2012) D. Coady, B. Clements and S. Gupta	AM, EM	Health care
<i>Fiscal Policy to Mitigate Climate Change: A Guide to Policymakers</i> , IMF (2012) R. de Mooji, M. Keen and I. Parry	AM, EM, LIDC	Climate change
<i>The Taxation of Petroleum and Minerals: Principle, Problems, and Practice</i> , (2010) P. Daniel, M. Keen and C. McPherson	AM, EM, LIDC	Tax policy
<i>Department Paper 14/3, Subsidy Reform in MENA: Recent Progress and Challenges Ahead</i> , C. Sdravovich, et al.	MENA	Subsidy reform
<i>Departmental Paper 14/1, Toward New Horizons: Arab Economic Transformation Amid Political Transition</i> , D. Gressani, H. Finger, et al.	MENA	Growth
<i>IMF Occasional Paper No. 268, Structural Reforms and Economic Performance in Advanced and Developing Countries</i> , Ostry, Jonathan David; Prati, Alessandro; Spilimbergo, Antonio (2009)	AM, EM, LIDC	Large-scale reforms
<i>SDN 15/19, A Strategy for Resolving Europe's Problem Loans</i> , S. Aiyar, et al.	Europe	Insolvency reform/NPL resolution
<i>SDN 15/11, Is the Glass Half Empty or Half Full? Issues in Managing Water Challenges and Policy Instruments</i> , (includes five Burkina Faso, Country Case studies), K. Kochhar, C. Pattillo, Y. Sun, N. Suphaphiphat, A. Swiston, R. Tchaidze, B. Clements, S. Fabrizio, V. Flamini, L. Redifer, H. Finger, and an IMF Staff Team	AM, EM, LIDC, Burkina Faso, DRC, Pakistan, Singapore, and Yemen	Water management
<i>SDN 15/08, Rethinking Financial Deepening: Stability and Growth in Emerging Markets</i> , R. Sahay, M. Cihak, P. N'Diaye, A. Barajas, R. Bi, D. Ayala, Y. Gao, A. Kyobe, L. Nguyen, C. Saborowski, K. Svirydzenka and S. Yousefi	EM	Financial deepening
<i>SDN 15/07, Revitalizing SME Securitization in Europe</i> , Aiyar, S., Al-Eyd, A., Barkbu, B. and A. Jobst	Euro Area	Financial sector

**Table B. Fund Analytical Papers on Macrostructural Issues (cont.)**

Reference/Title	Reference/Title	Reference/Title
SDN 15/04, <i>Tackling Small and Medium Sized Enterprise Problem Loans in Europe</i> , W. Bergthaler, K. Kang, Y. Liu and D. Monaghan	Europe	Insolvency reform/NPL resolution
SDN 15/03, <i>The New Normal: A Sector-level Perspective on Productivity Trends in Advanced Economies</i> , E. Dabla-Norris, M. Guo, V. Haksar, M. Kim, K. Kochhar, K. Wiseman and A. Zdzienicka	AM	Large-scale reforms
SDN 15/02, <i>Fair Play: More Equal Laws Boost Female Labor Force Participation</i> , C. Gonzales, S. Jain-Chandra, K. Kochhar and M. Newiak	AM, EM, LIDC	Labor market; gender
SDN 14/11, <i>Youth Unemployment in Advanced Economies in Europe: Searching for Solutions</i> , A. Banerji, et al.	Europe	Unemployment; labor market
SDN 14/10, <i>Making the Most of Public Investment in MENA and CCA Oil-exporting Countries</i> , M. Albino-War, et al.	MENA, CCA	Public investment
SDN 14/02, <i>Redistribution, Inequality, and Growth</i> , Jonathan D. Ostry, A. Berg, and C. G. Tsangarides	AM, EM, LIDC	Inclusive growth
SDN 13/10, <i>Women, Work, and the Economy: Macroeconomic Gains From Gender Equity</i> , K. Elborgh-Woytek, M. Newiak, K. Kochhar, et al.	AM, EM, LIDC	Labor market; gender
SDN 13/09, <i>Toward a Fiscal Union for the Euro Area</i> , C. Allard, P. Koeva Brooks, J. Bluedorn, F. Bornhorst, K. Christopherson, F. Ohnsorge, T. Poghosyan and IMF Staff Team	Euro Area	Fiscal framework
SDN 13/08, <i>Anchoring Growth: The Importance of Productivity-Enhancing Reforms in Emerging Market and Developing Economies</i> . <i>Journal of International Commerce, Economics and Policy</i> , E. Dabla-Norris, G. Ho, K. Kochhar, A. Kyobe and R. Tchaidze.	EM, LIDC	Large-scale reforms
SDN 13/01, <i>A Banking Union for the Euro Area</i> , R. Goyal, P. Koeva Brooks, M. Pradhan, T. Tressel, G. Dell'Ariccia, R. Leckow, C. Pazarbasioglu and IMF Staff Team	Euro Area	Financial sector
SDN 12/07, <i>Fostering Growth in Europe Now</i> , B. Barkbu, R. Jesmin, V. Rodrigo and IMF staff team	Europe	Product market; labor market
SDN 11/08, <i>Inequality and Unsustainable Growth: Two Sides of the Same Coin?</i> A. Berg and J. Ostry	AM, EM, LIDC	Inclusive growth
SDN 09/28, <i>Climate Policy and the Recovery</i> , B. Jones and M. Keen	AM, EM, LIDC	Climate change
WP 15/76, <i>Recent U.S. Labor Force Dynamics: Reversible or Not</i> , R. Balakrishnan, M. Dao, J. Sole, J. Zook	USA	Labor market
WP 15/62, <i>RSD 2015, Estimating Potential Growth in the Middle East and Central Asia</i> , P. Mitra, et al.	MCD	Potential growth
WP 15/51, <i>Structural transformation—How Does Thailand Compare?</i>	Thailand	Structural transformation
WP 15/46, <i>Interconnectedness, Systemic Crises and Recession</i> , E. Vega and S. Russell	...	Macrofinancial linkages
WP 15/45, <i>Made in Mexico: Energy Reform and Manufacturing Growth</i> , A. Jorge and F. Valencia	Mexico	Energy; manufacturing growth

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Table B. Fund Analytical Papers on Macrostructural Issues (cont.)		
Reference/Title	Reference/Title	Reference/Title
WP 15/32, <i>Investment in the Euro Area: Why has it Been Weak?</i> , B. Barkbu, P. Berkmen, J. Bluedorn, P. Lukyantsau, S. Saksonov and H. Schoelermann	Euro Area	Investment
WP 15/31, <i>Can Islamic Banking Increase Financial Inclusion?</i> , S. Naucer, A. Barajas, A. Massara	AM, EM, LIDC	Financial Inclusion
WP 15/30, 2015, <i>Energy Subsidies in Latin America and the Caribbean: Stocktaking and Policy Challenges</i> , G. Di Bella, L. Norton, J. Ntamatungiro, S. Ogawa, I. Samaké and M. Santoro	Latin American and Caribbean	Energy subsidies
WP 15/25, <i>Harnessing Resource Wealth for Inclusive Growth in Fragile States</i> , C. Delechat, W. Clark, P. Gupta, M. Kabedi-Mbuyi, M. Koulet-Vickot, C. Macario, T. Orav, M. Rosales, R. Tapsoba, D. Zhdankin and S. Yang	Fragile States	Fiscal structural reforms
WP 15/22, <i>Identifying Constraints to Financial Inclusion and Their Impact on GDP and Inequality: A Structural Framework for Policy</i> , E. Dabla-Norris, Y. Ji, R. Townsend and D.F. Unsal	Egypt, Kenya, Malaysia, Mozambique, the Philippines, Uganda	Financial inclusion
WP 15/16, <i>U.S. Total Factor Productivity Slowdown: Evidence from the U.S. States</i> , R. Cardarelli and L. Lusinyan	USA	Productivity
WP 14/221, <i>Cashing in for Growth: Corporate Cash Holdings as an Opportunity for Investment in Japan</i> , G. Sher	Japan	Corporate governance
WP 14/153, <i>Unemployment and Structural Unemployment in the Baltics</i> , C. Ebeke and G. Everaert	Europe	Unemployment; labor market
WP 14/148, <i>Public Investment as an Engine of Growth</i> , A. Warner	AM, EM, LIDC	Public Investment; infrastructure
WP 14/141, <i>Balance Sheet Repair and Corporate Investment in Japan</i> , J.S. Kang	Japan	Investment
WP 14/115, <i>Labor Market Issues in the Caribbean: Scope to Mobilize Employment Growth</i> , M. E. Kandil, G. Lindow, M. Mansilla, J.C. Okwuokei, J. Schmittmann, Q. Chen, X. Li, M. Santoro, S. Stavits	Caribbean, Trinidad and Tobago	Labor market
WP 14/113, <i>France, Article IV, The EU Services Directive: Gains from Further Liberalization</i> , E.F. Corugedo and E.P. Ruiz	France	Services sector; productivity
WP 14/54, <i>How can Korea Boost Potential Output to Ensure Continued Income Convergence?</i> S. Jain-Chandra and L. Zhang	Korea	Structural reforms; potential growth
WP 14/36, <i>Assessing Countries' Financial Inclusion Standing—A New Composite Index</i> , G. Amidzic, A. Massara and A. Mialou	AM, EM, LIDC	Financial inclusion
WP 13/240, <i>Sector-Level Productivity, Structural Change, and Rebalancing in China</i> , M. Nabar and K. Yan	China	Structural transformation
WP 13/237, <i>The Investment-Financing-Growth Nexus: The Case of Liberia</i> , W. Clark and M. Rosales	LIDCs	Fiscal structural reforms
WP 13/204, <i>Enhancing China's Medium-Term Growth Prospects : The Path to a High-Income Economy</i> , M. Nabar and P. N'Diaye	China	Structural transformation
WP 13/202, <i>The Path to Higher Growth : Does Revamping Japan's Dual Labor Market Matter?</i> C. Aoyagi and G. Ganelli	Japan	Labor market

**Table B. Fund Analytical Papers on Macrostructural Issues (concluded)**

Reference/Title	Reference/Title	Reference/Title
WP 13/196, <i>Is Labor Market Mismatch a Big Deal in Japan?</i> I. Shibata	Korea	Labor market
WP, 13/175, <i>Financial Interconnectedness and Financial Sector Reforms in the Caribbean</i> , S. Ogawa, J. Park, D. Singh and N. Thacker	Caribbean	Financial interconnectedness; regulation and supervision
WP 13/97, <i>Productivity or Employment: Is it a Choice?</i> A. De Michelis, M. Estevao and B.A. Wilson	Dominican Republic	Labor market
WP 13/44, <i>Dealing with Private Debt Distress in the Wake of the European Financial Crisis: A Review of the Economics and Legal Toolbox</i> , Y. Liu and C. Rosenberg	Europe	Insolvency reform/NPL resolution
WP 13/40, <i>Growth and Employment in the Dominican Republic: Options for a Job-Rich Growth</i> , U. Abdullaev and M. Estevao	Dominican Republic	Labor market; productivity
WP 12/244, <i>Jamaica Debt Exchange</i> , D. Grigorian, T. Alleyne and A. Guerson	Jamaica	Sovereign debt management
WP 11/248, <i>The Role of Structural Reforms in Raising Economic Growth in Central America</i> , S. Cas, A. Swiston and L.D. Barrot	Central America, El Salvador	Structural reforms; growth

## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE

Table C. Multilateral Surveillance-related Products on Macrostructural Issues		
Reference/Title	Sample	Reform or Policy Issue
GFSR, October 2014, Chapter 3, <i>Risk Taking by Banks: The Role of Governance and Executive Pay</i>	AM, EM, LIDC	Financial Sector
WEO, October 2014, Chapter 3, <i>Is It Time for an Infrastructure Push? The Macroeconomic Effects of Public Investment</i>	AM, EM	Infrastructure
AFR REO, April 2015, Chapter 2, <i>How Can Sub-Saharan Africa Harness the Demographic Dividend?</i>	Sub-Saharan Africa	Demographics
AFR REO, April 2015, Chapter 3, <i>Global Value Chains: Where are You? The Missing Link in Sub-Saharan Africa's Trade Integration</i>	Sub-Saharan Africa	Trade; integration
AFR REO, October 2014, Chapter 2, <i>Building Resilience in Fragile States in Sub-Saharan Africa</i>	Sub-Saharan Africa	Large-scale reforms
AFR REO, October 2014, Chapter 3, <i>Addressing the Infrastructure Deficit in Sub-Saharan Africa</i>	Sub-Saharan Africa	Infrastructure
AFR REO, April 2014, Chapter 2, <i>Fostering Durable and Inclusive Growth</i>	Sub-Saharan Africa	Large-scale reforms
AFR REO, May 2013, Chapter 4, <i>Reforming Energy Subsidies</i>	Sub-Saharan Africa	Energy subsidies
AFR REO, October 2012, Chapter 3, <i>Structural Transformation in Sub-Saharan Africa</i>	Sub-Saharan Africa	Large-scale reforms
APD REO, April 2015 Chapter 2, <i>Reaping the Benefits from Global Value Chains</i>	Asia	Trade
EUR Regional Economic Issues Special Report, October 2014, <i>25 Years of Transition Post-Communist Europe and the IMF</i>	EUR	Structural reforms; economic transition
EUR, Central and Eastern Europe: New Member States Policy Forum 2014, Selected Issues Paper, <i>Making the Most of the EU Single Market</i>	EUR	Trade integration
EUR Regional Economic Issues, October 2013, <i>Faster, Higher, Stronger—Raising the Growth Potential of CESEE</i>	EUR	Labor market
MCD REO 2014, Annex 2, <i>Public Infrastructure Investment in the MENAP and CCA Region</i>	MCD	Infrastructure
MCD REO 2014, Annex 3, <i>Access to Finance for Small and Medium-sized Enterprises in the MENAP and CCA</i>	MCD	Financial inclusion
MCD REO 2014, Annex 4, <i>Measuring Inclusiveness in the MENAP and CCA Region</i>	MCD	Inclusiveness
MCD REO 2014, Annex 5, <i>Economic Cooperation and Integration in the CCA</i>	CCA	Trade; integration
MCD REO 2012, Annex 3.1, <i>Measuring the Informal Economy in the Caucasus and Central Asia</i>	CCA	Inclusiveness
WHD REO, 2014, Chapter 5, <i>Long-Run Growth in Latin America and the Caribbean: The Role of Economic Diversification and Complexity</i>	Latin American and Caribbean	Trade

<b>Table D. Bilateral Surveillance-related Products on Macrostructural Issues</b>	
<b>Reference/Title</b>	<b>Reform or Policy Issue</b>
Algeria, 2014 Article IV, Selected Issues Paper, <i>Designing a Fiscal Framework for Algeria</i>	Fiscal framework
Algeria, 2014 Article IV, Selected Issues Paper, <i>Fostering Export Diversification in Algeria</i>	Export diversification
Algeria, 2014 Article IV, Selected Issues Paper, <i>Fostering Private Sector Job Creation in Algeria</i>	Jobs and growth
Algeria, 2014 Article IV, Selected Issues Paper, <i>Price Competitiveness in Algeria</i>	Competitiveness
Angola, 2014 Article IV, Selected Issues Paper, <i>Inclusive Growth</i>	Inclusive growth
Azerbaijan, 2013 Article IV, Selected Issues Paper, <i>Revamping the Fiscal Policy Framework in Azerbaijan</i>	Fiscal framework
Barbados, 2015 Article IV, Selected Issues Paper, <i>On the Adoption of Fiscal Rules</i>	Fiscal rule
Belgium, 2012 Article IV, Selected Issues Paper, <i>Towards Job-Creating Labor Market Reform</i>	Labor market
Belize, 2014 Article IV, Selected Issues Paper, <i>Toward a Fiscally Sustainable Wage Negotiation Framework</i>	Wage framework
Belize, 2008 Article IV, Selected Issues Paper, <i>Management of Oil Revenues</i>	Oil revenues management
Belize, 2006 Article IV, Selected Issues Paper, <i>The Impact of EU Trade Preference Erosion on Belize</i>	Trade
Bolivia, 2013 Article IV, Selected Issues Paper, <i>A Medium-term Fiscal Framework to Manage Resource Wealth in Bolivia</i>	Fiscal rule; resource wealth management
Botswana, 2014 Article IV, Selected Issues Paper, <i>Fiscal Policy Implications for Labor Market Outcomes in Middle-Income Countries</i>	Labor market
Botswana, 2014 Article IV, Selected Issues Paper, <i>Sustaining Growth and Enhancing Economic Diversification in Botswana</i>	Economic diversification
Brazil, 2015 Article IV, Selected Issues Paper, <i>Filling the Gap: Infrastructure Investment in Brazil</i>	Infrastructure
Burkina Faso, 2014 Article IV, Selected Issues Paper, <i>An Overview of the Cotton Sector</i>	Cotton sector; structural transformation
Burkina Faso, 2014 Article IV, Selected Issues Paper, <i>Inclusive Growth</i>	Inclusive growth
Burkina Faso, 2014 Article IV, Selected Issues Paper, <i>Mining Sector and Considerations for a Fiscal Rule</i>	Mining sector; fiscal rule
Egypt, 2014 Article IV, Selected Issues Paper, <i>Policies to Promote Growth and Create Jobs Over the Next Decade</i>	Growth; labor market
El Salvador, 2014 Article IV, Selected Issues Paper, <i>Assessing Potential Output</i>	Productivity; labor market
El Salvador, 2014 Article IV, Selected Issues Paper, <i>Fostering Diversification and Integration</i>	Export diversification
El Salvador, 2014 Article IV, Selected Issues Paper, <i>Investment Drivers in Central America: An Application to El Salvador</i>	Investment
Euro Area, 2015 Article IV, Selected Issues Paper, <i>Euro Area Structural Reform Governance</i>	Governance
Euro Area, 2015 Article IV, Selected Issues Paper, <i>Policy Options for Tackling Non-Performing Loans in the Euro Area</i>	Insolvency reform/NPL resolution
Euro Area, 2014 Article IV, Selected Issues Paper, <i>External Rebalancing in the Euro Area: Developments and Policies</i>	Product market; labor market
France, 2014 Article IV, Selected Issues Paper, <i>France in the Global Value Chains: Revisiting the Competitiveness Loss</i>	Trade
France, 2013 Article IV, Selected Issues Paper, <i>Potential GDP Estimates for France: Prudent (and Calling for Action)</i>	Structural reforms; potential growth

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<b>Table D. Bilateral Surveillance-related Products on Macrostructural Issues (cont.)</b>	
<b>Reference/Title</b>	<b>Reference/Title</b>
Germany, 2015 Article IV, Selected Issues Paper, <i>Women in the Labor Market and the Demographic Challenge</i>	Labor market; gender
Greece, 2013 Article IV, Selected Issues Paper, <i>Restoring Growth</i>	Product market; labor market
Guinea-Bissau, 2015 Article IV, Selected Issues Paper, <i>Economic Diversification</i>	Export diversification; product market
Guinea-Bissau, 2015 Article IV, Selected Issues Paper, <i>Financial Stability, Inclusion and Deepening</i>	Financial inclusion
Haiti, 2015 Article IV, Selected Issues Paper, <i>Opportunities and Challenges for Growth</i>	Large-Scale reforms
Haiti, 2015 Article IV, Selected Issues Paper, <i>Explaining the ECF's Fiscal Target</i>	Fiscal structural reforms
Haiti, 2015 Article IV, Selected Issues Paper, <i>Public Expenditure in Haiti</i>	Fiscal structural reforms
India, 2015 Article IV, Selected Issues Paper, <i>Price and Income Elasticity of Indian Exports: The Role of Structural Rigidities</i>	Infrastructure; trade
India, 2014 Article IV Selected Issues Paper, <i>Macroeconomic Effects of Labor and Product Market Deregulation in India</i>	Labor market
India, 2015 Article IV, Selected Issues Paper, <i>Financial Inclusion and Access in India: Analysis Using a Structural Model</i>	Financial inclusion
Indonesia, 2013 Article IV, Appendix 6, <i>Indonesia—Labor Market Policies and Economic Growth</i>	Labor market
Iran 2014, Article IV, Selected Issues Paper, <i>An Application of Unemployment in Iran using MCD Unemployment Template</i>	Jobs
Iran, 2014 Article IV, Selected Issues Paper, <i>Targeted Subsidy Reform in Iran</i>	Subsidies and equity
Italy, 2015 Article IV, Selected Issues Paper, <i>Does Public Sector Inefficiency Constrain Firm Productivity: Evidence from Italian Province</i>	Fiscal structural reform, productivity
Italy, 2015 Article IV, Selected Issues Paper, <i>Resolving Non-Performing Loans in Italy: A Comprehensive Approach</i>	Insolvency reform/NPL resolution
Italy, 2015 Article IV, Selected Issues Paper, <i>The Italian and Spanish Corporate Sectors in the Aftermath of the Crisis</i>	Corporate solvency
Italy, 2014 Article IV, Selected Issues Paper, <i>Judicial Reforms for Growth</i>	Judicial reform, growth
Jordan 2014, Article IV, Selected Issues Paper, <i>Electricity Tariff Increases--Impact on Competitiveness</i>	Competitiveness
Jordan, 2014 Article IV, Selected Issues Paper, <i>A Generation in Waiting—Unlocking the Employment Potential of Jordan's Population</i>	Jobs and growth
Kazakhstan, 2014 Article IV, Selected Issues Paper, <i>Assessment of Inclusive Growth</i>	Inclusive growth
Kuwait, 2014 Article IV, Selected Issues Paper, <i>Small and Medium Term Enterprises: Pursuit of Growth and Diversification in Kuwait</i>	Growth; diversification
Kuwait, 2013 Article IV, Selected Issues Paper, <i>In Pursuit of Diversification, Private Sector Development and Job Creation</i>	Jobs and growth; economic diversification
Kuwait, 2013 Article IV, Selected Issues Paper, <i>Optimal Fiscal Policy for Kuwait: How much to save and how much to invest</i>	Fiscal structural reforms
Lebanon, 2014 Article IV, Selected Issues Paper, <i>An Application of the MCD Unemployment Template</i>	Jobs
Lebanon, 2014 Article IV, Selected Issues Paper, <i>Designing a Fiscal Framework for a Prospective Commodity Producer: Options for Lebanon</i>	Fiscal framework
Libya, 2013 Article IV, Selected Issues Paper, <i>A Note on Subsidy Reform in Libya</i>	Energy subsidies; equity
Luxembourg, 2014 Article IV, Selected Issues Paper, <i>External Developments, Competitiveness, and Labor Market Policies</i>	Labor market; external competitiveness

<b>Table D. Bilateral Surveillance-related Products on Macrostructural Issues (cont.)</b>	
<b>Reference/Title</b>	<b>Reference/Title</b>
Madagascar, 2015 Article IV, Selected Issues Paper, <i>Financial System in Madagascar - Structure Performance and Risks</i>	Financial sector
Mauritania, 2015 Article IV Report, <i>Growth, Employment and Socio-demographic Challenges in Mauritania, Structural Reforms and Economic Diversification For More Inclusive Growth in Mauritania</i>	Labor market; economic diversification; inclusive growth
Mauritania, 2015 Article IV, Selected Issues Paper, <i>Growth, Employment and Socio-Demographic Challenges in Mauritania</i>	Jobs and growth
Mauritania, 2015 Article IV, Selected Issues Paper, <i>Managing Resource Wealth in Mauritania: Considerations for a Fiscal Framework</i>	Fiscal framework
Mauritania, 2015 Article IV, Selected Issues Paper, <i>Structural Reforms and Economic Diversification for More Inclusive Growth</i>	Inclusive growth; economic diversification
Mexico, 2014 Article IV, Selected Issues Paper, <i>The Impact of Mexico's Energy Reform on Hydrocarbons Production</i>	Energy sector
Mexico, 2013 Article IV, Selected Issues Paper, <i>Mexico—Reforms to the Fiscal Framework</i>	Fiscal framework
Morocco, 2013 Article IV, Selected Issues Paper, <i>Fuel Subsidies in Morocco: International Experience and Possible Ways Forward</i>	Fuel subsidies
Morocco, 2013 Article IV, Selected Issues Paper, <i>Inclusive Growth in Morocco: Stylized Facts and Policies</i>	Inclusive growth
Namibia, 2014 Article IV, Selected Issues Paper, <i>Policies That can Raise Potential Growth in Small Middle-Income Countries of SSA</i>	Potential growth; economic transformation
Netherlands, 2014 Article IV, Selected Issues Paper, <i>SME Financing in the Netherlands</i>	SME profitability and funding
Nicaragua, 2015 Article IV, Selected Issues Paper, <i>Lifting a Constraint on Growth: Achievements and Challenges of Nicaragua's Electricity Sector</i>	Energy sector
Nicaragua, 2015 Article IV, Selected Issues Paper, <i>Raising Potential Output: The Challenge of Inclusive Growth</i>	Potential growth; inclusive growth
Palau, 2014 Article IV, Selected Issues Paper, <i>Promoting Tourism and Growth in Palau</i>	Economic diversification
Peru, 2015 Article IV, Selected Issues Paper, <i>Investment Dynamics in Peru</i>	Growth
Peru, 2013 Article IV, Selected Issues Paper, <i>Fiscal Framework Alternatives for a Resource Rich Country</i>	Fiscal framework
Peru, 2013 Article IV, Selected Issues Paper, <i>The Spillover Effects of China's Slowdown and Rebalancing on Peru</i>	External
Peru, 2012 Article IV, Selected Issues Paper, <i>Trade Evolution and Policy Challenges</i>	Trade
Peru, 2011 Article IV, Selected Issues Paper, <i>Advances and Challenges in Social Policies</i>	Social policies
Philippines, 2015 Article IV, Selected Issues Paper, <i>Capital Market Development in the Philippines: Boosting Investment and Growth</i>	Capital market development
Philippines, 2015 Article IV, Selected Issues Paper, <i>Improving Infrastructure in the Philippines</i>	Infrastructure
Philippines, 2014 Article IV, Selected Issues Paper, <i>Financial Inclusion in the Philippines</i>	Financial inclusion
Philippines, 2014 Article IV, Selected Issues Paper, <i>The Philippines Employment Challenges</i>	Labor market
Poland, 2015 Article IV, Selected Issues Paper, <i>Raising Productivity Growth in Poland: The Role of Structural Transformation</i>	Labor market; structural transformation

## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE

<b>Table D. Bilateral Surveillance-related Products on Macrostructural Issues (cont.)</b>	
<b>Reference/Title</b>	<b>Reference/Title</b>
Portugal, 2015 Article IV, Selected Issues Paper, <i>Creating Jobs for Lower-Skilled Workers</i>	Labor market
Portugal, 2015 Article IV, Selected Issues Paper, <i>Structural Reforms to Boost External Competitiveness</i>	Large-scale reforms
Portugal, 2015 Article IV, Selected Issues Paper, <i>Supporting Medium-Term Growth Through Debt Restructuring: Progress, Impediments and Remaining Challenges</i>	Insolvency reform/NPL resolution
Portugal, 2015 Article IV, Selected Issues paper, <i>Taking Stock of Structural Reforms, A Firm Level Perspective</i>	Large-scale reforms
Portugal, 2013 Article IV, Selected Issues Paper, <i>How Fast Can Portugal Grow</i>	Large-scale reforms
Portugal, 2013 Article IV, Selected Issues Paper, <i>Portugal's Competitiveness</i>	Large-scale reforms
Qatar, 2015 Article IV, Selected Issues Paper, <i>Breaking Down Qatar's Rapid Growth: Input Growth or Productivity or Both?</i>	Growth
Qatar, 2015 Article IV, Selected Issues Paper, <i>Strengthening Fiscal Policy and Fiscal Framework in Qatar</i>	Fiscal framework
Qatar, 2014 Article IV, Selected Issues Paper, <i>Assessing Efficiency of Qatar Public Investment</i>	Fiscal framework
Romania, 2015 Article IV, Selected Issues Paper, <i>Benefits of Boosting Quality Public Infrastructure Spending in Romania</i>	Infrastructure
Romania, 2015 Article IV, Selected Issues Paper, <i>Romanian State-Owned Enterprises: Challenges and Reform Priorities</i>	State-owned enterprise; energy and transport sector
Saudi Arabia, 2013 Selected Issues Paper, <i>Labor Market Policies for Addressing Saudi Unemployment</i>	Labor market
Senegal 2014 Article IV, Selected Issues Paper and African Departmental Paper, <i>Growth, Structural Transformation, and Export Diversification</i>	Export diversification; product market
Senegal, 2014 Article IV, Selected Issues Paper and African Departmental Paper, <i>Social Safety Nets in Senegal</i>	Fiscal structural reforms; labor market
Slovenia, 2014 Article IV, Selected Issues Paper, <i>Legal and Institutional Challenges in Corporate Insolvency</i>	Insolvency reform/NPL resolution
South Africa, 2014 Article IV, Selected Issues Paper, <i>South Africa's External Adjustment: Any Role for Structural Factors?</i>	Structural factors; exports
Spain 2015 Article IV, Selected Issues Paper, <i>Recent Labor Market Reforms: A Preliminary Assessment</i>	Labor market
Spain, 2015 Article IV, Selected Issues Paper, <i>Obstacles to Firm Growth in Spain</i>	Small firms growth; productivity
Spain, 2015 Article IV, Selected Issues Paper, <i>Spain's Insolvency Regime: Reforms and Impact</i>	Insolvency reform/NPL resolution
Spain, 2014 Article IV, Selected Issues Paper, <i>Tackling the Corporate Debt Overhang in Spain</i>	Insolvency reform/NPL resolution
Spain, 2014 Article IV, Selected Issues Paper, <i>What is Spain's Sustainable Growth Rate?</i>	Potential output
Spain, 2013 Article IV, Selected Issues Paper, <i>Does Spain's Insolvency Framework Need Further Reforms to Address Debt Distress in the Non-Financial Private Sector?</i>	Insolvency reform/NPL resolution
Spain, 2015 Article IV, Selected Issues Paper, <i>Potential Output in France, Germany, and Spain: A Re-Assessment</i>	Potential output
Sudan 2012, Article IV, Selected Issues Paper, <i>Fiscal Cost and Distributional Impact of Fuel Subsidies</i>	Subsidies and equity
Sudan 2012, Article IV, Selected Issues Paper, <i>Fiscal Decentralization: Trends, Challenges and Perspectives</i>	Fiscal structural reforms

**Table D. Bilateral Surveillance-related Products on Macrostructural Issues (concluded)**

Reference/Title	Reference/Title
Sudan, 2012 Article IV, Selected Issues Paper, <i>Growth and Employment in Sudan</i>	Growth; employment
Suriname, 2014 Article IV, Selected Issues Paper, <i>Fostering Sustainability and Inclusive Growth in Suriname</i>	Inclusive growth
Suriname, 2013 Article IV, Selected Issues Paper. <i>The Labor Market in Suriname</i>	Labor market
Suriname, 2013, Article IV, Selected Issue Paper. <i>Fiscal Sustainability and Natural Resource Wealth for Suriname</i>	Fiscal sustainability; resource wealth
Tanzania, 2014 Article IV, Annex I, <i>Economic Diversification and Growth: Tanzania Experience</i>	Economic diversification
Thailand, 2015 Article IV, Appendix IX. <i>Thailand's Demographic Challenge</i>	Demographics
United Arab Emirates, 2014 Article IV, Selected Issues Paper, <i>The Efficiency of Public Spending</i>	Public spending efficiency
United States, 2013 Article IV, Selected Issues Paper, <i>Risky Business: The Uncertainty in U.S. Health Care Spending</i>	Health care
United States, 2012 Article IV, Selected Issues Paper, <i>International Spillovers from US Corporate Tax Reform</i>	Tax Policy
WAEMU, 2015 Article IV, Selected Issues Paper, <i>Financial Inclusion in the WAEMU</i>	Financial Inclusion
WAEMU, 2015 Article IV, Selected Issues Paper, <i>Growth, Structural Transformational and Diversification in the WAEMU</i>	Structural transformation; export diversification; product market; demographics
WAEMU, 2015 Article IV, Selected Issues Paper, <i>Trade and Revenue Implications of ECOWAS Common External Tariff on WAEMU Member States</i>	Trade
West Bank and Gaza, 2013, Selected Issues Paper, <i>Growth in the Palestinian Economy</i>	Growth
West Bank and Gaza, 2013, Selected Issues Paper, <i>The Link between Growth, Employment and Unemployment in West Bank and in Gaza</i>	Jobs and growth
Yemen, 2013 Article IV, Appendix II, <i>Unemployment, Poverty and Human Development Indicators in Yemen</i>	Jobs; poverty reduction
Yemen, 2013 Article IV, Appendix III, <i>Fiscal Policy and Structural Reforms in Yemen</i>	Fiscal structural reforms
Zambia, 2015 Article IV, Selected Issues Paper, <i>Enhancing Financial Inclusion in Zambia</i>	Financial inclusion
Zambia, 2015 Article IV, Selected Issues Paper, <i>Toward More Inclusive Growth</i>	Economic diversification; infrastructure; labor market
Zambia, 2013 Article IV, Appendix V, <i>Lending Rate Ceilings and Their Impact on the Nonbanking Sector</i>	Financial sector
Zambia, 2012 Article IV, Annex V, <i>Challenges to Financial Services in Zambia</i>	Financial sector; financial inclusion

## Annex II. Defining and Measuring Structural Reforms

The priority for this paper is to focus on reform indicators that cover a sufficiently large sample across all income groups to ensure that the analysis in this paper is sufficiently representative of the entire Fund membership. However, structural reforms are inherently difficult to measure because they often involve policies or conditions that cannot be easily quantified, particularly compared to the measurability of many macroeconomic policies. In this regard, it is important to acknowledge data constraints—both in availability, measurement, and coverage—that limit the scope for quantitative analysis of structural reforms.

While more exhaustive and granular indicators are more readily available for advanced economies, and in particular types of reforms, this underscores the importance of efforts underway to address data gaps, including by the Fund. Nevertheless, there have been a number of efforts to develop indicators that facilitate cross-country empirical analysis of structural reform, including work done by the IMF (2008) as well as other international organizations.

The database used for the analysis in this paper covers 108 countries—33 advanced markets (AMs), 53 emerging markets (EMs), and 22 low-income developing countries (LIDCs)—during the period 1970-2011. It includes data for 10 types of structural reforms compiled from a wide array of sources such as the Economist Intelligence Unit, Fraser Institute, IMF, and Organisation for Economic Cooperation and Development (OECD). The reform areas covered include financial sector reforms, trade liberalization, institutional reforms, as well as a range of reforms related to the functioning and regulation of markets. Following are the descriptions of the specific reform variables:

### Financial Sector Reforms

**Banking System Reform:** The banking sector reform index is a composite of five sub-indices on: (i) interest rate controls, such as floors or ceilings; (ii) credit controls, such as directed credit, and subsidized lending; (iii) restrictions on bank competition, such as limits on branches and barriers to entering the banking sector, including licensing requirements or limits on foreign banks; (iv) the degree of state ownership; and (v) the quality of banking supervision and regulation, including power of independence of bank supervisors, adoption of a Basel I capital adequacy ratio, and framework for bank inspections. Each of these sub-indices is aggregated with equal weights. *Source:* Prati et al. 2012 "Which reforms work and under what institutional environment? Evidence from a new dataset on structural reform", Abiad and others (2008).

**Capital Market Development:** The index refers to policies that either regulate or encourage the development of securities markets, including the auctioning of government securities, establishing debt and equity markets, policies to encourage the development of bond and equity markets, and on the openness of the domestic stock market to foreigner investors. *Source:* Abiad, Abdul, Enrica Detragiache, and Thierry Tressel, "A New Database of Financial Reforms," IMF Working Paper WP/08/266, December 2008.

## Trade Reform

**Trade Liberalization:** This index reflects average tariff rates, with missing values extrapolated using implicit weighted tariff rates. It is measured on a scale of 0 to 1, where zero means tariff rates are 60 percent or higher and 1 means tariff rates are zero. *Source:* Prati et al. 2012 "Which reforms work and under what institutional environment? Evidence from a new dataset on structural reform."

## Institutional Reform

**Legal System and Property Rights:** This index gauges the legal protections afforded individuals and property, and thus a legal system consistent with economic freedom in terms of the rule of law, security of property rights, an independent and unbiased judiciary, and an impartial court system. The index is assembled by EFW-Fraser Institute from three primary sources: the PRS Group's *International Country Risk Guide*, the World Economic Forum's *Global Competitiveness Report*, and the World Bank's *Doing Business* project and Worldwide Governance Indicators. *Source:* EFW-Fraser Institute Database, 1975–2012.

## Market Regulation and Function

**Agriculture:** This index aims to capture the extent of government intervention in the market for the main agricultural export commodity in each country. Each country-year pair is assigned one of four degrees of intervention: (i) maximum (public monopoly or monopsony in production, transportation, or marketing); (ii) high (administered prices); (iii) moderate (public ownership in relevant producers, concession requirements); and (iv) no intervention. *Source:* Prati et al. 2012 "Which reforms work and under what institutional environment? Evidence from a new dataset on structural reform"; IMF Index of Agricultural regulation.

### Business regulation:

- *Promotion of competition:* This is a qualitative indicator which looks at government policies on actively promoting competition and curbing unfair business practices. It is scored on a 1-5 scale as follows: (1) very poor-no effective competition institutions or legislation; (2) poor-competition policy and legislation exist; little enforcement action; (3) fair-some sanctions to curb monopoly power; reduction of entry restrictions; (4) good-significant actions to reduce monopoly power and promote competition; (5) very good-unrestricted entry to almost all markets. Effective enforcement of well-drafted competition policy. *Source:* Economist Intelligence Unit.
- *Policy environment for foreign investment:* This index scores countries between 1 and 10 on a variety of measures, including government policy towards foreign investment, investment protection schemes, and the risk of expropriation, with 1 being the worst and 10 the best. *Source:* Economist Intelligence Unit.

**Labor Market Reforms:**

- *Hiring and firing regulations:* This index is based on an Executive Opinion Survey conducted by the World Economic Forum, which asks whether the hiring and firing of workers in a country is impeded by regulations (=1) or flexibly determined by employers (=7). *Source:* World Economic Forum, Global Competitiveness Report.
- *Collective bargaining:* This index is based on an Executive Opinion Survey conducted by the World Economic Forum, which asks whether wages in a country are generally set by a centralized bargaining process (=1) or up to each individual company (=7). *Source:* World Economic Forum, Global Competitiveness Report.

**Regulation in energy, transport and communications (ETCR):** This index summarizes regulatory provisions in seven sectors: telecoms, electricity, gas, post, rail, air passenger transport, and road freight. In this regard, regulations pertain to factors such as market entry, public ownership, vertical integration, and market structure. *Source:* OECD.

**Infrastructure**

**Infrastructure:** While to date there is no established index that appropriately captures infrastructure reform, here we use public capital—the principal input into the production of public infrastructure—that is most commonly used in Fund and academic analysis. The PPP-adjusted (\$2005) public capital stock is measured as the accumulated value of public investment over time, adjusted for depreciation which varies by income group and over time. *Source:* Fiscal Monitor.

**Innovation**

**R&D Expenditure:** Current and capital expenditures (both public and private) on creative work undertaken to increase stock of knowledge, expressed as percent of GDP. *Source:* Economist Intelligence Unit.

## Annex III. Empirical Approach & Results

### I. Panel Regression Analysis

The regression analysis proceeds in three steps:

- **Step 1 – We estimate the relationship between different types of reform and productivity growth (Table 1, main text).** A separate panel regression equation is estimated for each country group using a sample of 108 countries—33 AMs, 53 EMs and 22 LIDCs—from 1970 to 2011.

$$\Delta \log(TFP_{i,t}) = \beta_0 + \beta_1 \log(TFP_{i,t-1}) + \beta_2 X_{i,t-1} + \mu_t + \nu_i + \varepsilon_{i,t} \quad (1)$$

$\Delta TFP_{i,t}$  denotes Total Factor Productivity (TFP) growth in country  $i$  at year  $t$ . Regressions are estimated using annual data.  $X_{i,t-1}$  is a one-year lag of each reform indicator. Various reform indices are considered one at a time (see definitions in Annex II). The equation controls for time effects  $\mu_t$  to capture common time trends, i.e. oil price shocks, and time-invariant country effects  $\nu_i$ , i.e. historical and legal origins.

- **Step 2 – We calculate and compare the productivity payoffs of different reforms within each country group (Table 3, main text).** As the correlation across reform indices does not allow for including all reforms simultaneously in the regression, we compare the yield from each reform by comparing the TFP growth impact of moving from the 25<sup>th</sup> percentile in each country group to the top performer or “frontier” in each group. We multiply the coefficient estimates of each reform,  $\beta_2$  with the distance to the top performer in that reform category.

$$TFP \text{ growth impact} = \beta_2 * \text{distance} ; \text{ where } \text{distance} = \overline{\text{reform}_{\text{top-performer}}} - \text{reform}_{i(25\text{thpercentile})} \quad (2)$$

- **Step 3 – We provide a relative ranking of the reforms with the highest productivity payoffs within each group.**

Tables 1 and 3 present the results of the Step 1 and 2 above, respectively. Results in Table 1 capture the differential effect of a certain type of reform on TFP growth. For example, the coefficient estimate on Infrastructure in EMs implies that a one standard deviation improvement in the index raises annual TFP growth in EMs by about 0.4 percentage points. As the high co-movement of reforms do not allow for using several reforms simultaneously in the regression, the estimates for each index obtained in Table 1 can be compared across country groups, but not across reform indices. To overcome this issue we multiply the regression coefficient estimate in Table 1 with the “room for reform” for countries in the group. Results in Table 3 capture the change in TFP growth from an improvement in an index from the 25<sup>th</sup> percentile to the top of the index for the given country group. For example, such an improvement in the infrastructure index for the EM group results in 3.8 percentage points increase in annual TFP growth. Some coefficient estimates (especially for AMs) drop out because countries have already reached the “frontier” of a reform index and therefore the reform gap is zero.

## II. Robustness of Panel Regression Analysis

We check the robustness of the baseline panel regression results along several dimensions. These include: (a) using longer lags of reforms indices (2 or 3 years); (b) including additional control variables—economy-wide level of education, institutional capacity, and terms of trade; (c) lagged dummy variable for systemic banking crises (Laeven and Valencia; 2012); and (d) using the sub-sample ranging from 1990–2011. We also examine the impacts of reforms on output and investment growth. The robustness results are summarized in Table A1. In the case of longer lags, most of the baseline results remain broadly unchanged up to a lag of 3 years. In the regressions with additional control variables, the coefficients for reform indices remain robust to the inclusion of measures of education and institutional capacity, and to a lesser extent the terms of trade.<sup>1</sup> The inclusion of lagged systemic banking crisis did not affect the baseline results, nor did the use of the 1990–2011 sub-sample data. We further conducted a joint test of coefficient equality between country groups that confirms that the baseline estimates are indeed statistically different from each other (at 1 percent significance level).

**Table A1: Robustness Check Results:  
Alternative Control Variables**

REFORMS	AM	EM	LIDC
<b>Financial Sector Reform</b>			
Banking system reform	C, D	A, B, C, D	A, B, C, D
Interest controls			A, C, D
Credit controls	B, C, D	B, C, D	A, B, C, D
Privatization		A, B, C, D	C, D
Supervision	A, C, D	A, B, C, D	A, B, C, D
Capital market development	A, C, D	B, C, D	B, C, D
<b>Trade Liberalization</b>			
Tariff rates (average)			A, B, C, D
<b>Institutional Reform</b>			
Legal system and property rights		A, B, C, D	B, C, D
<b>Infrastructure</b>			
Public capital stock	A, B, C, D	A, B, C, D	B, C, D
<b>Market Deregulation</b>			
Agriculture			B, C, D
Policy environment for foreign investment	A, B, C, D		
Promotion of competition		A, B, C, D	
Hiring and firing regulations	A, B, C, D	A, C, D	
Collective bargaining	A, B, C, D	B, C, D	
Energy/Transport/Communications	B, C, D		
<b>Innovation</b>			
R&D Spending	A, B, C, D		

Note: Robustness checks are based on the baseline only (see Table 1). Letters indicate significance of 15 percent or less when using (A) longer lags of reform indices; (B) additional control variables - education, institutional capacity, terms of trade; (C) systemic banking crisis dummy; and (D) a sub-sample over

Source: IMF staff estimates.

<sup>1</sup> The robustness check is conducted by adding one control variable at a time to the baseline equation. When the 3 control variables are added together, the results for regulation reform indices and banking system reform in AMs disappear.

Table A2 shows the results from our baseline specification, when using output and real investment growth as alternative dependent variables. The structure of the panel regression on the right-hand side remains the same as the baseline, except that we replace the lagged TFP level with the lagged GDP level. The results indicate significant and positive effects on real output growth for most reform types, particularly in EMs and LIDCs. Of the reform types, we found that financial sector reforms had universal significant impacts on output growth across all country groups. The results using investment growth, however, are weaker. Notably, reforms aimed at improving policy environment for foreign investment in AMs, and legal system/property rights and labor market regulations in EMs, were associated with positive and significant growth in investment.

Table A3 considers robustness to the baseline results presented in Table 3 (main text) by assessing the long-run (steady-state) TFP impact across different types of reforms in each

income group. The impact of a large reform is now assessed by multiplying the long-term marginal effect obtained by the composite coefficient estimate  $-\beta_2/\beta_1$  in the baseline specification (1) by the gap between the top performer and the bottom 25<sup>th</sup> percentile in each reform index. It is shown that reform priorities within each country group (AMs, EMs, LIDCs) are broadly similar to the baseline, with most of the top priority reforms remaining important by both short-run and long-run measures (reforms with unchanged relative priorities are indicated with a “\*”). A few notable exceptions—where reforms may have higher (“+”) or lower (“-”) impacts over the longer term—are as follows:

**Table A2: Robustness Check Results:  
Alternative Outcome Variables**

REFORMS	AM	EM	LIDC
<b>Financial Sector Reform</b>			
Banking system reform	Y	Y	Y
Interest controls			Y, K
Credit controls	Y	Y	Y
Privatization		Y	Y
Supervision	Y	Y, K	Y
Capital market development	Y	Y, K	Y
<b>Trade Liberalization</b>			
Tariff rates (average)			Y
<b>Institutional Reform</b>			
Legal system and property rights		Y, K	Y
<b>Infrastructure</b>			
Public capital stock			Y
<b>Market Deregulation</b>			
Agriculture			Y
Policy environment for foreign investment	Y, K		
Promotion of competition			
Hiring and firing regulations	Y	Y, K	
Collective bargaining		Y, K	
Energy/Transport/Communications			
<b>Innovation</b>			
R&D Spending			

Note: “Y” and “K” indicate significance of 15 percent or less when using output and real investment growth as the dependent variable, respectively.

Source: IMF staff estimates.

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- For AMs and EMs, the size of the long-term TFP level effect associated with loosening of hiring and firing regulations does not stand out among other reform types, unlike its short-term TFP growth effect.
- On the other hand, decentralizing the collective bargaining process and improving the quality of banking supervision become more important for EMs in terms of the long-term level effect.
- For LIDCs, developing the capital market has a relatively moderate short-term growth effect, but its long-term level gain ranks among the highest across reforms.
- For all country groups, infrastructure investment generates the highest long-term TFP level gain across major reform areas.<sup>2</sup>

**Table A3: Long-term Productivity Gains from Different Types of Structural Reform**

REFORMS	AMs	EMs	LIDCs
<b>Financial Sector Reform</b>			
Banking system reform	*	*	*
Interest controls			*
Credit controls		*	*
Privatization		*	+
Supervision	*	*	*
Capital market development		*	+
<b>Trade Liberalization</b>			
Tariff rates (average)			*
<b>Institutional Reform</b>			
Legal system and property rights		*	*
<b>Infrastructure</b>			
Public capital stock	*	*	*
<b>Market Deregulation</b>			
Agriculture			-
Policy environment for foreign investment	*		
Promotion of competition		*	
Hiring and firing regulations	-	-	
Collective bargaining	*	*	
Energy/Transport/Communications	*		
<b>Innovation</b>			
R&D Spending	*		

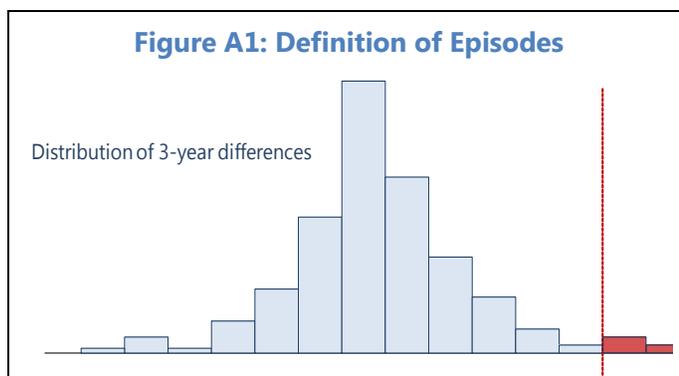
Note: The symbols indicate the change in the relative priority of reforms within each country group: "\*" indicates same relative priority both in the short and the long term; "+" indicates higher relative priority in the long term than the short term; "-" indicates lower relative priority in the long term than the short term.

Source: IMF staff estimates.

<sup>2</sup> The interpretation of the long-run results warrants some caution as the concept of a *steady-state impact* of reform on level TFP becomes less clear in the context of our estimation approach, which assumes that the potential impact of reforms on countries' macro outcomes inherently depends on their level of development (AM, EM, LIDC).

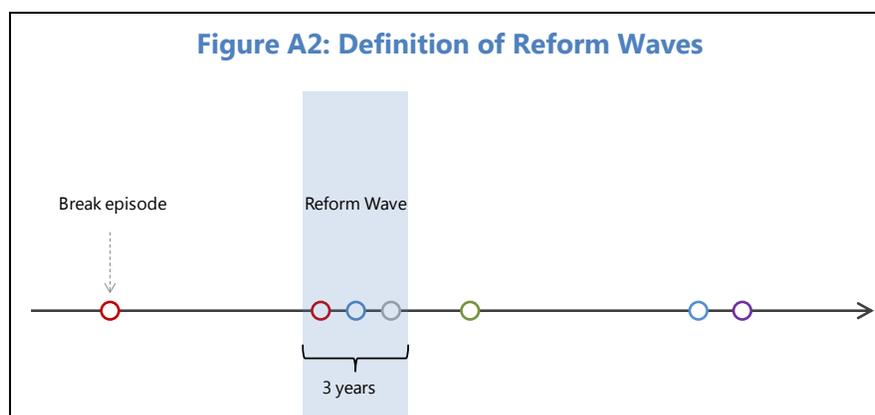
### III. Episodes Analysis

In this exercise, we first identify, for each reform variable, break points in time that lead to large and sustained improvements in a country (“reform episodes”). The time trends of these breaks, including the frequency and the composition of reform types both at the global and the country group level, are presented in Section III.B. The approach we adopt is a straightforward one, which essentially involves comparing, over a fixed window, the pre- and the post-break average TFP growth rates. It therefore establishes, as in the case of the regression analysis, association and not causation. The data (countries, reform variables) used are identical to the one from the regression analysis.



Specifically, we identify breaks using an intuitive heuristic method. Specifically, for each country  $i$ , we first calculate the 3-year differences of a reform variable  $X$  as follows:  $\Delta X_3^i = X_{t+3}^i - X_t^i$ . We then pool together these 3-year differences across the entire sample countries—AMs, EMs, and LIDCs—to form a single distribution for  $X$ . We define *breaks, or reform episodes*, as those that satisfy the following criteria: (a) the observation belongs to the top 3 percentile of the distribution (Figure A1); (b) the annual change over the 3 years following the observation is always positive; and (c) if there are two or more consecutive observations that meet (a) and (b), we pick the first observation as the break. These rules imply that, by construction, breaks would occur at most every 3 years in a country for each reform variable.

To examine the impacts of these multiple, simultaneous reforms, we define a “reform wave” as an incidence of 3 or more breaks in different areas over a 3-year period.



## STRUCTURAL REFORMS AND MACROECONOMIC PERFORMANCE

According to this definition, we identify a total of 34 reform waves—5 AMs, 23 EMs, and 6 LIDCs. These 34 reform waves accounted for 103 individual breaks—15 AMs, 70 EMs, and 18 LIDCs—or about 16 percent of the total 644 breaks identified from the break analysis.

Figure A3: Summary of Reform Waves

Country Name	Year	Banking	Capital Markets	Tariff	Legal System	Infrastructure	Agriculture	Policy Environment	Promotion of Competition	Hiring and Firing	Collective Bargaining	ETCR	R&D
Argentina	1988	1	1	1									
Bolivia	1988	1	1		1								
Brazil	1985	1	1	1									
Bulgaria	1995	1						1	1				
Cameroon	1993	1	1				1						
Chile	1974	1	1	1									
Chile	1984		1	1								1	
Colombia	1987	1	1	1									
Colombia	2000								1	1	1		
Czech Republic	1995							1	1		1		
Dominican Republic	2002				1					1	1		
Ecuador	1988	1	1	1						1	1		
Egypt	1999			1						1	1		
El Salvador	1988	1	1		1								
Estonia	1992	1	1									1	
Guatemala	1988	1	1		1								
Guatemala	2000				1					1	1		
Honduras	2001				1					1	1		
Hungary	1993	1	1									1	
Indonesia	1982	1	1	1									
Indonesia	2000				1								
Indonesia	2002								1	1	1		
Indonesia	2002								1	1	1		
Israel	2001								1	1	1	1	
Korea	2001				1					1			1
Madagascar	1986	1	1				1						
Nigeria	2002			1	1						1		
Peru	1986	1		1		1							
Peru	1989		1		1		1						
Poland	1995							1			1	1	
Slovakia	1999								1	1		1	
Sri Lanka	1989		1		1		1						
Uganda	1989	1			1		1						
Venezuela	1974		1		1	1							
Venezuela	1987	1	1	1									

#### IV. Robustness of Episodes Analysis

This Annex describes several robustness exercises that were implemented to examine how well the baseline “episodes” analysis holds.

The baseline results broadly hold under different distribution thresholds. Applying 1 and 5 percent cut-off values results in total breaks of 227 and 984, respectively, roughly proportionate to the number of breaks from the baseline 3 percent threshold. Despite the substantial difference in the number of breaks, however, we found the positive correlation between reform breaks and productivity growth to hold across country groups and reform types with only a few exceptions. Furthermore, in many cases, the breaks that belong to the top 1 percent of the distribution—i.e. those with larger structural improvements—are associated with higher subsequent productivity growth increases.

Using different time windows to calculate post-break productivity gains leads to similar results. Specifically, we conducted tests with symmetric windows of 3, 4, 6 years around breaks, as well as an asymmetric window of 3-year pre-break and 5-year post-break. Notwithstanding a few exceptions, we find that the results from these tests are broadly consistent with the baseline, albeit at varying degrees depending on country groups and reform types.

Outliers among identified breaks also do not seem to matter much. To check this, we compare the 5-year *median* annual TFP growth rates before and after breaks (based on the 3 percent threshold), instead of averages. The baseline results still broadly hold in this case, except for financial sector supervision and collective bargaining for AMs and interest controls for LIDCs.

Finally, for relevant reforms, we find that about a half of our baseline breaks coincide with those identified using a standard statistical approach. We used as the method of reference, a modified version of Bai and Perron (1998, 2002) developed by Berg et al (2012) for small sample data. A break point identified using our heuristic approach “coincides” with one from the statistical method if the latter takes place within one year before or after the former. Based on this criterion, about 60, 40, and 50 percent of our baseline breaks coincide with those from the Berg et al (2012) method.

## Annex IV. Survey Methodology & Results

Staff conducted an online survey of IMF country mission chiefs in July 2015 to help gain insights into the macro-relevant structural reform needs of member countries.

### Survey Questions

- 1. The survey included several basic questions regarding country characteristics to facilitate analysis.** Mission chiefs were asked to specify each country's: region (e.g. Africa, Europe, etc.); income classification (advanced, emerging, or low-income); and other country characteristics (e.g., fragile state, small state, commodity exporter, etc.).
- 2. The survey also sought MCs' views on the macroeconomic importance of structural reforms.** The questions focused on 11 broad reform categories (plus scope to indicate other reform needs or priorities),<sup>1</sup> with MCs asked to indicate:
  - i. The extent to which each reform category is important for the country's macroeconomic performance;<sup>2</sup> and
  - ii. The top three structural reform priorities for the country's macroeconomic performance.

### Response Rate

- 3. Response rates were similar across income levels and regions, providing a representative assessment of the needs and views across the Fund's membership.** The overall response rate was around 60 percent, with rates ranging from 54 to 63 percent across income groups, and from 53 to 66 percent across regions.

Category of Countries	Number of Surveys Sent	Responses	
		Number	Rate
<b>Income Group:</b>			
<i>Advanced Economies</i>	35	19	54
<i>Emerging Markets</i>	87	55	63
<i>Low-Income Countries</i>	66	38	58
<b>Region:</b>			
<i>Africa</i>	45	24	53
<i>Asia and the Pacific</i>	35	21	60
<i>Europe</i>	43	26	60
<i>Middle East and Central Asia</i>	30	18	60
<i>Western Hemisphere</i>	35	23	66
<b>Overall</b>	<b>188</b>	<b>112</b>	<b>60</b>

<sup>1</sup> The reform categories included: banking sector; other financial and capital market, trade liberalization, legal system and property rights, infrastructure, agricultural, business regulations, labor market, industry regulations, technology and innovation, fiscal, and other reforms. The first 10 categories broadly parallel the reform indices used elsewhere in this paper (see Annex II), although survey responses may reflect somewhat different interpretations of these reforms.

<sup>2</sup> Four possible answers: to a great extent (weighted with a scoring of 3); to some extent (2); to a limited extent (1); and not at all/not applicable (0).

# The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence.

Olivier Blanchard      Justin Wolfers \*

March 25, 1999

Figure 1 shows the evolution of unemployment in Europe since 1960. The figure plots average unemployment rates over 5-year intervals, starting in 1960, both for the OECD–Europe as a whole (the line) and for 15 individual OECD–Europe countries.<sup>1</sup> It shows the increase in the overall unemployment rate, from 1.7% in the early 1960s to 11.0% in the mid 1990s, together with the large dispersion in unemployment rates across countries, from 4.0% in Switzerland to more than 20% in Spain in the mid 1990s.

Explanations for these evolutions fall into three classes.

- Explanations that focus on the role of adverse economic shocks. Adverse shocks can indeed affect the natural rate; some of them may have permanent effects. And there are many plausible candidates for such shocks over the last 30 years. As unemployment started rising in the 1970s, the focus was on oil price increases and the TFP growth slowdown. Since then, the evolution of the real interest rate, and other shifts in labor demand have been added to the list.

Explanations based solely on shocks run however into a major empirical problem. Shocks can potentially explain the general increase in unemployment over time. But, as we shall see, they do not differ enough across countries to explain the cross-country variation so evident in Figure 1.

- Explanations that focus on the role of adverse labor market institutions. Most labor market institutions affect the nature of unemployment, and some can indeed potentially generate a high natural rate.

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\*MIT and NBER, and Harvard. Harry Johnson lecture, April 1999. Preliminary. We thank Steve Nickell, Ed Lazear, John Addison and the OECD for data.

<sup>1</sup>The 8 time periods are 1960–1964 to 1990–1994, and 1995+ (typically 1995–1996.) The 15 countries included in OECD–Europe are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Left out are Greece, Iceland and Luxembourg, for which we could not construct time series for all the explanatory variables used later in the paper.



With the persistence of high unemployment, explanations based on adverse institutions (“labor market rigidities”) have become steadily more popular. But explanations based solely on institutions also run into a major empirical problem: Many of these institutions were already present when unemployment was low (and similar across countries), and, while many became more employment-unfriendly in the 1970s, the movement since then has been largely in the opposite direction. Thus, while labor market institutions can potentially explain cross country differences today, they do not appear able to explain the general evolution of unemployment over time.

- Explanations that focus on the interaction of adverse shocks with adverse market institutions. In one form or another, these explanations all rely on the idea that the effects of a given shock on unemployment may be larger or longer lasting, depending on the specific labor market institutions. For example, the modern rendition of hysteresis theories goes like this: If labor market institutions lead to a labor market with lower flows and higher unemployment duration, the risk is higher that adverse shocks lead some workers to become disenfranchised, reducing the pressure of unemployment on wages, and slowing down the return to lower unemployment.

It is easy to see what makes this last class of explanations attractive. It has at least the potential to explain not only the increase in unemployment over time (through shocks), but also the heterogeneity of unemployment evolutions (through the interaction of the shocks with different labor market institutions).

In a companion paper ([2]), we took stock of the underlying alternative theories. We looked at whether and how different shocks, and different institutions, may affect equilibrium unemployment. We looked at the channels through which shocks and institutions might interact. This led us to argue in favor of the third class of explanations. In this paper, we look at the aggregate empirical evidence more formally, at the role of shocks, institutions, and interactions, in accounting for the evolution of European unemployment.

To do so, we look at the data through two panel data specifications. In the first, we assume unobservable but common shocks across countries. In the second, we construct and use country-specific time series for a number of shocks. In both specifications, we allow for an interaction between shocks and institutions: The effect of a given shock on unemployment is allowed to depend on the set of labor market institutions of the country.

We see the results as surprisingly (at least given our priors) good: Specifications that allow for shocks, institutions, and interactions can account both for much of the rise and much of the heterogeneity in the evolution of unemployment in Europe. The magnitude of the effects of the shocks on unemployment are plausible. The magnitude of the effects of institutions are equally so. And their interactions can explain much of the difference across countries.

These results notwithstanding, four caveats are in order. First, the results

are preliminary. In many cases, we do not have time series for institutions, and the series we have may not be very good. Second, the results are typically weaker when we allow for time-varying rather than time-invariant measures for institutions. Third, while the time dimension of the panel is too short to learn much about dynamics (we aggregate time in five-year intervals, and thus have at most 8 time observations), the dynamic effects of the observable shocks do not reflect the long run neutrality—or near long run neutrality—properties suggested by the theory. Last, the fact that the specifications fit the data does not prove that the (rather loosely specified) theories are right; just that they are not obviously inconsistent with the data.

We believe we are the first to analyze the panel data evidence looking simultaneously at shocks, institutions and interactions. But we build on a large number of previous studies. [3] were among the first to emphasize both shocks and institutions in the initial rise in unemployment. An empirical attempt to explain U.K unemployment as a result of shocks, institutions, and interactions was presented by [4] in their book on unemployment. Two recent studies are by [9] and by [7]. We differ mostly from Phelps by allowing for institutions, and for interactions. We differ mostly from Nickell by allowing for observable shocks, and by having a panel data dimension. Our results are partly consistent with those of Phelps with respect to shocks, and largely consistent with those of Nickell with respect to institutions.

## 1 The shocks

Three shocks appear to have played an important role in the increase in European unemployment. (This short declarative sentence conveys more certainty than is justified. Caveats follow.)

### The decline in TFP growth

Starting in the early 1970s, Europe suffered a large decrease in the underlying rate of total factor productivity (TFP) growth. This is shown in Figure 2. The two lines in Figure 2a give the evolution of the average rate of TFP growth for the 15 countries of OECD–Europe (E15 in what follows) and for the 5 largest European countries, France, Germany, Italy, Spain, and the United Kingdom (E5). To give a sense of the heterogeneity across countries, Figure 2b gives the evolution of TFP growth in each of the E5 countries. (Showing all 15 countries would clutter the figure but yield similar conclusions).<sup>2</sup> TFP growth which ran at close to 5% in the 1960s decreased to 3% in the first half of the 1970s,

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<sup>2</sup>Details of construction and sources are given in the appendix. First, we construct the rate of TFP growth for each year and each country by computing the Solow residual for the business sector, and then dividing it by the labor share. Under the assumption of Harrod neutral technological progress—the assumption that allows for steady state growth—this is the right measure of technological progress, and gives the rate at which the economy can grow along the balanced growth path. We then take averages for each 5-year period. Finally, E5 and E15 are simple (unweighted) averages of TFP growth over countries.

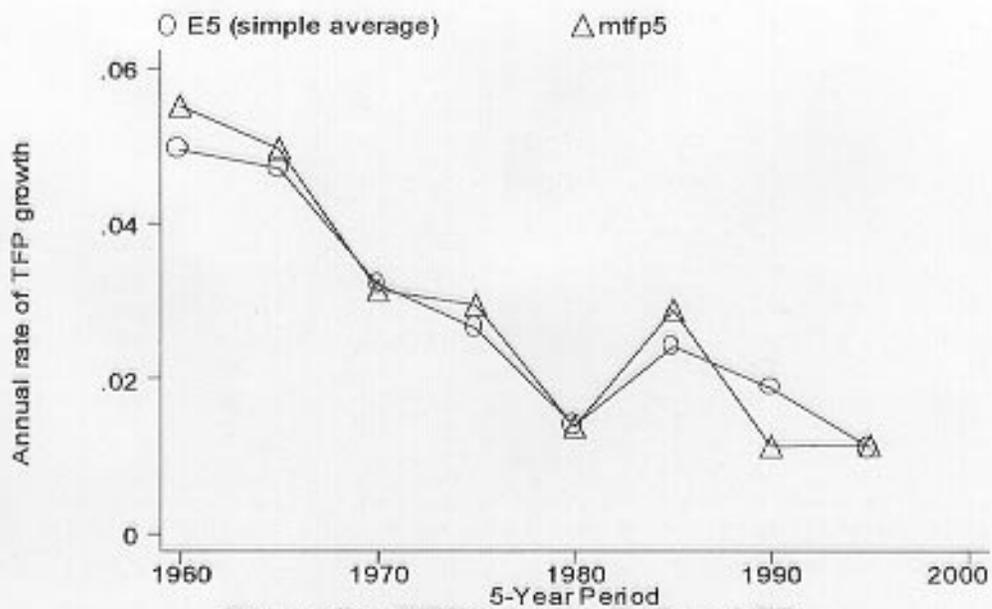


Figure 2a. TFP growth, E15 and E5

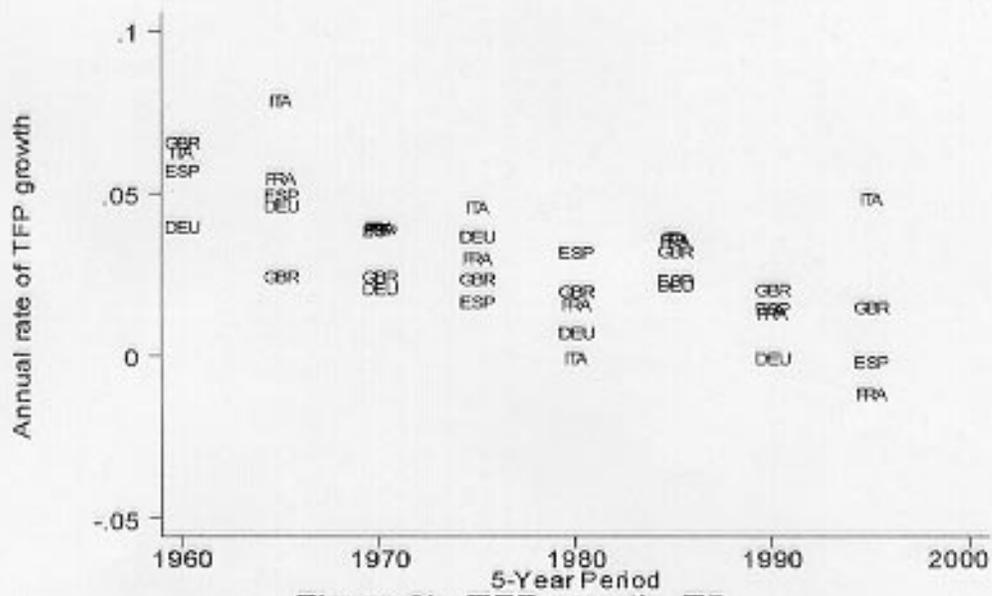


Figure 2b. TFP growth, E5

and to 2% in the second half of the 1970s. It has remained around 2% since then. The decline has affected countries in roughly similar fashion.<sup>3</sup>

This decrease in TFP growth was initially partially hidden by the large increase in the relative price of oil and other raw materials. Thus, much of the focus of the initial research (for example [3]) was on this increase in relative prices rather than on the slowdown in TFP growth. In retrospect, the slowdown in TFP growth was surely the more important shock.

There is no question that a slowdown in TFP growth can lead to higher equilibrium unemployment for some time. All that is needed is that it takes some time for workers and firms to adjust expectations to the new lower underlying rate, leading to wage growth in excess of productivity growth for some time. Can the effects of such a slowdown on unemployment be permanent? Theory suggests that the answer, to a first approximation, is no. Once expectations have adjusted, the effect on unemployment should mostly go away.<sup>4</sup> There lies the first puzzle of European unemployment. The initial shock is clearly identified. But, after more than twenty years, it is hard to believe that its effects are not largely gone. So, what accounts for today's high unemployment? There is much less agreement here, but two other shocks appear relevant.

### The real interest rate

Figure 3a gives the evolution of the average real interest rate for both the E15 and the E5. Figure 3b gives the real interest rate for each of the E5 countries.<sup>5</sup>

Figure 3 shows that, both for the E15 and the E5 countries, the real rate turned from positive in the 1960s to sharply negative in the second half of the 1970s, and then to large and positive in the 1980s and the 1990s. For some countries, the decline in the 1970s was nearly as dramatic as the ensuing increase. Figure 3b shows how the real rate in Spain went down from 2% in the 1960s to -5% in the mid 1970s, back to 5% in the 1980s and the 1990s. For others, such as Germany, the real rate has remained much more stable.

Why might such changes in the real interest rate affect the equilibrium unemployment rate? Because they are likely to affect capital accumulation, and at a given wage (and thus a given ratio of employment to capital), to shift labor demand.<sup>6</sup> Are the effects on unemployment likely to be permanent? Theory is largely agnostic here. Again, a plausible answer is that long run effects, if present, are likely to be small.

<sup>3</sup>Note that, in contrast to the other observations which are based on five yearly observations, the observation for 1995 is typically based on only one (1995) or two (1995 and 1996) years. Thus, one year can make a lot of difference. This is the case for Italy in this figure.

<sup>4</sup>We shall use the existence of the companion paper as an excuse for keeping our discussion of theoretical issues, and of relevant references, to a minimum.

<sup>5</sup>First, we compute the real interest rate for each year and each country as the nominal long rate on government bonds minus a five-year average of lagged inflation. We then take averages for each 5-year period. E15 and E5 are computed as simple (unweighted) averages across countries.

<sup>6</sup>This is not the only channel, but we believe it is the main one. For more discussion, see the companion paper.

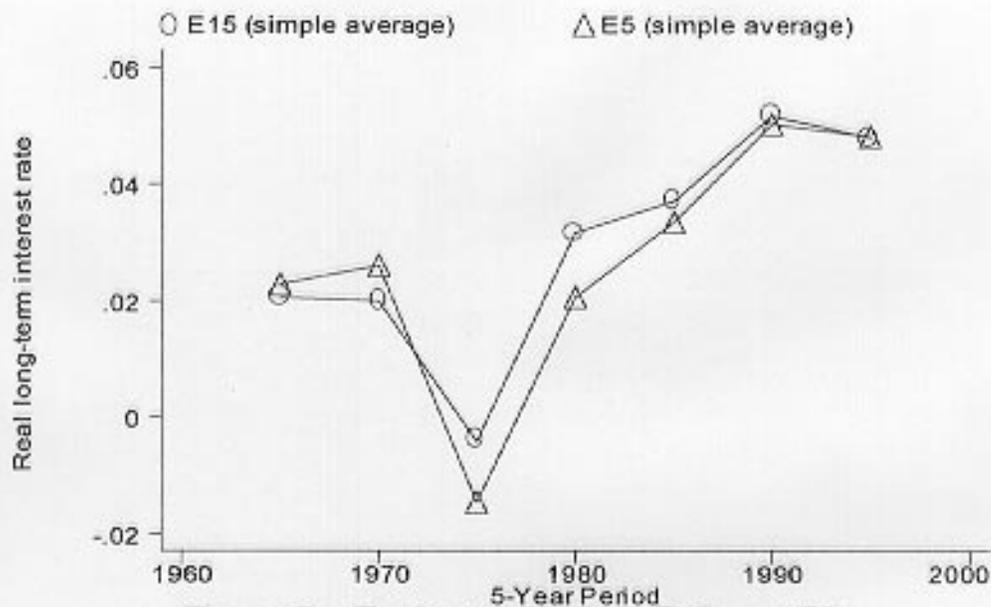


Figure 3a. Real interest rate, E15 and E5

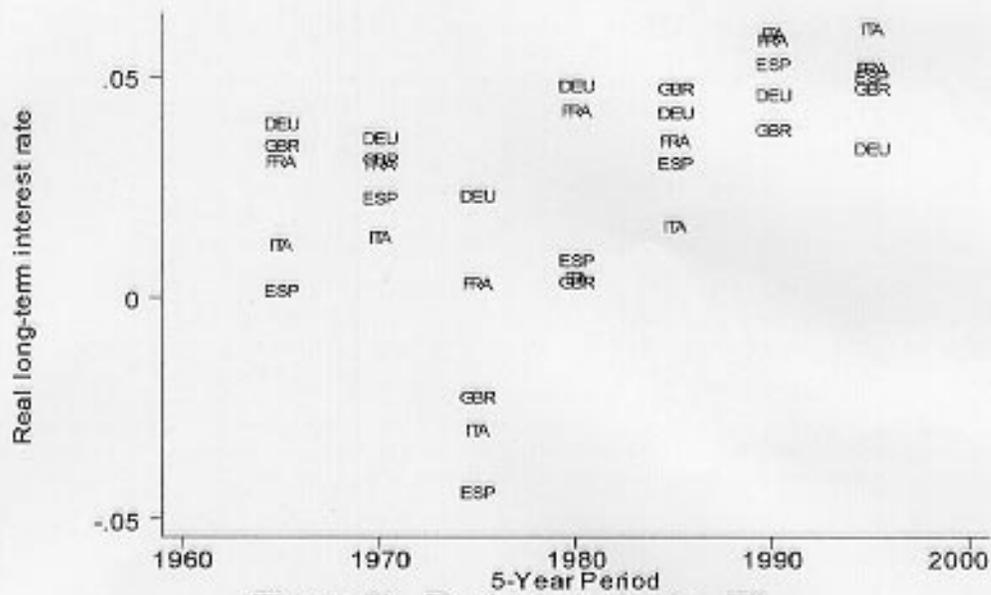


Figure 3b. Real interest rate, E5

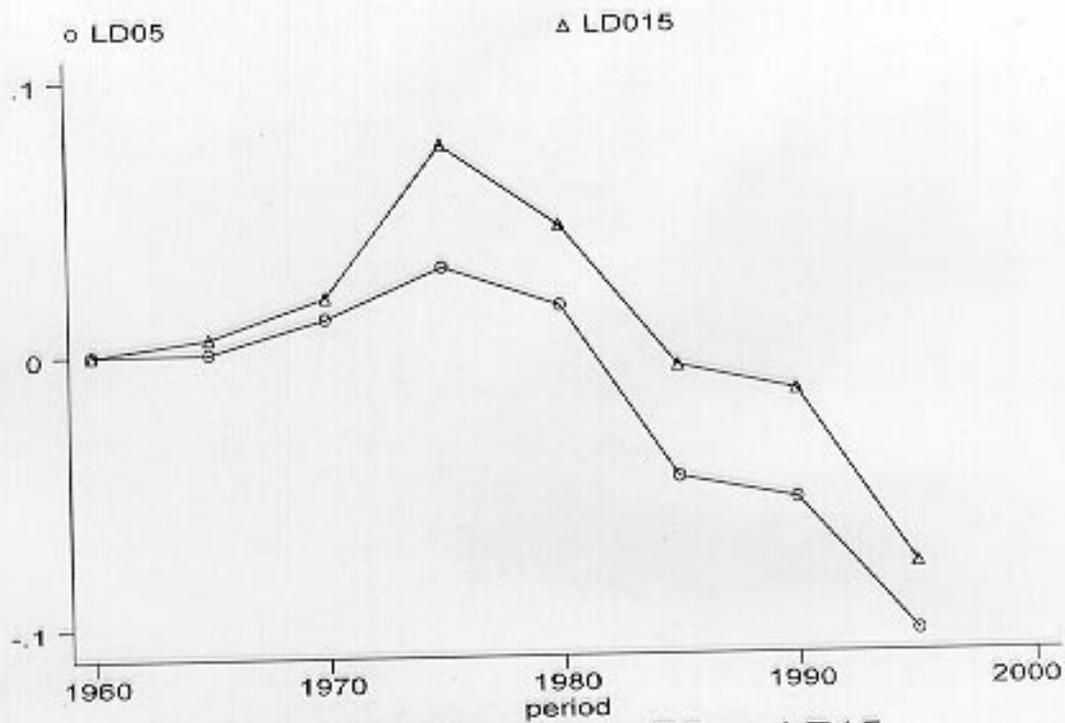


Figure 4. Log labor share, E5 and E15

It is clear from Figure 3 that the pattern of interest rates may help explain why unemployment kept increasing in the 1980s, even as the effects of lower TFP growth on unemployment were—presumably—declining. This suggests that, had real interest rates been stable, unemployment would have been higher in the 1970s, and lower in the 1980s. Put another way, the low real interest rates of the 1970s delayed some of the increase in unemployment by a decade or so. The higher real interest rates since the early 1980s may help explain why unemployment has remained high in the 1980s and the 1990s.

### Shifts in labor demand

Figure 4 gives the evolution of the log of the labor share for both the E15 and the E5 (normalized to equal zero in 1960). For both groups of countries, the evolution of the share is quite striking. After increasing in the 1970s, the share started decreasing in 1980s and the decline has continued since then. For the E5, the labor share is now 10% lower than it was in 1960; for the E15, it is 8% lower.

Why look at the evolution of the labor share? Suppose that technology was characterized by a Cobb Douglas production function, both in the short and the long run. The decrease in the share since the 1980s would then reflect either technological bias away from labor—a decrease in the coefficient on labor in the production function— or a decrease in the wage relative to the marginal product of labor. In either case, the implication would be an adverse shift in labor demand.<sup>7</sup>

The elasticity of substitution may be equal to one in the long run, but it is surely less than one in the short run. In that case, movements in the share will also reflect the dynamic response of factor proportions to factor prices. Indeed, much of the increase in the labor share in the 1970s surely reflects the effects of the increase in the real wage relative to TFP growth together with a low short-run elasticity of substitution, and some of the decrease since then reflects the adjustment of proportions over time. In [1], we argued however that more has been at work than the adjustment of factor proportions to factor prices, and that the large decline in the share reflects a genuine adverse shift in labor demand.

We shall use the measure of the shift in labor demand constructed in that earlier paper; this measure can be thought as the log of the labor share, purged of the effects of factor prices on the share in the presence of a low elasticity of substitution in the short run. Figure 5a plots the evolution of this measure of the labor demand shift for both the E5 and the E15. Figure 5b plots the evolution of the measure for each of the E5 countries. Both figures show how the adjustment eliminates much of the increase and subsequent unwinding in

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<sup>7</sup>Let  $Y = N^\alpha K^{1-\alpha}$ . Let the ratio of the wage to the marginal product of labor  $w/Y_n \equiv \mu$ .  $\mu$  is equal to 1 under perfect competition in both goods and labor markets, but may differ from 1 otherwise. Then the share of labor  $\alpha = a\mu$ . A decrease in  $\alpha$  reflects a decrease in  $a$  or a decrease in  $\mu$ . Also labor demand can be written as  $\log N = \log Y - \log w + \log \alpha$ . A decrease in  $\log \alpha$  leads to an equal decrease in  $\log N$  given output and the wage. This is why we look at the log share.

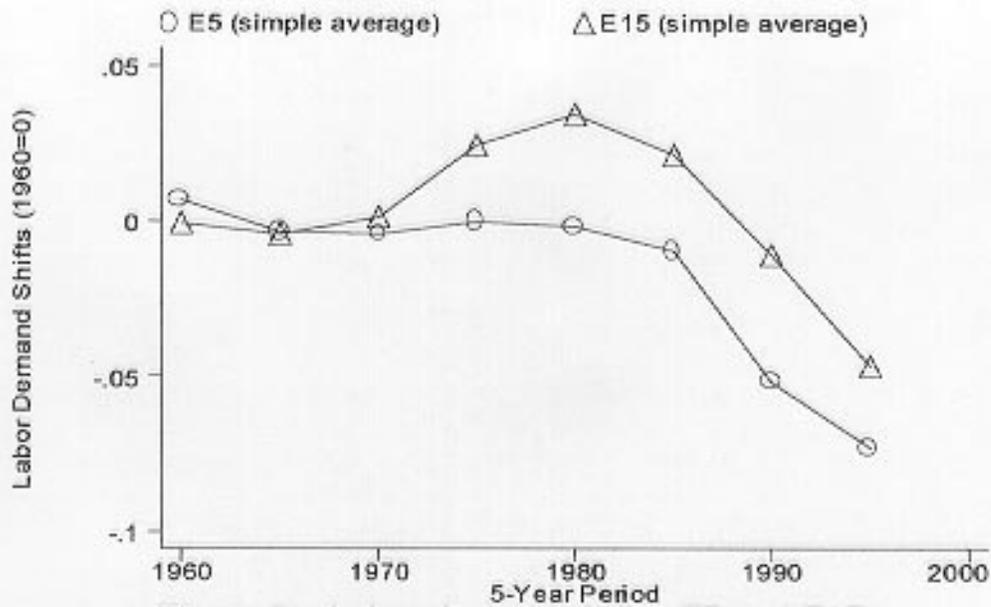


Figure 5a. Labor demand shifts, E5 and E15

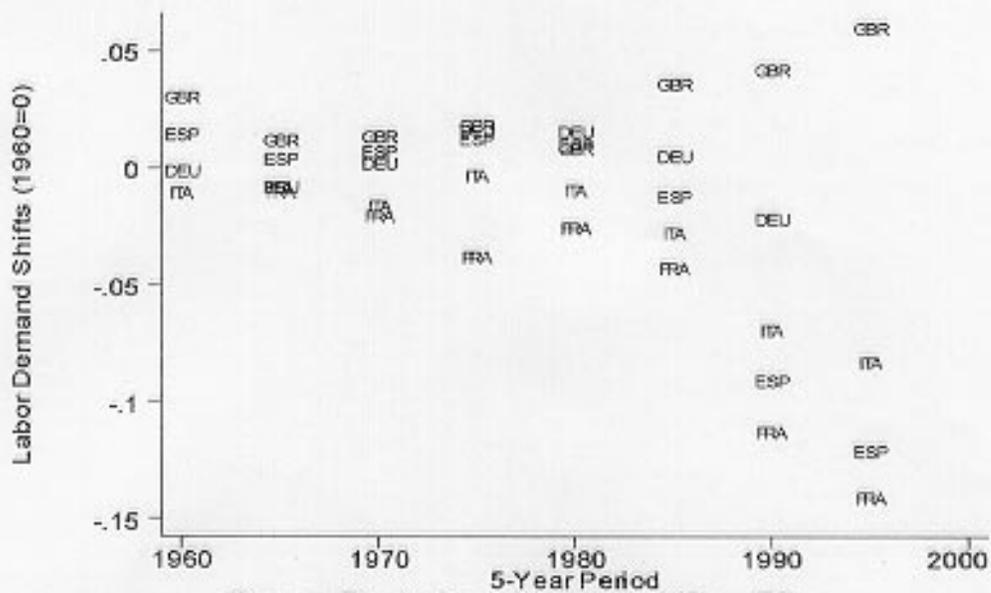


Figure 5b. Labor demand shifts, E5

the share in the 1970s (visible in Figure 4). Figure 5a shows little movement in the measure until the mid 1980s, with a strong decrease thereafter. Figure 5b shows the sharp difference between the UK where, if anything the shift has been positive (the underlying labor share has remained roughly constant) and countries such as Spain or France (where the adverse shift has exceeded 10%).<sup>8</sup>

Such an adverse shift in labor demand can clearly lead to higher equilibrium unemployment for some time. Its dynamic effects however are quite different from those of the two shocks we looked at earlier. Think for example of the shift as coming from a decrease in labor hoarding by firms—one of the interpretations suggested in [1]. As firms get rid of redundant workers, the result will be a decrease in employment, and so an increase in unemployment. Thus, such a shift has the potential to explain why unemployment has remained high in many countries in the 1990s. But the decrease in labor hoarding also leads to higher profit, which in turn should lead, over time, to capital accumulation and higher employment. This is a relevant point to keep in mind when we think about the future. If it is the case that such a shift is indeed responsible for some of the unemployment of the 1990s, then this suggests a brighter future, as the favorable effects start dominating and lead to an increase in employment over time.

#### **Equilibrium versus actual unemployment**

We have focused so far on factors that affect equilibrium unemployment. There is no question however that part of the evolution of unemployment in Europe comes from the deviation of actual unemployment from equilibrium unemployment.

In environments of low to medium inflation, the change in inflation is likely to be a good signal of where equilibrium unemployment is relative to actual unemployment. Decreasing inflation is likely to reflect an unemployment rate above the equilibrium rate; increasing inflation reflects the reverse. Figure 6a shows the evolution of the change in inflation for the E5 and the E15. Figure 6b shows the evolution of the change in inflation for each of the E5.<sup>9</sup> The change in inflation was positive in the 1970s, suggesting an actual unemployment rate below the equilibrium rate. The change in inflation has been negative since then, suggesting that the equilibrium rate has been lower than the actual rate. In other words, macroeconomic policy probably delayed some of the increase in unemployment from the 1970s to the 1980s. And, as inflation is still slowly declining, actual unemployment probably exceeds equilibrium unemployment at this point. By how much is difficult to say: the relation between the change in inflation and the deviation of unemployment from its equilibrium may well be different at very low inflation.

Two caveats are in order as we end this section. First, what we have taken as

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<sup>8</sup>This distinction between Anglo-Saxon and Continental countries was one of the issues taken up in [1].

<sup>9</sup>First, we construct the change in inflation (using the business sector GDP deflator) for each year and each country. We then take the average for each 5-year period. The variables for E5 and E15 are simple (unweighted) averages.

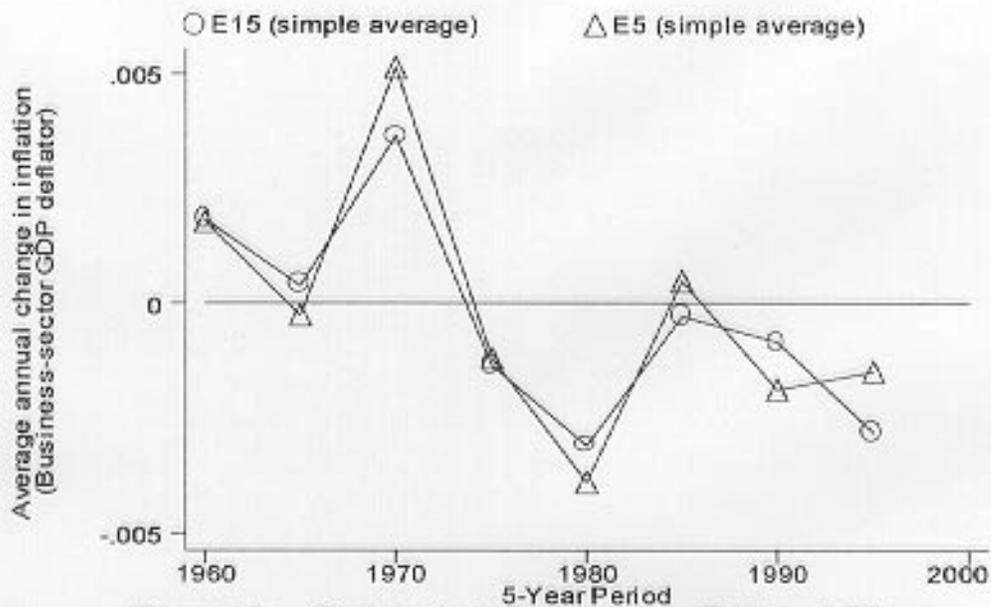


Figure 6a. Change in inflation rate, E15 and E5

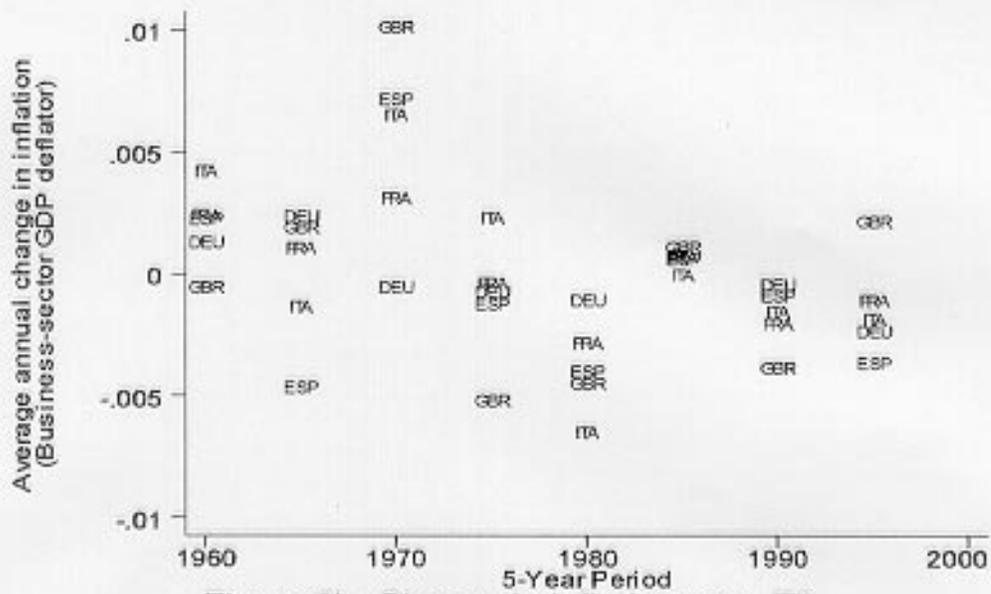


Figure 6b. Change in inflation rate, E5

“shocks” are at best proximate causes, and should be traced to deeper causes. This is particularly clear for interest rates and labor demand shifts. Second, there may well be other shocks. The notion that economic turbulence has increased is attractive; the effects of changes in turbulence on unemployment are likely to depend on labor market institutions. But the evidence of increased turbulence—at least measured by various indexes of reallocation across sectors, skills or regions—is surprisingly weak. Shifts in relative labor demand for skilled and unskilled may also have played a role in the rise of aggregate unemployment; the evidence is still unclear on this as well.<sup>10</sup>

Yet, this section suggests the following story: Europe was hit with major adverse shocks in the 1970s, oil price increases, but also, and more importantly, a large slowdown in TFP growth. Unemployment increased, but the adverse impact was initially softened both by lower real interest rates and a macroeconomic policy leading to less of an increase in actual than in equilibrium unemployment. As the effect of the adverse shocks of the 1970s receded, higher interest rates and tight macroeconomic policy contributed to higher equilibrium and actual unemployment in the 1980s. Finally, adverse labor demand shifts can potentially account for why unemployment has remained high in the 1990s.

## 2 The institutions

While in the 1970s the discussion of the rise of unemployment focused primarily on shocks (oil prices, TFP growth slowdown, then later, tight money), the persistence of high unemployment for another two decades has led to a shift in focus from shocks to labor market institutions. Indeed, many discussions of European unemployment ignore shocks altogether, and focus exclusively on “labor market rigidities”. What typically follows is a long list of so called “rigidities,” from strong unions, to high payroll taxes, to minimum wages, to generous unemployment insurance, to high employment protection, and so on.

We have learned however from theory that things are more complicated. Some of the so-called rigidities may represent rough institutional corrections for other distortions in the labor market. Some institutions may be bad for productivity, for output, and for welfare, but may not lead to an increase in unemployment. A short summary of the large literature—a literature largely triggered by the rise in European unemployment—goes as follows:<sup>11</sup>

- Some labor market institutions increase the equilibrium unemployment rate. First among them is the unemployment insurance system. More generous insurance increases unemployment through two separate channels: The first, and the focus of most microeconomic empirical work, is

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<sup>10</sup>These issues are discussed at more length in our companion paper.

<sup>11</sup>A longer discussion is given in our companion paper. A very useful and wider ranging presentation of both theory and facts is given by [8] in their chapter for the forthcoming Handbook of Labor Economics. A primarily theoretical discussion is given by [6] in their chapter for the forthcoming Handbook of Macroeconomics.

lower search intensity. The second is the effect on the bargained wage at a given rate of unemployment.

The specifics of unemployment insurance matter, not only for the unemployment rate, but its composition. For a given overall level of generosity, more backloaded benefits (a longer period during which benefits are paid) lead to a larger proportion of long-term unemployed in the pool of unemployed. This aspect is relevant in thinking about interactions of shocks and unemployment insurance.

- Some labor market institutions change the nature of unemployment, but have an ambiguous effect on the equilibrium unemployment rate. Among them is employment protection. Employment protection both decreases the flows of workers through the labor market, and increases the duration of unemployment. This makes for a more stagnant labor market, with a higher proportion of long-term unemployed, again an aspect relevant to interactions of shocks and employment protection. But the effect of lower flows and higher duration on the natural rate itself is definitely ambiguous.
- Some labor market institutions may not have much effect either on the rate or the nature of unemployment. Their incidence may be mainly on the wage, not on unemployment. This is the case for many of the components of the so called “tax wedge.” To a first approximation, what matters here is how taxes affect the ratio of after-tax unemployment benefits to after-tax wages. Taxes which by their nature apply equally on the unemployed and the employed, such as consumption or income taxes, are likely to be roughly neutral. And, if the unemployment insurance system tries to achieve a stable relation of unemployment benefits to after-tax wages—a reasonable assumption—even payroll taxes may not matter very much.

Turning to the evidence, the two relevant questions are: How much do labor market institutions vary across countries? And how have they evolved over time? Thanks to work by the OECD and by a number of researchers, we have fairly good answers to the first question. Evidence on the second remains more limited.

For the state of the answers to the first question, we refer the reader to [7] and [8]. In much of what we do later, we shall use the data set for institutions put together by Nickell and described in those two papers. We limit ourselves to a few observations here.

To give a sense of the variations in measures of institutions both across countries and across measures, Figure 7 focuses on two institutions, unemployment insurance and employment protection. It plots four scatter diagrams. In each case, the unemployment rate for each country is the average unemployment rate for the period 1990-1994, roughly the period corresponding to the Nickell measures for institutions.

- The two diagrams on top show the relation of the unemployment rate to



two alternative measures of the replacement rate—the ratio of unemployment benefits to the wage).

The measure on the left is the average value over 1990-1994 of the OECD measure. The OECD has constructed such a measure for each country, every two years, going back to 1961. The measure is an unweighted average of the replacement rate for different categories of workers, different family situations, and different durations of unemployment. The measure on the right is from Nickell and Layard.

Together, the two figures suggest three conclusions: (1) There is substantial variation in the degree of unemployment insurance across countries. (2) The two measures give far from identical rankings (the  $R^2$  of a regression of the OECD measure on the Nickell measure is 0.69) (3) The bivariate relation of either of the two measures to the unemployment rate is weak.

- The bottom two diagrams do the same exercise for employment protection.

The figure on the left uses the OECD employment protection index for the late 1980s. The index is a weighted average of cardinal measures along four dimensions of employment protection—procedural inconvenience, severance and notice period, treatment of unfair dismissals, and regulation of fixed-term contracts and temporary employment. The figure on the right uses the Nickell measure, which is itself taken from the OECD Jobs Study, and is an average of a number of ordinal rankings by the OECD and other researchers. Roughly the same three conclusions apply: variation across countries, across the two measures, and a poor relation to unemployment.

Let's now turn to the second question, the evolution of institutions over time. The basic question is a simple one. Have European labor market institutions become steadily worse since the early 1970s; or do they in fact date back much further, to a time when unemployment was still low? The question is simple, but the answer is not.

Time series for at least part of the period and a subset of countries have been put together for some institutions—unionization, the tax wedge—by the OECD and other researchers.<sup>12</sup> We shall limit our discussion here to two institutions, unemployment insurance, and employment protection.

- Figure 8a gives the evolution of the OECD measure of the replacement rate, for each 5-year period, for each of the E5 countries. (Presenting it for the E15 leads to too crowded a picture, but the same conclusions.)

The figure shows different evolutions across the E5. In Germany, France, and the UK, the replacement rate was relatively high to start; it has increased a bit in France, decreased a bit in Germany, more so in the UK.

In Spain and Italy, the replacement rate was very low at the start. It

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<sup>12</sup>See for example the CEP LSE data base.

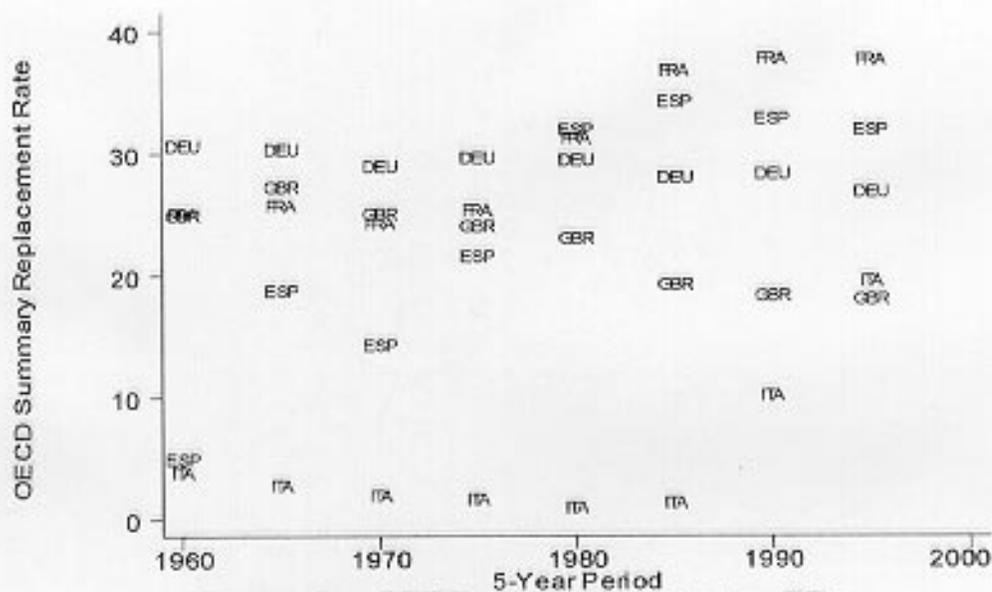


Figure 8a. OECD replacement rate, E5

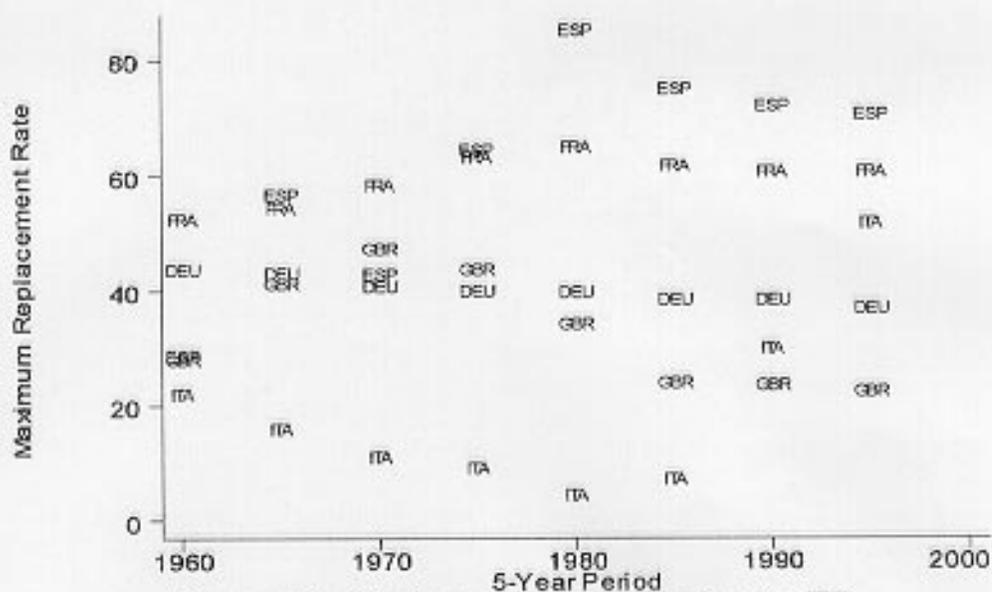


Figure 8b. Maximum replacement rate, E5

increased in the 1960s in Spain, and only more recently in Italy. Both are now at levels comparable to other countries. In short, there is no simple common answer.

The OECD measure is a summary measure of the replacement rate, and in some ways, not a very attractive one. It gives equal weight to the replacement rate in year 1, to the average replacement rate in years 2 and 3, and to the average replacement rate for years 4 and 5; but given the exit rate from unemployment, the generosity of benefits in years 4 and 5 for example is clearly less important for the determination of unemployment than the generosity of unemployment in year 1. Also, a system which gives 100% replacement to half of the workers and 0% to others will have very different effects from one that gives 50% replacement to all (i.e the effects are likely to be non linear), and so on. An indication of the relevance of this complexity is shown in Figure 8b. Figure 8b plots the maximum replacement rate over all categories and all durations of unemployment for each country and each subperiod. What clearly comes out is how this rate increased until the late 1970s, and how it has decreased since then. In other words, some of the excesses have been eliminated. This may be more important than changes in the average replacement rate.

- Putting together series on employment protection is difficult. We have taken a stab at it by constructing series based on published and unpublished data from the OECD, as well as on earlier work by [5]. Details are given in the appendix. There is a number of reasons why these series are at best rough approximations to the evolution of employment protection. In particular, the OECD data, which we use to construct the measures from 1985 on, are based on a much broader set of dimensions of employment protection than the Lazear series (notice period and severance pay for a blue collar worker with ten years seniority) which we use to construct the series before 1985.

This caveat notwithstanding, Figure 9 shows the evolution of the employment protection index for the E5 countries since 1960. (Again, the figure for the E15 would be harder to read, but yield similar conclusions). Note again the diversity of evolutions, and the lack of a simple answer.

Spain and Italy appear to have had high employment protection throughout. Employment protection in Spain was high under Franco, before unemployment increased.<sup>13</sup> In both countries, employment protection has decreased since the mid 1980s—in Spain, largely because of the development of fixed term contracts rather than the weakening of protection for workers on indefinite contracts. In France and Germany, employment protection was low to start with, then increased in the late 1960s and early 1970s, and has been stable since then.<sup>14</sup>

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<sup>13</sup>In Italy, de facto employment protection was exceptionally high in the early 1970s, something not reflected in the Lazear measure, and by implication not reflected in our measure.

<sup>14</sup>Informal evidence suggests that employment protection was high in France even in the

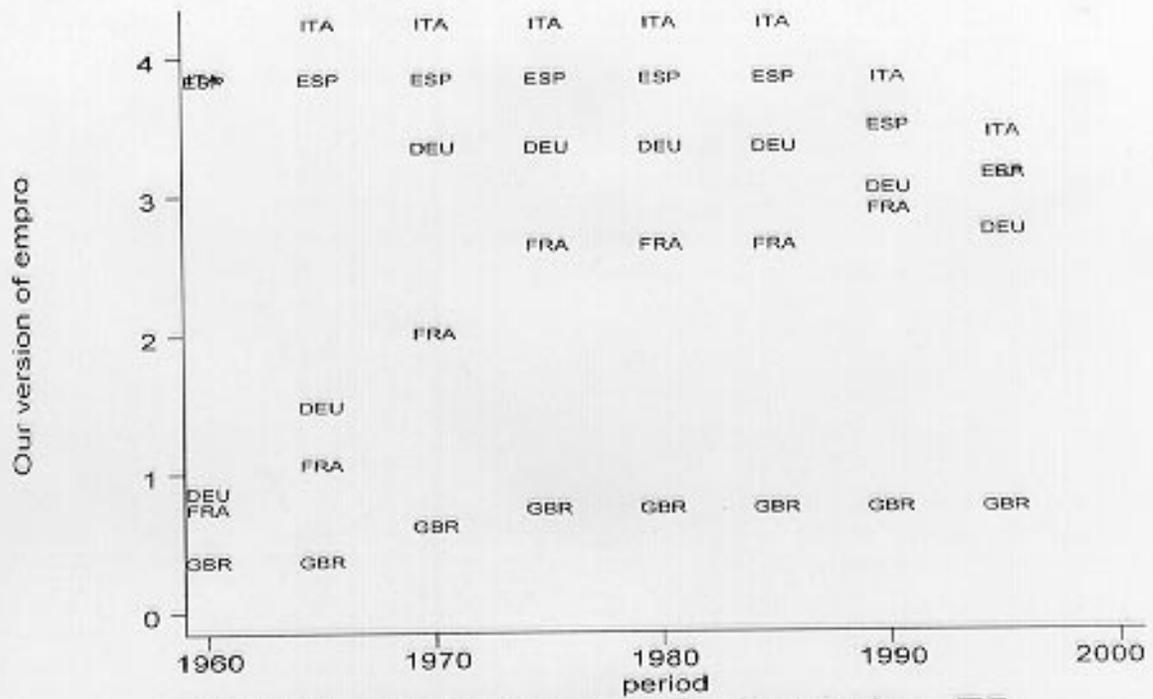


Figure 9. Employment protection index, E5

To conclude: There is enough heterogeneity in labor market institutions within Europe to potentially explain differences in unemployment today. As to the evolution of institutions over time: It is clear that neither the view that labor market institutions have been stable through time, nor the view that labor market rigidities are a recent development are right. Some countries have had these institutions for a long time, others have acquired them more recently. There clearly was an increase in employment-unfriendly institutions in the late 1960s and early 1970s. Since then, there appears to have been a small but steady decline.

### 3 Time effects and interactions

In looking more formally at the data, we proceed in two steps. In this section, we treat shocks as unobservable but common across countries. In the next, we treat shocks as observable and country specific.

To make it easier to relate our results to the existing literature, our first specification in this section relies on the set of time invariant measures for institutions used by [7].<sup>15</sup> The specification is the following:

$$u_{it} = c_i + d_t \left( 1 + \sum_j X_{ij} b_j \right) + e_{it} \quad (1)$$

where  $i$  is a country index,  $t$  a (5-year) period index, and  $j$  an institution index. The dependent variable,  $u_{it}$ , is the unemployment rate in country  $i$  in period  $t$ .  $c_i$  is the country effect for country  $i$ .  $d_t$  is the time effect for period  $t$ .  $X_{ij}$  is the value of institution  $j$  in country  $i$  (in this first specification, we do not allow for time variation in institutions, so there is no index  $t$ .) The specification allows for the effects of the common time effects on unemployment to depend on the specific set of labor market institutions of a country. This dependence is captured by the parameters  $b_j$ .

We estimate this equation using data from 20 countries—the same set of countries as Nickell: The E15 countries listed and examined earlier, plus the United States, Canada, New Zealand, Australia and Japan. (These countries are clearly important controls for any story about European unemployment). There seems to be little point in looking at year-to-year movements in institutions or in shocks (we shall introduce time varying institutions later in this section, and time varying observable shocks in the next) unless one allows for a generous lag structure, and this would take us too far. So, as in earlier figures, we divide time in 8 five-year periods, from 1960–65 to 1995+.

Following Nickell, we use measures for eight “labor market institutions” (a brief description of the eight measures is given in the appendix, but the reader is referred to [7] for more details):

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1960s. Again, this is not reflected in the Lazear measure, and by implication, not reflected in our measure either. This may be an issue for other countries as well.

<sup>15</sup>Nickell gives values for these institutions for both 1983-1988, and 1989-1994. We use the average.

- Three of them measure aspects of the social treatment of unemployment: the replacement rate (RR), the number of years over which unemployment benefits are paid (Ben), and a measure of active labor market policies (ALMP).
- One is a measure of employment protection (EP).
- One is a measure of the tax wedge (Tax). And the last three measure aspects of collective bargaining: union contract coverage (Cov), union density (Den), and (union and employer) coordination of bargaining (Coor).

The specification of equation (1) is clearly more a description of the data than the outcome of a tightly specified theory of interactions. Let us take up two issues here:

First, many of the models emphasizing interactions suggest that the main effect of labor market institutions may be to affect the persistence of the effects of shocks on unemployment, rather than their magnitude—as captured in (1) (see again our companion paper for a discussion and references). Given the short time series dimension of the data, introducing interaction dynamics in (1) would be unwise. And, when looking at five-year averages, more persistence translates into a stronger average effect of the shock over the five-year period.

Second, one might argue against the introduction of country effects altogether. If one believes that all differences in the average level of unemployment across countries are due to the eight institutions listed above, one can replace the country dummies by the set of institutions and estimate their effect on the level of unemployment. We shall show the results of such a specification below (the conclusions remain largely the same); but we do not find it a plausible assumption and do not use this as our benchmark.

Equation (1) is estimated by non-linear least squares. The results of estimation are presented in Table 1. All the measures of labor market institutions are defined so that an increase in the measure is expected to increase the effect of an adverse shock on unemployment: the expected sign of each  $b_j$  is positive.<sup>16</sup> Also all measures of institutions are constructed as deviations from the cross country mean; this way the time effects gives the evolution of unemployment for a country with mean values of all 8 institutions.

The results of Table 1 are surprisingly strong (relative to our priors). The estimated equation gives the following description of the data:

- Estimated time effects account for an increase in the unemployment rate equal to 7.2%. That is, the equation implies that, if a country had had mean values for all eight institutions, its unemployment rate would have grown by 7.2% over the period.

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<sup>16</sup>Thus, we multiply the original Nickell measures of active labor market policies and of coordination by  $-1$ . We take the expected effect of employment protection to be that more employment protection leads to a larger effect of adverse shocks on unemployment, and the expected effect of coordination that more coordination reduces the effects of adverse shocks on unemployment

Table 1. Time effects interacted with fixed institutions.

	(1) Coefficients	(2) Range of independent variable		(3) Implied range of effect of shock (mean = 1)	
Time effects *	7.2%				
Replacement rate	0.017 (4.9)	-40.0	30.0	0.32	1.51
Benefit length	0.202 (4.7)	-2.0	1.6	0.60	1.32
Active labor policy	0.017 (2.9)	-47.0	9.5	0.30	1.16
Employment protection	0.044 (3.0)	-9.5	9.5	0.68	1.32
Tax wedge	0.018 (3.1)	-17.0	22.0	0.71	1.37
Union coverage	0.101 (0.5)	-1.7	0.3	0.83	1.03
Union density	0.008 (2.0)	-30.0	39.5	0.76	1.32
Coordination	0.299 (5.1)	-2.0	2.0	0.40	1.60
Country effects	yes				
$\bar{R}^2$	0.948				

\*: Time effects: Estimated time effect for 1995+ minus estimated time effect for 1960-1965. Column (1): regression results, *t*-statistics in parentheses.

- Coefficients on all 8 institutions have the predicted sign. All are significant, except for the union coverage variable. The two most statistically significant variables are the replacement rate and the duration of benefits.

To give a sense of magnitudes, column (2) gives the range for each institutional measure (recall that these are deviations from the cross country mean). Column (3) then shows the effect of a given shock for the lowest and highest value of the corresponding institution. The way to read the column is as follows. Take three countries, all with mean values for institutions except one—say, employment protection in line 5. Take an adverse shock which has an effect of 1 on unemployment in the country with the mean value of employment protection. Then the same shock will have an effect of only 0.68 in the country with the lowest employment protection, but an effect of 1.32 in the country with the highest employment protection. The conclusion one should draw from column (3) is, given the existing variation in labor market institutions, the range of the effects of institutions on the impact of a given shock on unemployment is roughly similar across institutions.

- Not only are the coefficients plausible, but the model does a good job of explaining the differential evolution of unemployment rates across countries. Figure 10 plots the change in the fitted unemployment rate from 1965-70 to 1995+. The fit is quite good. Interactions between common shocks and different institutions can account for much of the actual difference in the evolution of unemployment rates across countries. (Recall that a pure time effect model with no interactions would predict no variation in predicted unemployment rates across countries: all the points would lie on a horizontal line.)

In short, equation (1) gives a surprisingly good description of the heterogeneity of unemployment evolutions as the result of common shocks interacting with different institutions. These results are indeed consistent with the two cross sections estimated by Nickell, and show that his results are robust both to the use of a longer time period and the introduction of country effects.<sup>17</sup>

One must worry however that these results are in part the result of economic Darwinism. The measures used by Nickell have all been constructed ex-post facto, by researchers who were not unaware of unemployment developments. When constructing a measure of employment protection for Spain, it is hard to forget that unemployment in Spain is very high... Also, given the complexity in measuring institutions, measures which do well in explaining unemployment have survived better than those that did not. Thus, in the rest of the section, we look at robustness, both vis a vis alternative specifications, and vis a vis the use of alternative—including time varying—measures of institutions.

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<sup>17</sup>There are however some differences between estimated coefficients. In particular: Employment protection is significant here, not in Nickell. Union coverage is not significant here, but is significant in Nickell.

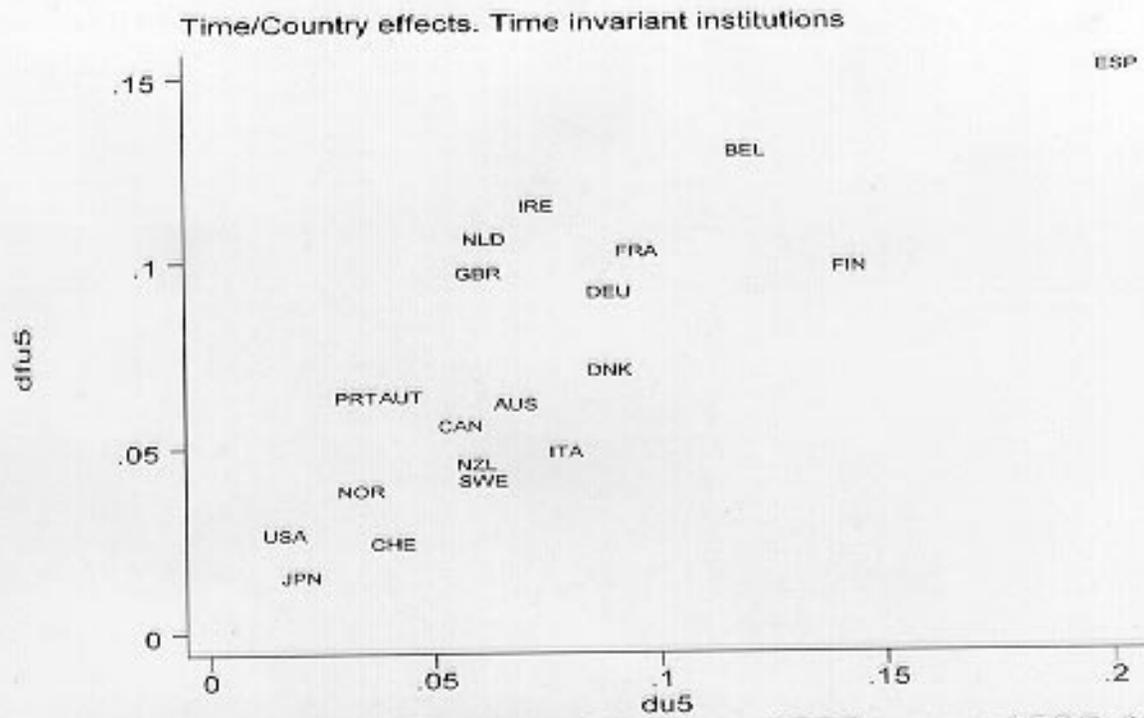


Figure 10. Actual and Predicted Delta  $u$ ; 1995+ over 1965-1970

Table 2 looks at alternative specifications. First, to give a sense of bivariate rather than multivariate relations, column (1) reports the results of 8 separate regressions, each regression allowing interactions with only one of the 8 measures for institutions. When introduced on their own, three measures are highly significant: the length of benefits, the degree of employment protection, and the degree of union coverage (which is insignificant in the multivariate specification). In contrast, the replacement rate, which is highly significant in the multivariate specification, is insignificant when introduced alone.

Column (2) reports the results of a single multivariate regression, replacing country effects by the levels of the institutional variables. That is, it imposes the constraint that all differences in unemployment levels be explained by differences in institutions. Only the coefficients on interactions are reported in column (2). They are roughly the same as in Table 1. The coefficients on the levels are typically insignificant. The fit is substantially worse than in Table 1.

Columns (3) and (4) present an attempt to adjust unemployment for deviations of actual from equilibrium unemployment. We start from the assumption that the following relation holds between the change in inflation, the actual and the equilibrium rate of unemployment:

$$\Delta\pi_{it} = -a(u_{it} - u_{it}^*)$$

We then construct “equilibrium unemployment” as  $u_{it}^* = u_{it} + (1/a)\Delta\pi_{it}$ ;  $1/a$  is often called the sacrifice ratio. Estimates of  $a$  for Europe for annual data typically range from 0.25 to 0.50.<sup>18</sup> Column (3) constructs  $u^*$  using a sacrifice ratio of 2.0; column (4) does the same using a ratio of 4.0.<sup>19</sup> Not much happens. The coefficients are very similar to those in Table 1;  $\bar{R}^2$  is slightly lower.

Table 3 looks at the implications of using alternative measures for some of the institutions.<sup>20</sup> Columns (1) and (2) look at alternative measures for replacement rates. Columns (3) and (4) look at alternative measures for employment protection.

Using the OECD database on replacement rates for each country since 1961, we construct an alternative set of two measures of the generosity of unemployment insurance. The first measure, RR1, is the replacement rate during the first year of unemployment averaged over all categories. The second, RR25, is the replacement rate during years 2 to 5 of unemployment, averaged over all categories and over all four years.

Column (1) shows the results of estimation using time invariant values for RR1 and RR25. For comparisons with the results using Nickell’s measures which apply to the late 1980s and early 1990s, we use the mean value of the two replacement rates for the period 1985–1990. Measures for the other 6 institutions

<sup>18</sup>If our approach to measuring the equilibrium unemployment rate is right however, then most existing estimates of  $a$ , which rely on a much rougher measure of equilibrium unemployment, are not right. We did not take up the task of estimating  $a$  in this paper.

<sup>19</sup>In doing so, we are implicitly assuming that the sacrifice ratio is not related to institutions. This is probably incorrect.

<sup>20</sup>This is the work in progress part of the paper.

Table 2. Time effects interacted with fixed institutions. Alternative specifications.

	(1)	(2)	(3)	(4)
	Institutions entered individually	No Country effects	$u^*$ sacrifice ratio=2.0	$u^*$ sacrifice ratio=4.0
Time effects		9.2%	6.6%	6.0%
RR	0.004 (1.0)	0.017 (4.1)	0.018 (4.7)	0.019 (3.8)
Ben	0.267 (5.8)	0.213 (4.1)	0.240 (4.9)	0.276 (4.3)
ALMP	0.007 (1.1)	0.017 (2.3)	0.020 (3.0)	0.025 (2.9)
EP	0.041 (3.5)	0.050 (2.8)	0.040 (2.5)	0.035 (1.7)
Tax	0.012 (2.0)	0.017 (2.4)	0.018 (2.9)	0.019 (2.4)
Cov	0.512 (4.2)	0.050 (0.2)	0.124 (0.6)	0.139 (0.5)
Dens	-0.002 (-0.4)	0.009 (1.8)	0.008 (1.7)	0.008 (1.4)
Coor	0.045 (0.8)	0.300 (4.2)	0.320 (4.3)	0.344 (4.0)
CE	yes	no	yes	yes
$\bar{R}^2$		0.923	0.942	0.912

Column (1): each coefficient is estimated using a different regression, allowing interactions between the time effects and the specific institution variable. Column (2): Values of institutional measures entered, but coefficients not reported. Columns (3) and (4): The dependent variable is equilibrium unemployment,  $u = 1/a\Delta\pi$ , where  $1/a$ , the sacrifice ratio, is 2 in column 3, 4 in column 4.

are the same as in Table 1. The fit is a bit worse than in Table 1. The two replacement rates are both individually significant, and jointly highly significant. Other coefficients are often less significant. In particular, the coefficient on employment protection is smaller, and less significant.

Column (2) shows the results of estimation using time-varying measures for RR1 and RR25. Relative to column (1), the fit, measured by the  $\bar{R}^2$  is only marginally improved. The part of the increase in unemployment due to time effects decreases from 7.2% to 6.2%: Some of the increase in unemployment is now explained by the increase in replacement rates. Other coefficients are largely the same as in column (1).

Columns (3) and (4) use the index of employment protection discussed in Section 2. In contrast to the Nickell index, which is a ranking of countries and thus ranges from 1 to 20, this index is a cardinal index, ranging theoretically from 0 to 6, empirically from 0 to about 4. Thus, in comparing coefficients to those obtained using the Nickell specification, keep in mind that the coefficients should be roughly 5 times larger to generate the same effect on unemployment.

Column (3) shows the results of estimation using time-invariant values of the index, equal to its value for 1985-1990. (The index for this time period is more reliable than for earlier periods— when we have to combine different sources to construct the index.) The results are very similar to Table 1.  $\bar{R}^2$  is a little higher. The effect of employment protection is similar in magnitude to that in Table 1 (i.e the coefficient is about 5 times larger), and highly significant.

Finally, column (4) shows the results of estimation using the time varying values of the employment protection index. Allowing for time variation does not improve the results. The part of the increase in unemployment accounted for by time effects increases to 8%.  $\bar{R}^2$  is slightly lower. The coefficient on the employment protection index decreases by nearly half and becomes less significant. These results can be read in three ways, and we do not yet have a strong view as to which one is right. First, the effects of employment protection are in fact less strong than suggested by previous regressions using time-invariant measures. Two, the series we have constructed are not very reliable; as we discussed in Section 2, we are worried about the evolution of the index early on. Three, the results come from reverse causality. Under this interpretation, the rise in unemployment has led over time to more employment protection, which is why there is a close relation between employment protection at the end of the sample and unemployment. But employment protection has little effect on unemployment, which is why the relation is weaker when using time series. Given the lack of strong evidence about the presence of a strong and reliable feedback from unemployment to institutions, we are skeptical; but we cannot exclude this interpretation.

To summarize the results of this section, a model with common unobservable shocks and interactions with institutions provides a good description of the evolution of unemployment rates across time and countries. The description appears reasonably robust—although less so with respect to time variation in institutions. This conclusion leaves open the issue of what these shocks might have been, and whether they have indeed been similar across countries. For this

Table 3. Time effects interacted with institutions. Alternative measures

	(1)	(2)	(3)	(4)
	Alternative replacement rates	Time varying replacement rates	Alternative employment protection	Time varying employment protection
Time effects	7.3%	6.2%	7.1%	7.1%
(N) RR			0.016 (5.1)	0.016 (4.6)
(N) Ben			0.231 (5.3)	0.195 (4.3)
(Alt) RR1	0.008 (2.5)	0.007 (2.0)		
(Alt) RR25	0.009 (1.5)	0.018 (2.6)		
(N) ALMP	0.013 (1.6)	0.005 (0.5)	0.018 (3.2)	0.015 (2.5)
(N) EP	0.021 (1.4)	0.031 (1.7)		
(Alt) EP			0.286 (4.2)	0.170 (2.3)
(N) Tax	0.015 (2.4)	0.015 (2.1)	0.018 (3.4)	0.020 (3.5)
(N) Cov	0.399 (2.2)	0.395 (1.9)	0.088 (0.6)	0.272 (1.8)
(N) Dens	0.004 (0.8)	0.000 (0.0)	0.009 (2.5)	0.007 (1.7)
(N) Coor	0.258 (4.6)	0.322 (4.5)	0.383 (6.1)	0.347 (5.1)
CE	yes	yes	yes	yes
$\bar{R}^2$	0.933	0.935	0.951	0.946

(N) means Nickell measure. Column (1): estimation using time-invariant values of RR1 and RR25, equal to their average values for 1985-1990. Column (2): estimation using the time series for RR1 and RR25. Column (3): estimation using the value of EP for the late 1980s. Column (4): estimation using the time series for EP.

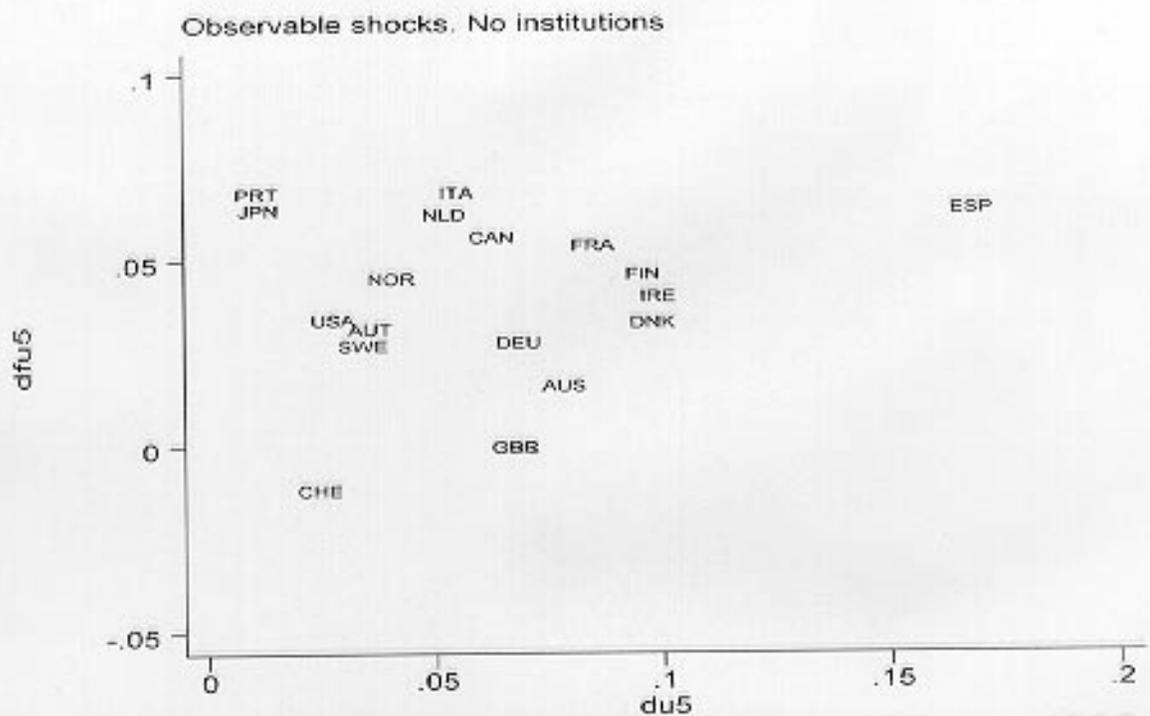


Figure 11. Actual and Predicted Delta u 1990-1995 over 1965-1970

reason, we now turn to a specification based on observable shocks.

## 4 Observable shocks and interactions

The benchmark specification we use in this section is the following:

$$u_{it} = c_i + \left( \sum_k Y_{kit} a_k \right) \left( 1 + \sum_j X_{ij} b_j \right) + e_{it} \quad (2)$$

where the notation is the same as before, but the unobservable common shocks of section 3 are now replaced by a set of country specific shocks;  $Y_{kit}$  denotes shock  $k$  for country  $i$  in period  $t$ .<sup>21</sup> (Again, our benchmark relies on time invariant measures of institutions, thus the lack of an index  $t$  for  $X$ . Later on, we look at results allowing for time variation for institutions.)

Following the discussion in Section 2, we consider three variables for the shocks and construct them for each country and each period. They are the rate of TFP growth, the real rate of interest, and the labor demand shift measure, respectively. We enter them as levels, but, given the presence of country dummies in the regression, they can be thought of as deviations from country averages— or from 1960 values. To make it easy to read the tables, each shock variable is measured so an increase is expected to increase unemployment initially; therefore the original measure of TFP growth is multiplied by  $-1$ . Due to some missing data for some countries, the panel is (slightly) unbalanced. Also, one observation requires special treatment. As discussed in [1], the Portuguese revolution was associated with a large permanent increase in the measured labor share (20% of GDP)—without a corresponding increase in unemployment. While this evolution is interesting in its own right, we decided to eliminate this effect by allowing for a dummy for Portugal, from 1960 to 1975.<sup>22</sup>

The natural first question is: Ignoring differences in institutions, how much of the evolutions of unemployment across time and countries can be explained using these three shocks? The answer is given in Table 4 and in Figure 11.

Table 4 presents regressions of the unemployment rate on the three shocks, leaving institutions out. Column 1 allows only for current values of the three shocks (recall however that each period is a five-year period). Each of the three shocks is significant, and the magnitudes of the coefficients are interesting. A decrease in TFP growth of 3 percentage points, as has happened in many countries, translates into an increase in the unemployment rate of 1.3%. An increase in the real interest rate of 5 percentage points leads to an increase in the unemployment rate of 3%. A decrease in the adjusted labor share of 10%, such as happened in France and in Spain since the mid 1980s, leads to

<sup>21</sup>Most theories predict that the interaction of institutions and shocks may be different for different shocks. But allowing for different interactions between each shock and each institution struck us as asking too much from our limited data set (which in this section, given data limitations, includes between 130 and 140 data points, depending on the specification).

<sup>22</sup>The difference between macro and labor panel data regressions is that, in macro, each data point is intimately known by the researcher...

Table 4. Shocks only.

Dependent var	(1) u (no lags)	(2) u (current and lagged)	(3) u* sacrifice ratio=2.0	(4) u* sacrifice ratio=4.0
TFP growth	0.43 (2.8)	0.36 (1.9)	0.32 (2.3)	0.22 (1.5)
lagged		0.67 (4.5)		
Real rate	0.61 (5.1)	0.42 (3.8)	0.61 (5.4)	0.60 (5.2)
lagged		-0.00 (0.0)		
LD shift	0.18 (2.4)	0.24 (2.4)	0.17 (2.4)	0.16 (2.2)
lagged		-0.05 (-0.7)		
CE	yes	yes	yes	yes
$\bar{R}^2$	0.583	0.706	0.673	0.576

an increase in the unemployment rate of about 2%. So, these shocks appear indeed to explain part of the evolution of the unemployment rate across time and countries.

Do differences in the magnitude of shocks easily explain the cross country heterogeneity in unemployment increases? The answer is no; this is shown in Figure 11. The figure plots the change in fitted unemployment against the change in actual unemployment from 1965-1970 to 1990-1995 (this is the longest time span for which data are available for all countries.). The relation is positive, but poor. The Netherlands and Spain have the same predicted increase in unemployment, yet very different outcomes. In short, the heterogeneity of shocks cannot account for much of the heterogeneity of unemployment evolutions.

The other columns in Table 4 explore variations of column (1). Column 2 allows for lags of each of the three variables. (Allowing for lagged unemployment with in effect 7 data points in the time dimension would be unwise). Both current and lagged TFP growth are significant. While theory suggests that the effects may build up for some time —as higher wages relative to TFP lead to low profit, and lower capital accumulation, it also suggests that the effects should eventually go away. There is no evidence of this in column 2. Only effects of the current real interest rate are significant; this sheds some doubt on the notion that the real interest rate works through capital accumulation and labor demand and suggests that some of the effects work through aggregate demand and the deviation of actual from equilibrium unemployment. The effects of the LD shift conform to the theory, positive initially, negative later. Columns 3 and 4 replace actual by equilibrium unemployment, constructed as in the previous section, for two values of the sacrifice ratio, 2.0 and 4.0. The fit in column (3) is better than in column (1) —but the dependent variable is not the same—; the effects of each of the three variables are similar.

Table 5 presents the results of the specification that allows for both shocks and interactions with institutions. Column (1) presents the results from estimating the benchmark specification (2).

The three variables measuring shocks are again very significant (more so than in Table 4). The effect of TFP growth is larger than in Table 4, the effects of the real interest rate slightly smaller.

Coefficients on 7 of 8 institutions have the expected sign. Only union coverage is negative, but insignificant. The most significant coefficients are on the replacement rate and the length of benefits. Except for union coverage, the pattern of coefficients is the same as in Table 1 (estimated with unobservable shocks), up to a factor of proportionality greater than 1. That is, they are in general 1.5 to 2 times larger than in Table 1. The mechanical explanation is that the observable shocks explain less of the general increase in unemployment, and the interactions must therefore explain more. The  $\bar{R}^2$  is much lower than in Table 1: despite the fact that they may differ across countries, observable shocks do not do as good a job as the set of 8 time effects in Table 1.

The specification does a good job of explaining differences in unemployment evolutions across countries. This is shown in Figure 12, which plots the change in fitted unemployment against the change in actual unemployment, from 1965-

Table 5. Shocks interacted with fixed institutions.

	(1) Benchmark equation	(2) Institutions entered individually	(3) $\alpha^*$ sacrifice ratio=2.0
TFP growth	0.73 (5.1)		0.60 (4.4)
Real rate	0.47 (5.0)		0.49 (5.7)
LD shift	0.18 (2.5)		0.14 (2.2)
RR	0.026 (3.8)	0.013 (2.4)	0.025 (3.7)
Ben	0.473 (5.1)	0.203 (2.3)	0.308 (3.3)
ALMP	0.030 (1.4)	-0.009 (-0.7)	0.034 (1.6)
EP	0.090 (2.5)	0.048 (2.7)	0.085 (2.4)
Tax	0.034 (2.4)	0.026 (2.6)	0.039 (2.7)
Cov	-0.453 (-1.0)	0.641 (3.0)	-0.417 (-0.9)
Dens	0.033 (2.9)	-0.002 (-0.8)	0.032 (2.8)
Coor	0.421 (2.9)	-0.039 (-0.4)	0.447 (3.0)
CE	yes	yes	yes
$\bar{R}^2$	0.671		0.699

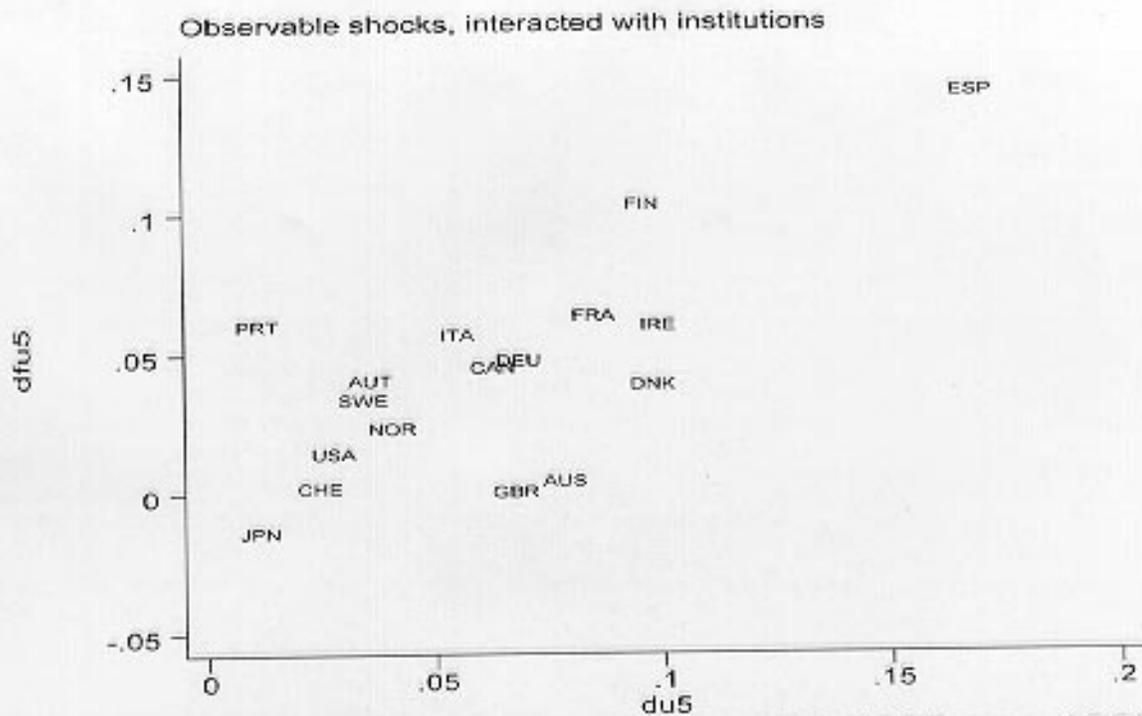
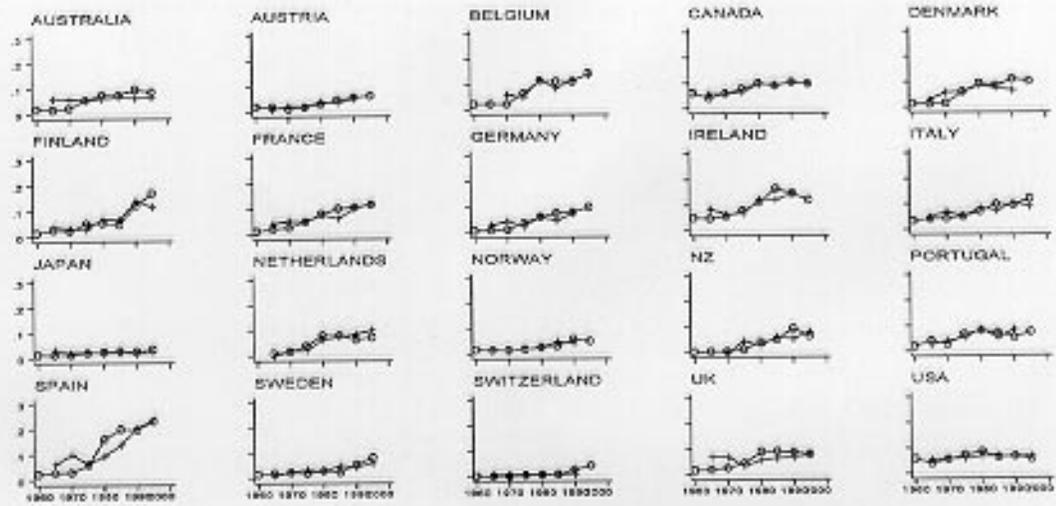


Figure 12. Actual/Predicted changes in  $u$ , 1990-1995 over 1965-1970

## Shocks interacted with institutions



period

Figure 13. Actual and Predicted Unemployment Rates, by country

1970 to 1990-1995. The fit is quite good; clearly much better than in Figure 11, if not quite as good as in Figure 10. Figure 13 gives another way of looking at fit, by plotting the actual and fitted unemployment rate for each of the 20 countries over time. The visual impression is one of a good fit in nearly all cases (to facilitate comparison across countries the vertical scale is the same across countries. This unfortunately makes it harder to see the fit in each country.)

Column (2) looks at the effects of entering institutions one at a time. The conclusions are largely similar to those in the previous section. In particular, union coverage is very significant on its own, but not in combination with other institutions. Column (3) replaces actual by equilibrium unemployment, assuming a sacrifice ratio of 2.0. The fit is better, but the results are otherwise very similar.

Table 6 looks at alternative measures of institutions. Its structure is the same as for Table 3. Columns (1) and (2) look at the effects of using the two measures of replacement rates using OECD data. Column (1) uses a time invariant value equal to the average for 1985-1990; column (2) uses the time series. Columns (3) and (4) do the same, for employment protection. The table suggests two conclusions, both worrisome: Replacing the Nickell measures by alternative, but time invariant measures, substantially decreases the  $\bar{R}^2$ . Going from the time invariant to the time varying measures further decreases the fit. The coefficients on institutions remain consistently positive, but are typically smaller than in Table 5, and less significant. These results lead to the same discussion as in Section 3: Luck, or data mining, when the standard set of measures is used? Poor time series for institutions, interacting here with the fact that we are looking at their product with time varying and also imperfectly measured shocks? Or reverse causality (although the fact that the deterioration of fit happens when replacing one time invariant measure by another is not supportive of this hypothesis).

The conclusion we draw from the results in this section is that one can indeed give a good account of the evolution of unemployment across countries and times by relying on observable shocks and interactions with labor market institutions. There are clearly reasons to worry: The dynamic effects of shocks are not obviously consistent with the theory; the results are weaker when using time varying institutions. But, again, the results strike us as surprisingly good overall.

## 5 Conclusions

We have shown that an account of the evolution of unemployment based on the interaction of shocks and institutions does a good statistical job of fitting the evolution of unemployment both over time and across countries.

If this account is correct, one can be mildly optimistic about the future of European unemployment. The effects of some of the adverse shocks should go away. The real interest rate is likely to be lower in the future than in the recent past. The dynamic effects of what we have identified as adverse labor

Table 6. Shocks interacted with institutions. Alternative measures of institutions.

	(1) Alternative replacement rates	(2) Time varying replacement rates	(3) Alternative employment protection	(4) Time varying employment protection
TFP growth	0.57 (3.8)	0.54 (3.6)	0.62 (4.2)	0.65 (4.3)
Real rate	0.51 (4.6)	0.51 (4.8)	0.50 (5.0)	0.51 (5.2)
LD shift	0.18 (2.1)	0.17 (2.2)	0.18 (2.3)	0.17 (2.2)
(N) RR			0.022 (3.0)	0.020 (3.0)
(N) Ben			0.195 (2.2)	0.156 (2.0)
(Alt) RR1	0.014 (1.8)	0.008 (1.1)		
(Alt) RR25	0.006 (0.4)	0.013 (0.9)		
(N) ALMP	0.014 (0.6)	0.001 (0.1)	0.016 (0.8)	0.008 (0.4)
(N) EP	0.051 (1.1)	0.049 (1.1)		
(Alt) EP			0.218 (1.3)	0.083 (1.1)
(N) Tax	0.023 (1.6)	0.018 (1.1)	0.036 (2.4)	0.031 (2.3)
(N) Cov	0.087 (0.2)	0.213 (0.5)	0.182 (0.6)	0.390 (1.5)
(N) Dens	0.020 (1.7)	0.013 (1.1)	0.025 (2.1)	0.019 (2.0)
(N) Coor	0.341 (2.1)	0.285 (1.9)	0.512 (2.9)	0.454 (2.9)
CE	yes	yes	yes	yes
$\bar{R}^2$	0.624	0.618	0.656	0.654

demand shifts should eventually prove favorable to employment. Institutions are also slowly becoming employment-friendly. Further improvements should help reduce unemployment—although the poor results obtained using time-varying institutions make us reluctant to push this proposition strongly, at least based on the evidence in this paper.

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# The consequences of labor market flexibility: Panel evidence based on survey data<sup>☆</sup>

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## Abstract

We introduce a new data set on hiring and firing restrictions for 21 OECD countries for the period 1984–1990. The data are based on surveys of business people in the countries covered, so the indices we use are subjective in nature. Controlling for country and time fixed effects, and using dynamic panel data techniques, we find evidence that increasing the flexibility of the labor market increases both the employment rate and the rate of participation in the labor force. A conservative estimate suggests that if France were to make its labor markets as flexible as those in the US, its employment rate would increase 1.6 percentage points, or 14% of the employment gap between the two countries. The estimated effects are larger in the female than in the male labor market, although both groups seem to have similar long-run coefficients. There is also some evidence that more flexibility leads to lower unemployment rates and to lower rates of long-term unemployment. We also find evidence consistent with the hypothesis that inflexible labor markets produce “jobless recoveries” and introduce more unemployment persistence.

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## 1. Introduction

One of the biggest challenges in economics today is to explain what causes European unemployment. Commentators on the European situation often blame poorly designed

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<sup>☆</sup> Part of this research was carried out while the first author was at the Fundacion Mediterranea in 1996 and the second was at ZEI, University of Bonn.

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labor market institutions, a view that sometimes goes by the ugly name of “Eurosclerosis”. Economists advising governments on these issues share more or less the same diagnostic: Regulations such as hiring and firing restrictions faced by firms, as well as the generous welfare state that protects the unemployed, are behind the differential labor market performances of Europe and America. A number of countries have taken this view seriously. Great Britain and France are just two examples of countries that followed the economists’ advice and reduced hiring and firing restrictions in the mid-1980s to combat high unemployment. This view of the labor market has also inspired large reform programs in the less developed world, where unemployment has recently increased. In fact, deregulation of the labor market is part of what the IMF and the World Bank often call “second-generation reforms”.<sup>1</sup>

Since unemployment brings real misery to people’s lives, and job security provisions often involve delicate redistribution issues between richer firm owners and poorer workers, one would think that economists giving such advice know what they are doing. More precisely, one would think that there are hundreds of papers studying whether more flexibility does in fact reduce a country’s unemployment rate in practice. Sadly, this is not the case. To our knowledge, there is one panel study on the effects of labor market flexibility across countries (Lazear, 1990). And only a couple of cross-section studies, like the early one of Bertola (1990) based on evidence for 10 countries or that in the OECD Jobs Study (1994) based on 21 observations.<sup>2</sup> Addison and Grosso (1996) revise Lazear’s data and obtain different estimates with respect to unemployment (they find no evidence favoring the hypothesis that severance pay increase unemployment).<sup>3</sup> Gregg and Manning (1997) review some of the available evidence on the effects of labor market flexibility and argue that it is “*much less persuasive than is commonly believed*”, and that the profession’s “*faith in the merits of labor market de-regulation is misplaced*” (p. 395). There is, perhaps, no experience more sobering to an economist than to review the state-of-the-art evidence on the effects of firing costs and to reflect on the social costs of unemployment.

The contribution of this paper is empirical. We introduce a new data set on hiring and firing restrictions for 21 OECD countries for the 7-year period covering 1984–1990. The data are based on surveys of business people in the countries covered, so the indices we use are subjective in nature. We also use the new summary measure of the parameters of the unemployment insurance system compiled by the OECD in 1994, which constitutes a significant improvement on previous benefit data available in the profession. We then present an empirical analysis of the effect of flexibility on a number of labor market variables that follows and extends the contributions of Lazear (1990). Controlling for country and time fixed effects, and using dynamic panel data techniques developed by Arellano and Bond (1991), we find evidence that relaxing job security provisions increases the employment rate and the participation rate. The estimated

<sup>1</sup> The IMF suggested that Argentina should increase the flexibility of the labor market, after unemployment reached 18.6% following the pro-market reforms of the early 1990s.

<sup>2</sup> Even in-depth single country studies are relatively rare. The interested reader is referred to the work of Abraham and Houseman (1994), Kugler (1999) and Hunt (1994) and Autor (2003).

<sup>3</sup> They emphasize a number of differences with Lazear’s study (e.g. with respect to advance notice requirements), but they do find similar results with respect to three out of four variables.

effects seem large. The fixed effects estimate tells us that, if France were to reform its labor markets and make them as flexible as the American, its employment rate would increase by 1.6 percentage points.<sup>4</sup> This is equivalent to 14% of the employment rate gap between the two countries. In order to express this effect in terms of *GDP* per capita, we note that it implies an increase in total employment of 2.8%. In the short run, the estimated effects are stronger for females than for males, although interestingly both groups have roughly similar long run coefficients. There is also evidence that a more flexible labor market leads to lower unemployment rates and to a lower proportion of long-term unemployed in the unemployment pool. The effect of unemployment benefits on these variables is less clear-cut. As a general point, we think it is reassuring that, in spite of using such a different approach, our results are not out of line with those obtained by Lazear. We also document the basic correlation of flexibility with inflows and the rate of unfilled vacancies, and review the hypotheses that inflexible labor markets produce “jobless recoveries” and introduce more unemployment persistence.

The main empirical evidence on the effect of labor market flexibility that we have available today is presented in Lazear (1990). He uses data on severance pay and periods of notice required before employment termination for 22 developed countries for the period 1956–1984, and finds some evidence that they have a negative relationship with the employment rate and a positive one with the unemployment rate. For example, Lazear finds that the amount of money paid to the worker as severance enters negatively and significantly in univariate regressions on country means (18 observations) explaining the employment rate, the participation rate and the number of hours worked per week. The coefficient on severance pay in the unemployment regression is positive but insignificant, however. In univariate regressions explaining the unemployment rate and the number of hours worked that include country dummies (468 observations), the coefficient on severance pay keeps its sign and turns significant. It is insignificant, however, when explaining the employment rate or the rate of labor force participation (where it also changes sign).

Lazear points out a number of limitations in these data. Amongst them is the fact that information on one type of worker (blue collar with 10 years of service) is used as a proxy for the entire system. Second and more significantly, information on two types of institutions (amount of severance pay and months of advance notice before dismissal) are used to proxy for a large number of employment regulations that affect the flexibility of the labor market.<sup>5</sup> Clearly, flexibility of the labor market could be affected without showing up in these two series. Third, it does not allow for the fact

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<sup>4</sup> France is the median country in terms of flexibility, though it is below the mean. See Table 1 for the full data description.

<sup>5</sup> For example, Grubb and Wells (1993) describe five other types of regulations that are relevant besides the restrictions on an employer’s freedom to dismiss workers. These include limits on the use (or the legal validity) of fixed-term contracts; limits on the use of temporary work agencies, restrictions on weekly hours of regular or overtime work; limits on shift, weekend and night work; and limits on employer’s use of part time work. The OCED Jobs Study (1994) notes that an employer’s freedom to dismiss workers can be restricted by a number of requirements other than a requirement of advance notice. These include a requirement of authorization by third parties (e.g. government, or trade union), provisions for appeal against unfair dismissal and the enforcement of these rules.

that countries differ in the degree of enforcement of these laws, and that other, perhaps informal, aspects may be more important than the written laws. Lastly, Lazear points out that “*for the most part, rules change once or twice during the period per country, so much of the mileage is cross-sectional rather than time-series*” (Lazear, 1990, p. 708). Yet, it is the best data that economists have available to study a most important set of issues.

The flexibility data used in this paper come from the *World Competitiveness Report* (WCR).<sup>6</sup> The WCR requests the opinion of a number of top and middle managers (on average 1,531 each year) on the flexibility enterprises have to adjust things like compensation and employment levels to economic realities in each of the countries covered. By its nature, these data avoid some of the objections raised to the data used by Lazear. For example, it uses information provided by business people who, presumably, are in a position to judge what aspects of flexibility laws actually affect business conditions. Furthermore, it passes simple validation tests. For example, it correlates well with the index of “*strictness of employment protection legislation*” constructed for the *OECD Jobs Study* (1994), arguably the most complete measure available, for the 1 year where both types of data are available (1989). There are, of course, limitations to the data we use. The time series dimension of the panel is considerably shorter than that of Lazear’s (7 versus 29 years). Importantly, the question asked is more vague than what ideally an economist would like to use. Furthermore, a lower set of answers in one country may simply reflect the fact that people there use a different cardinal ranking than people in other countries. Though some of these objections can be tackled in the empirical section, the fact remains that subjective responses should be treated with caution. However, we believe the topic to be of such economic and social significance, and the data that so far has been available to the profession to be of such poor quality, that a willingness to experiment with survey data is justified.<sup>7</sup>

In Section 2, we discuss briefly some of the theoretical background for our study, present our empirical strategy and explain the data used in the paper. Section 3 presents the empirical results while Section 4 concludes.

## 2. Theory, empirical strategy and data description

### 2.1. Theory

On the theoretical side, Lazear (1990) points out that if markets are complete, mandated severance payments should not have real effects. The argument is that the firm-worker pair can undo the firing costs imposed on them by a reverse transfer from the worker to the firm at the onset of the employment contract. Bertola (1990) finds that job security legislation does not bias labor demand toward lower average

<sup>6</sup> This is a publication of the IMD/World Economic Forum.

<sup>7</sup> Put another way, the data that we use have different problems to the data previously used in the literature. Thus, we view this paper as complementing Lazear’s approach with “hard” data.

employment at given wages in a simple dynamic economy. The intuition is that a firm subject to a positive shock will hire less workers than otherwise, but that firms subject to a negative shock will be less prone to firing. Thus, employment fluctuations are dampened, but average employment may be unchanged. The evidence he presents is based on Emerson (1988) and is consistent with this view. Bentolila and Bertola (1990) present a model where firing costs actually increase long-run employment.

On the other hand, Hopenhayn and Rogerson (1993) study a general equilibrium model with entry and exit of firms and calibrate it using data on firm level dynamics. They show that a tax on job destruction equal to 1 year's wage reduces the employment rate by roughly 2.5%. There are very large welfare costs in their model: The cost of the same tax in terms of consumption is over 2%. The effects of firing costs on investment are also studied by Risager and Sorensen (1997) using Bertola's model. A recent paper by Alvarez and Veracierto (1998) extends Hopenhayn and Rogerson (1993) by introducing frictions in a world without perfect insurance markets. They find that severance payments can increase welfare. The reduction in firm layoffs and the increase in the agents' search efforts (because employment is more desirable) reduce unemployment enough to compensate for lower consumption levels (productivity also falls). Other contributions in the search literature have emphasized different effects of firing restrictions (for a general treatment, see Pissarides (1990); see Mortensen and Pissarides (1999a, b) for a review). Boeri (1998), for example, presents a model where job security provisions, job-to-job shifts and long-term unemployment can coexist. Another paper by Garibaldi (1998) studies how firing restrictions reduce the volatility of job destruction and the amount of job reallocation, with unemployment remaining approximately constant. Interestingly, the effect of firing restrictions on labor force participation is theoretically ambiguous. Such restrictions could lead to higher participation rates if unproductive workers, who would otherwise exit the labor force, are locked into jobs. But they could lead to lower participation if labor supply decisions are made at the household level and a match that is more secure for one member leads other members to stop or postpone their job search activities (see, for example, Pissarides (2001) for a model that gives an insurance role to employment protection in the absence of perfect insurance markets). Saint Paul (1996a) developed a matching model to study the interaction of technological advances with firing costs in the determination of unemployment, while Saint Paul (1997) studies the effect of higher firing restrictions on a country's competitiveness and pattern of trade. Saint Paul also pioneered the study of the determinants of firing restrictions, a topic to which we will return in Section 3.2 (see Saint Paul (1996b) for a review, and Saint Paul (2002) for a compelling model; see also Wright (1986), Di Tella and MacCulloch (2000, 2002) and Hassler et al. (1999) for work on unemployment insurance).

A recent paper by Bertola and Rogerson (1997) shows that we can have similar rates of job creation and destruction across countries despite there being very different degrees of labor market flexibility, if other institutions lead to wage compression. Thus, lower flows due to job security provisions, the argument goes, could be compensated by higher employer-initiated job turnover originating in the generosity of the European welfare state. Thus, the paper points to the importance of controlling for the generosity of the welfare state when investigating the effects of flexibility on the workings of the

labor markets. All regressions in our paper include the new summary measure of the parameters of the unemployment benefit system compiled by the *OECD Jobs Study* (1994).<sup>8</sup>

## 2.2. Empirical strategy

In order to study the effect of hiring and firing restrictions on the performance of the labor market, we estimate regressions of the form

$$VAR_{it} = \alpha_1 + \alpha_2 Flexibility_{it} + \alpha_3 Benefit_{it} + \mu_i + v_t + \varepsilon_{it}, \quad (1)$$

where  $VAR$  represents the variables of interest. For purposes of comparison with Lazear's results, in the main tables these are the employment rate, the rate of participation in the labor force, the average number of hours worked in manufacturing and the unemployment rate. We also study the effect of flexibility on the proportion of long-term unemployed in the unemployment pool, the vacancy rate and the inflow rate. Variables are defined in Appendix A.

The estimation strategy we use follows Lazear's approach of using a parsimonious reduced form specification. We also show the results of different specifications, rather than committing to one early on. The main differences with Lazear's estimation strategy are that: (1) We do not impose the restriction of a quadratic time trend but report regressions controlling for year fixed effects (i.e. we include year dummies instead of the time trend and the time trend squared used by Lazear); (2) we control in all our regressions for the generosity of the welfare state (as proxied by unemployment benefits); and (3) we report regressions where lagged variables are included since firing costs are sometimes expected to affect the flows (but not directly the stocks) in the labor market.

## 2.3. Construction of the data set

The indicator of labor market flexibility used in this paper comes from the WCR, a publication of the EMF foundation in Geneva. It covers 21 countries (a list is given in Appendix A) and covers the period 1984–1990. Thus, the first year for which we have data is also the last year covered by the Lazear study. The WCR was used before by economists studying investment and growth (De Long and Summers, 1991) and studying corruption and competition (Ades and Di Tella, 1999), but its use as a source of labor market flexibility data is new. It consists of yearly surveys conducted amongst

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<sup>8</sup> It is calculated as the pre-tax average of the replacement ratios for two earnings level, three family situations and three durations of unemployment. Although not perfect, the data begin to address some of the criticisms raised by Atkinson and Micklewright (1991) to the data previously used in the literature. A number of studies have found evidence that unemployment benefit generosity increases unemployment at the micro level (e.g. Katz and Meyer, 1990). Cross-country panel studies, on the other hand, have failed to uncover significant effects of unemployment benefits on the unemployment rate, once country and year fixed effects have been included. One of the potential reasons is that the benefit data used are very poor. For example, Layard et al. (1991) uses the 1985 duration of unemployment benefits as an indicator of generosity for the whole sample.

chief executive officers and economic leaders in the countries covered, who are mailed a questionnaire containing a large number of questions on their country's competitiveness (unfortunately sometimes it can contain as many as 90 questions). The surveys were sent out to "*Company CEO's, economic and financial experts, bankers, heads of foreign owned subsidiaries of multinational companies, as well as key personalities of the economic press, trade unions and business associations*".

The survey question that is used (classified as 2.17 *LABOR-COST FLEXIBILITY* in 1984) asked the respondents: "*Flexibility of enterprises to adjust job security and compensation standards to economic realities: 0 = none at all, to 100 = a great deal*". This question was changed in 1990 to "*Flexibility of management to adjust employment levels during difficult periods: 0 = low, to 100 = high*". It was dropped altogether in subsequent years. The survey criteria presented in the WCR constitute the average value of respondent's ratings for their respective countries. Respondents were invited to rate the performance of the country in which they resided on 91 criteria, on a scale of 1 to 6. They were "*thus presented with a choice of six values which prevented them from giving a middle value. A 1 to 3 ranking implied a negative assessment, and a 4 to 6 rating a positive one.*" The results presented in the WCR are transformations from the 1–6 to a 0–100 scale. In 1984, there were 5,500 questionnaires sent out and 1,100 were returned. In 1985, there were 7,513 questionnaires sent out and 1,598 returned. In 1986, there were 1,369 returned questionnaires and in 1988 there were 1,937 returned. In 1989, there were 12,000 questionnaires sent out to a similar sample of people of which 1,800 were returned. Finally, in 1990, there were 10,000 survey questionnaires sent out of which 1,384 were returned. The firms are not randomly selected. This has the obvious drawback of not being a truly random selection of firms but the advantage that the firms may share a common benchmark (such as the US).<sup>9</sup> There was no WCR containing 1987 data so the 1986 and 1988 observations were interpolated linearly to obtain observations for 1987.

It is clear that there is a trade-off in using survey data. The data seem to be less precisely defined than what we would ideally like. There is no survey question that is easier to interpret data on than, say, the number of months' written notice required before termination to workers with 10 years of service. On the other hand, our survey measure is more likely to capture the many dimensions that such institutional arrangements associated with employment protection laws encompass. For example, much of the impact of hiring and firing costs comes from the degree of enforcement of the different aspects of the law, such as whether or not there is rightful dismissal, or the appropriate wage/length of employment over which to calculate severance pay. It is also well known that in some countries, like France, advance notice before dismissal given orally is more important than that advance notice administered in written form.<sup>10</sup> It is easier to capture this information through survey questions registering opinions than with easy to quantify data describing the actual laws, unless it is done in

<sup>9</sup> Response rates were similar in later years. For example, in 1991 there were 12,000 questionnaires sent out of which 1,484 were returned. In 1993 WCR, there were 2,160 returns out of 10,300 questionnaires sent out, although this issue did not contain the flexibility question.

<sup>10</sup> Some people call this "fuzzy advance notice".

a very meticulous manner. Another important advantage is that the respondents have actual experience and knowledge of the workings of the labor market in question, so presumably they know the relevance, if any, of changes in the written laws. In any case, measurement error in the data would bias the regression coefficients to zero. Also note that the size of the surveys implies that the variance of the observations would be considerably lower than would be the case with, for example, individual level data.<sup>11</sup>

Another potential source of concern is the fact that the question changes in 1990, omitting any reference to changes in wages. Employers in industrial democracies rarely cut nominal wages, even in countries where it could be done in principle, like the US, so this does not strike us as particularly problematic. As a check, however, we re-estimated our regressions without 1990 and the main results do not change. For example, if we re-estimate the effect of flexibility on our main variables of interest using the LSDV specification with country and time fixed effects without the 1990 observations, we find that the results improve (in terms of size and significance) in every case. Excluding the interpolated year (1987) also improves the main results in the paper.

### 2.3.1. Cross-section validation

As with all subjective data, it is important to see if some of the survey information being used can be related to hard data. The WCR survey measure of labor market flexibility can be compared with other measures that are available for a limited cross section of countries. For example, the [OECD Jobs Study \(1994\)](#) has produced a cross-country index of the “strictness” of labor employment protection legislation for 1989. The OECD index is based on an overall assessment of the extent of regular procedural inconveniences faced by employers such as delays to the start of notice of dismissal, the amount of notice and severance pay for no-fault dismissals, and also the difficulty of dismissal. The difficulty of dismissal includes assessments of the definition of unfair dismissal, trial periods and reinstatements.<sup>12</sup> The correlation coefficient of the WCR survey measure of labor market flexibility in 1989 (where high values denote high flexibility) with the 1989 OECD indicator (where high values denote greater strictness) is  $-0.75$ . Higher levels of flexibility measured by the WCR survey responses are strongly associated with lower levels of employment protection strictness measured by

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<sup>11</sup> There were more countries covered in the questionnaire than the ones used in this study (because data on other variables of interest is lacking). For example, the 1985 data comes from 1,598 answers from 31 countries, so the average is 52. This may underestimate the average number of respondents for the countries we study in this paper as they are all OECD countries, and it is likely that more questionnaires were sent and returned to these countries than to other countries in the survey (like Mexico, Brazil, Malaysia, Thailand, Korea, etc).

<sup>12</sup> The Jobs Study (1994) notes researchers have constructed various summary indicators to describe the strictness of employment protection in each nation but that “*given the complexity of the phenomenon, summary indicators are inevitably somewhat arbitrary*” (p. 70). Norway and Sweden have relatively high rankings on the OECD scale of strictness of employment protection. This is due to, for example, legislative provisions allowing courts to order reinstatement of unfairly dismissed employees in Norway and the 6-month trial period in Sweden that must be given to dismiss a 35-year-old worker.

the OECD quantification of legal data, as we can reject the hypothesis of independence of the two variables.

A second measure of the strictness of employment protection has been produced by the International Organisation of Employers (IOE) (1988). They assessed the importance of obstacles to termination or use of regular and fixed-term contracts on a 0–3 scale across countries in 1985. Regulatory constraints were classified as insignificant (0), minor, serious or fundamental (3). The correlation coefficient of the WCR survey measure of labor market flexibility in 1985 with the 1985 IOE indicator is  $-0.59$ . Higher levels of flexibility measured by the WCR survey responses are associated with lower levels of employment protection strictness measured by the IOE, although the correlation is not as strong as before (independence can again be comfortably rejected). Lastly, we also correlate the WCR data to the index used by Bertola (1990) based on information presented in Emerson (1988), and extended in the OECD Jobs Study (1994) to cover 21 countries. The correlation coefficient is  $-0.58$  and we can reject the null of zero correlation.<sup>13</sup>

### 2.3.2. Time series validation

Recently, Saint Paul (1996a, b) has coded a number of selected events of changes in job protection legislation that have occurred in Europe over the last 25 years. He classifies each event according to whether job protection legislation has become more or less restrictive. There are 12 events that have occurred in dates and countries for which we also have WCR data. For nine of the 12 events, Saint Paul records an event with the same sign as our data would predict (we create a new variable  $\Delta Flexibility_t = Flexibility_t - Flexibility_{t-1}$ ). Thus, for three events our data disagree with Saint Paul's classification. These are: The UK in 1990 (when there was an increase in the employment duration required to benefit from unfair dismissal protection), Italy in 1987 (when there was a liberalization of determined duration contracts) and Italy in 1990 when there was an extension of unfair dismissal legislation to smaller firms. In the last two events in Italy, however, the variable  $\Delta Flexibility$  only registers very small values (5.9% and 5.8% of a standard deviation in  $\Delta Flexibility$ ).

A further concern with the WCR flexibility indicator is that, being assessments of business persons, they may be affected by how well firms are doing. Maybe when a country is in a recession managers will become aware that it is tough to adjust employment levels whereas in a booming economy managers do not recall these difficulties. Or maybe managers are just more positive all round in economic booms. We test the hypothesis that the WCR flexibility variable is correlated with a number of indicators of the business cycle and do not find evidence of such a strong correlation in any of them. For example, in Table 2 in Appendix B we study the correlation between flexibility and measures of (i) aggregate *GDP* (at constant 1985 prices), (ii) the change in *GDP* ( $\Delta GDP$ ), (iii) changes in industrial production (proxied by value-added in

<sup>13</sup> As a further check, we studied the correlation of our flexibility data with a measure of flexibility obtained by Blanchflower (1999) using micro-survey data on individual willingness to move area of residence for 1995. Again we could reject independence between this measure and our *Flexibility* index (for 1990).

industry), (iv) changes in the size of the service sector (proxied by value-added in services) and (v) changes in openness. The disaggregation of  $\Delta GDP$  into industry and service sectors is done since hiring and firing restrictions may affect these two groups differently.  $\Delta Openness$  is included as a proxy for industrial turbulence, since more open economies may be more exposed to external shocks (see Cameron, 1978; Rodrik, 1998). Pearson's correlation coefficient is reported. For example, the correlation coefficient between *Flexibility* and  $\Delta Industrial\ production$  is 0.022. It is  $-0.006$  with  $\Delta Openness$ . All the above five correlations are insignificant (so is Spearman's rho) so we cannot reject the hypothesis that the *Flexibility* variable and each of these measures of the business cycle (and industrial turbulence) are independent. Controlling for country and year fixed effects,  $\Delta GDP$  has a positive but insignificant estimated effect on *Flexibility* (it is significant at the 85% level) and  $\Delta Industrial\ production$  has a positive but insignificant effect (at the 89% level).  $\Delta Service\ sector$  and  $\Delta Openness$  also have insignificant effects. Still, the empirical section will present regression estimates where flexibility appears lagged 1 year, so the possibility of joint determination of flexibility with economic variables is reduced. We will also present regressions that control for the state of the economy (including  $\Delta GDP$  and  $\Delta Industrial\ production$ ). In regressions with country and year effects, the relationship between real wages and flexibility is negative (not positive as could be expected if *Flexibility* were just a proxy for the business cycle).

We use the recently published OECD summary measure of the parameters of the unemployment insurance system (OECD Jobs Study, 1994) as a measure of the generosity of a country's welfare state. It is calculated as the pre-tax average of the replacement ratios for two earnings levels (average earnings and two-thirds average earnings), three family situations (single, with dependent spouse and with spouse in work) and three durations of unemployment (first year, second and third years, and fourth and fifth years).<sup>14</sup> It is not weighted by the composition of unemployment in any particular place or period. These data represent a significant improvement over previous measures used. Consider the case of an unmarried worker in Norway. The worker's unemployment benefit replacement rate would be 62% in the first year, 41% in the second and third years and 14% in the fourth and fifth years. These numbers do not vary according to family circumstance. The comparable numbers for the USA would be 24%, 5% and 5%, respectively, but would increase to 26% in the first year if the worker had a dependent spouse and fall to 21% if the worker had a spouse that worked. In the second, third, fourth and fifth years unemployment benefits would be zero if the worker had a spouse that worked and 10% if the spouse was dependent. Atkinson and Micklewright (1991) have emphasized that this is a desirable feature of benefit data since cuts in one type of benefit are often offset by a corresponding increase in another type. Due to the complexity of the OECD calculations of benefit generosity, measurements were made at 2-year intervals. Consequently, observations were interpolated to obtain data for consecutive years.

<sup>14</sup> The pre-tax replacement rate is defined as benefit entitlement over previous earnings, all pre-tax.

We completed our data set with the employment rate (defined as total civilian employment divided by the population aged between 15 and 64 years old), the participation rate (defined as total civilian employment plus total unemployment divided by the population aged between 15 and 64 years) and the average number of weekly hours worked in the manufacturing sector. We also collected the unemployment rate, the rate of unfilled vacancies and the rate of long-term unemployment (defined as the number of workers who have been out of work for 6 months or more as a percentage of total unemployment). The source of these data is the Centre for Economic Performance OECD 1950–1990 updated data set compiled by Bagliano et al. (1992). Pascal Marianna at the OECD kindly provided us with the latest updated file of inflow data (the number of unemployed persons with duration less than 1 month divided by total employment).

Data definitions and summary features of the data appear in Appendix A. The raw data show that countries with more flexible labor markets have higher employment rates, lower unemployment rates and lower proportions of long-term unemployed, though the relationships are by no means monotonic.

### 3. Empirical results

#### 3.1. Basic evidence on labor market flexibility

We begin our empirical analysis by studying the effect of labor market flexibility on the employment rate. Regression (1) in Table 3A estimates the effect of *Flexibility* and *Benefits* on the employment rate using generalized least-squares random effects (Balestra–Nerlove). For purposes of comparison, Table VI on p. 716 in Lazear (1990) presents hypothesis tests where the lack of independence over time of the error term in a given country has been taken into account. Regression (1) in Table 3A shows that countries with more flexible labor markets also have higher employment rates. The effect of unemployment benefits is negative but insignificant. The estimated flexibility effect is large. If the estimated effects are taken to be causal, a 1 standard deviation increase in the flexibility of the labor market will bring about an increase in the employment rate of 1.9 percentage points, almost 20% of a standard deviation in the *Employment* variable. In other words, if France were to reform its labor market to make it as flexible as that in the United States during this period, then the employment rate would increase by 4.4 percentage points. That is, different degrees of flexibility in the labor market would account for almost 38% of the different employment rates of the US and France in the late 1980s. The estimated effect means that, going from the bottom to the top of the sample (from Spain to the US) in terms of flexibility would increase Spanish employment by almost 6.2 percentage points. In order to estimate its effect on French *GDP* per capita we note that making French labor markets as flexible as those in America would mean that total employment would increase by a large 7.6%. The magnitude of the estimated effects is perhaps surprising (and we will come back to this issue) but we note that the basic evidence is inconsistent with the predictions of Bertola (1990) and Bentolila and Bertola (1990) and are broadly consistent with the Hopenhayn and Rogerson (1993) model.

Another way to correct for the lack of independence over time of the error term in each country is to control for country fixed effects. This method has the considerable advantage of controlling for the incidence of time-invariant omitted variables that may be correlated with the other explanatory variables.<sup>15</sup> The estimators in regression (2) of Table 3A are least squares with dummy variables (LSDV). The effect of flexibility on the employment rate has a similar sign and size to that in regression (1) and is significant at the 5% level, while the coefficient on unemployment benefits is insignificant. This stands in contrast to Lazear (1990, Table V, p. 714) where the effects of severance pay on the employment rate are insignificant once he controls for country dummies. Regression (3) includes year dummies. Controlling for year fixed effects adds the requirement that a country with a higher than average flexibility reading 1 year must also experience a higher than average (for the countries) employment rate (in order for a significant coefficient to be obtained). The effect of *Flexibility* is positive and significant, though of smaller size than the previous estimates. If France were to increase the flexibility of its labor markets to American levels, its employment rate would increase by 1.6 percentage points, now only 14% of the difference in the employment rates of the two countries.<sup>16</sup> In order to express this employment gain in terms of increases in French *GDP* per capita we note that this increases French total employment by 2.8%. There are some negative effects of unemployment benefits (significant at the 9% level only).

As noted in Section 2.3, a potential objection to these results is that there is possible contamination of the data arising from the stage of the business cycle. When the economy is in recession firms are more likely to be firing than hiring and so employment protection legislation may impose binding constraints on firms. If managers' responses to our survey question are subsequently in the direction of greater inflexibility at such times, even though the parameters of the system have not changed, then the interpretation of the results would be different. Alternatively, when the economy is growing the existing employment laws may be of less consequence to firms so managers' responses may indicate a higher degree of labor market flexibility in these times. We attempt to deal with this concern by reporting regressions that control for the change in total *GDP*,  $\Delta GDP$ , in every one of our tables. The results remain almost identical (that is, the coefficient on *Flexibility* retains its size and sign at the same level of significance). For example, in regression (3), once we control for  $\Delta GDP$  the coefficient on flexibility changes from 0.053 to 0.052 and the standard error remains equal to 0.026 (reported in note b in Table 3A; see also Table 7 for further tests).

<sup>15</sup> Another reason is that we use Hausman's (1978) specification test to examine if random effects are appropriate. The test statistic for regression (1), which has a chi-squared distribution with two degrees of freedom, has a value of 4.76. The probability of obtaining a value at least as large as 4.76 is consequently 0.0923. Hence, there is some evidence that the assumption of the random effects being uncorrelated with the explanatory variables is incorrect (or that the model is misspecified). Thus, we also report regressions obtained by estimation with LSDV.

<sup>16</sup> We can get another sense of the size of this effect by going from the top to the bottom of the sample. Making the Spanish labor market as flexible as the American means adding another 2.3 percentage points to the Spanish employment rate.

Theoretical models of employment alert us to the possibility that hiring and firing restrictions affect stock variables (like the employment rate) only through its effects on the flows in and out of employment. It is possible, then, that *Flexibility* affects *Employment* with a lag, and that the lag exceeds 1 year. Regression (4) in Table 3A indicates that the 1-year lag of *Flexibility* enters positively and significantly in an employment regression controlling for country and year fixed effects, and is almost 64% larger than the contemporaneous effect estimated in regression (3). If France were to have US flexibility levels, its employment rate would increase 2.6 percentage points a year later, or 22% of the actual difference in employment rates. Using a 2-year lag also yields positive and significant estimate of the effect of flexibility on the employment rate, though the number of observations drops to 102. A virtue of these estimates is that if the flexibility data were still suspect of being contaminated by the economic atmosphere as perceived by the respondents, then this would be less likely to show up when 1- or 2-year lags are used.<sup>17</sup>

An even more stringent test for the hypothesis that flexibility affects labor market performance is to include a lagged dependent variable. Again, from a theoretical perspective, it could be argued that the long-run response of the labor market to flexibility differs in the short- and long runs, or that there exist “adjustment costs” that justify this specification. Another reason we could want to include a lagged dependent variable is that it may help proxy for slower moving omitted variables that are not captured by the controls included. At any rate, it seems natural to keep an open mind at this stage of our empirical (and theoretical) knowledge on the subject. Regression (5) in Table 3A estimates the effect of flexibility on employment controlling for unemployment benefits and lagged employment. The presence of a lagged dependent variable on the right-hand side of (5) introduces a bias when estimation is by LSDV. Perhaps the easiest way to see this is to note that first differencing the data makes the lagged dependent variable correlated with the error term. Since the bias may be particularly large when the time series dimension of the panel is short, we correct for this using the generalized method of moments (GMM) technique (see Arellano and Bond, 1991). Valid instruments are specified in each time period for the first-differenced equations. Regression (5) in Table 3A controls for year fixed effects by including year dummy variables, controls for country fixed effects by first differencing the data, and then controls for the dynamic panel data bias by instrumenting the differenced lagged dependent variable ( $\Delta y_{it-1}$ ) with lagged levels of dependent variables dated  $t - 2$  and earlier. The coefficient on *Flexibility* is still positive and significant. The size is not too different from that in regression (3).

The long-run effects are quite large now. If France were to increase the flexibility of its labor markets to the level of the US, the employment rate would increase by 1.5 percentage points. In the long run, the effect would be to increase the employment rate a full 3.6 percentage points, or 31% of the France–US employment rate gap. The effect of unemployment benefits is insignificant. Lastly, regression (6) in Table 3A includes the more general specification with lags of the dependent and independent variables. The current level of *Flexibility* is still positive and comfortably significant.

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<sup>17</sup> As we mentioned in Section 2.2, we did not find evidence of such a correlation.

The first lag of flexibility is positive but insignificant, and unemployment benefits and its lag enter significantly in the employment regression. We cannot reject equality of the unemployment benefits coefficients (in absolute value) so it seems that there is some evidence that positive changes in *Benefits* decrease the employment rate.

Theory leads us to expect different effects of job security provisions across groups, depending on their roles in the labor market.<sup>18</sup> In the next two tables, we study the effect of labor market flexibility on the employment rates of men and women. The general message of Tables 3B and C is that the estimated flexibility effects on female employment rate are larger than the corresponding effects in the labor market for males. The sign and significance of the coefficients in Table 3B are almost identical to those in Table 3A. The size of the coefficients is also very similar. This result would also seem to indicate that managers' responses to the survey question are unlikely to depend on the stage of the business cycle since under this scenario we would expect to find the similar effects for both men and women. Including  $\Delta GDP$  leaves the coefficients on *Flexibility* almost identical to their previous levels (see footnote b in Tables 3B and C). In terms of size, however, one of the most interesting differences is the estimated long-run effect of flexibility on employment of females compared to that of males. Comparison of the estimated effects in regression (5) in Tables 3B and C seem to indicate that the short-run effect of flexibility is larger for women than for men, but that in the long run they have approximately similar coefficients. If France were to increase the flexibility of its labor markets to levels comparable to those prevailing in the US, regression (5) in Table 3B predicts that there would be an increase in female employment equal to almost 1 percentage point in the short run, and a 1.6 percentage point increase in the long run. Regression (5) in Table 3C predicts that such a movement would increase the employment rate of men by over 0.36 of a percentage point in the short run, and almost 1.3 percentage points in the long run.

We also study the effect of flexibility on labor force participation. As pointed out in the theory section, the expected effect is ambiguous. In Table 4A, we again present a parsimonious, reduced form approach showing a number of different specifications. Regression (1) finds positive and significant effects of flexibility on participation rates. The effect is large: If France turns into the US in terms of flexibility, the participation rate would increase by 3.5 percentage points, over 36% of the actual difference in participation rates between the two countries. Again, in contrast to Lazear, the effect survives the inclusion of country and year dummies, the inclusion of lagged independent variables and the inclusion of a lagged dependent variable (estimated with GMM techniques). In some regressions there are negative effects of unemployment benefits.

The literature suggests some stylized facts about female labor force participation (e.g. it is lower than that for males and it is larger for single women than for married women; see Killingsworth and Heckman, (1986)). This leads us to expect that the insurance effect would be stronger for females. The idea, to put it simply, is that there

<sup>18</sup> For example, Lazear has a short section on the effects of severance pay on the labor market performance of the young.

will be higher female labor force participation when men face higher probabilities of losing their jobs (and higher accessions). Table 4B shows this is largely the case in our sample, with well-defined and positive effects of flexibility on female labor force participation. Table 4C shows that the effect of flexibility for men is weaker all round. When it is significantly different from zero, it is substantially smaller in size than female effects.

Table 5A presents unemployment regressions. Regression (1) finds that random effects estimation suggests that countries with more flexible labor markets have lower unemployment rates. The estimated effects are large. Again taking the relationship to be causal, if France were to reform its labor market to have the flexibility levels observed in the US, it would have an unemployment rate which was lower by more than 1.7 percentage points. That is, different flexibility levels would explain almost 47% of the different unemployment experiences of the two countries during the mid- to late 1980s. Regression (2) shows similar results when controlling for country fixed effects. Importantly, we do not find significant effects of flexibility on the unemployment rate in regression (3), where we control for both country and year fixed effects, although the coefficient is still negative. Using robust regression techniques to reduce the influence of outliers yields a larger, negative coefficient though still insignificant (significant at the 22% level, results available upon request). As we explained earlier, flexibility may affect labor market flows, and thus could affect the unemployment rate with a lag. Regression (4) finds that an increase in flexibility today would only decrease the unemployment rate next year. The effect of flexibility lagged is significant at conventional levels and its size is almost 10% smaller (in absolute terms) than that in regression (2). Regressions (5) and (6) in Table 5A include a lagged dependent variable and only find very weak negative effects of flexibility on unemployment.

A number of economists have predicted adverse effects of inflexible labor markets on the composition of unemployment (e.g. McCormick, 1991). Table 5B studies long-term unemployment. Regressions (1) and (2) show that countries with more flexible labor markets are associated with a lower proportion of long-term unemployed in the unemployment pool when estimation is by random effects and LSDV (country dummies only). Given the effects of flexibility in other regressions, the coefficients are rather small. If the relationship is taken as causal, regression (2) predicts that if France were to reform its labor market in order to match US flexibility levels, the proportion of long-term unemployed would fall 4.6 percentage points, almost 9% of the long-term unemployment gap between the two countries. When we also include year dummies in Eq. (3), the coefficient on flexibility becomes insignificant (though still negative). The lagged specification used in Eq. (4) finds some evidence of negative effects of flexibility, significant only at the 7% level. Re-estimation of regression (3) with robust regression techniques to control for the influence of outliers yields a much higher coefficient on flexibility in absolute value ( $-0.191$ , s.e.  $0.072$ ), significant at the 1% level. The same is true when regression (4) is re-estimated with robust regression techniques, where the negative coefficient on the lag of flexibility is now significant at the 1% level. Regressions (5) and (6) do not find strong contemporaneous effects. There is some evidence of lagged effects of flexibility on long-term unemployment in Eq. (6) though the number of observations drops as low as 89.

### 3.2. Causality and non-linearities

It has been pointed out, however, that unemployment may cause changes in labor market institutions (see Lazear (1990) and Saint Paul (1996a, b, 2002) on flexibility and Wright (1986), Atkinson (1990), Di Tella and MacCulloch (2000, 2002) and Hassler et al. (1999) on unemployment benefits). Thus, there may be a simultaneity bias in the flexibility coefficient in unemployment regressions. Lack of suitable instruments leads us to focus on timing to shed at least some light on these issues. If causation runs from say, unemployment to flexibility, we would expect previous experience with unemployment to predict movements in labor market flexibility. The fact that we are working with only seven time periods, however, reduces the usefulness of examining Granger-causality for individual countries. Thus, we first run a panel regression of  $\Delta Flexibility_t$  on unemployment lagged, employment lagged and participation rate lagged (this is the specification used in Lazear (1990); see Table IX). None of the coefficients are significant. The same is true if we restrict attention to unemployment. This is shown in regressions (1) and (2) in Table 6A. Comparing regressions (2) and (3), we can see that flexibility lagged is a somewhat better predictor of the change in unemployment than unemployment lagged is a predictor for the change in flexibility, though the effect is not strong. It is also interesting to run separate unemployment and flexibility regressions on unemployment and flexibility lagged once, and unemployment and flexibility lagged twice. The effects are again more supportive of the idea that flexibility causes unemployment than the other way around. Thus, the evidence reported in Table 6A, based on the extremely limited data available for this type of exercise, is not supportive of the reverse causality hypothesis.

We also made an attempt to instrument for *Flexibility* in both the employment and participation rate regressions. The instrument chosen was *Right Wing* politics. This variable that we constructed is meant to capture the degree to which political preferences in the country lean towards the right. It is similar to those employed by political scientists to indicate the left/right position of a government and is constructed in two steps. In the first step, we collect the number of votes received by each party participating in cabinet and express them as a percentage of the total votes received by all parties with cabinet representation. This percentage of support is then multiplied in the second step by a left/right political scale (from Castles and Mair, 1984) and summed across all the cabinet parties to give a continuous variable. A shift to more *Right Wing* government leads to significantly more *Flexibility*. Using this instrument in a two-stage least-squares regression, the coefficient on *Flexibility* in the employment rate equation becomes equal to 0.23, significant at the 10% level (using the same specification as in column (3) of Table 3A). In the participation rate equation, the coefficient on *Flexibility* becomes equal to 0.26, significant at the 5% level (using the same specification as in column (3) of Table 5A).

Lazear suggests that the effect of flexibility in the labor market may be non-linear. He suggests that, once employment restrictions are severe enough, firms may stop firing workers. Unlike Lazear, we find some evidence favoring a specification that includes a quadratic *Flexibility* term, particularly in the female sub-sample with respect

to employment and participation rates. The female employment regression is included in Table 6A as an illustration (see Eq. (6)).

### 3.3. Adding more controls

Another source of potential concern is that the level of unemployment benefits is the only control included in our regressions. Although Lazear (1990) runs, essentially, univariate regressions, there is a large literature that studies the role of labor market institutions in shaping unemployment (see, for example, Phelps, 1994). Table 6B presents regressions where some of the variables identified in this literature are included as controls. Information is available for only 1 year on some of these variables (e.g. home ownership) when we also have the flexibility data. Thus, we concentrate on regressions that control for random effects.

Regression (1) in Table 6B presents an employment regression similar to the first regression in Table 3A with three extra controls: union coverage, decentralization and home ownership. *Union Coverage* is defined as the percentage of workers covered by collective agreements. In some countries, like France or Spain, this number can be significantly larger than union density (source is Appendix 1.4 in Layard et al., 1991). *Decentralization* refers to the level at which wage bargains occur (the source is a ranking constructed by Calmfors and Driffill (1988)). *Home Ownership* is the percent of households that are owner occupied in 1990 (census data, see Oswald, 1996). The basic result is that the coefficient on *Flexibility* is still positive, comfortably significant and of almost identical size as that in regression (1) in Table 3A. The other variables also enter the regression with the expected sign and are often significant (the exceptions are unemployment benefits and home ownership). In terms of comparative size the effect is only moderate. In an average year, it explains about 26% of the employment difference between Spain and the US, which is less than what the gap in the *Union* and *Decentralization* variables between the two countries can explain. The rest of Table 6B shows that including these three controls does not change the results we obtained earlier with respect to participation rates, unemployment rates and proportion of long-term unemployment in the unemployment pool. The same is true when we study females separately from males (results available on request).

Table 6C provides more robustness tests, but now adding measures of labor taxation. The former variable was the focus of the study by Daveri and Tabellini (2000) about how taxes affected employment outcomes. Our regressions include a full set of country and year fixed effects which means that we are now unable to identify effects of variables for which we do not have time series information (such as home ownership). Comparable results using our base specifications are found in column (3) in Tables 3A, 4A and 5A. For example, in the employment rate regression the coefficient on *Flexibility* changes from 0.053 in Eq. (3) in Table 3A to 0.050 in Eq. (1) in Table 6C, once the fuller set of controls has been added. In the participation rate regression, the coefficient on *Flexibility* changes from 0.059 in Eq. (3) in Table 4A to 0.044 in Eq. (2) in Table 6C with the fuller set of controls. The significance level of *Flexibility* is 6% in the employment regression and 5% in the participation regression. There also exists a negative and significant effect of *Employment taxes* on both employment

and participation (at the 5% level). A one standard deviation increase in employment taxes (equivalent to adding 10.6 percentage points onto employers' contributions as a proportion of total employee compensation) is expected to decrease the employment rate by 0.6 of 1 standard deviation (or 6.1 percentage points) and the participation rate by 0.7 of 1 standard deviation (or 6.4 percentage points). These results all remain robust to controlling for the state of the economy, such as by the inclusion of a term for  $\Delta GDP$  (reported in the footnotes) as well as terms for  $\Delta Industrial\ production$  and  $\Delta Service\ sector$ .<sup>19</sup>

Regressions (4)–(6) add interaction terms between *Flexibility* and *Employment taxes* as well as between *Benefits* and *Employment taxes*. There is no evidence of strong interaction effects in the case of *Flexibility*, but some evidence that the effect of *Employment taxes* is more negative in the presence of high unemployment benefits. We also experimented with controls for openness, terms of trade (i.e. ratio of average value of exports to average value of imports) and measures of the government's budget surplus/deficit. With these three extra controls added (as well as the four control variables included above plus the two interaction terms), the coefficient on *Flexibility* equalled 0.111 in the employment rate regression and 0.097 in the participation regression, both significant at the 5% level.

Table 7 reports results when the state of the economy, proxied by both  $\Delta GDP$  and  $\Delta Industrial\ production$ , are included together with interaction effects, as suggested by a referee. If managers tend to stress severance costs when the economy is in a downturn, then the effect of regulation could be overestimated. One way to test for this is to interact the size or sign of  $\Delta GDP$  and  $\Delta Industrial\ production$  with the *Flexibility* index. Regressions (1) and (2) include both  $\Delta GDP$  and its interaction with *Flexibility* in employment and participation rate regressions, respectively. The results remain similar to before. For example, *Flexibility* has a positive effect on the employment rate equal to 0.051, significant at the 5% level, in regression (1). The interaction term is positive but insignificant. Since hiring/firing costs may affect the industrial sector in particular, regressions (3) and (4) include  $\Delta Industrial\ production$ , interacted with *Flexibility*. The basic results again remain similar. When the sign (i.e. positive or negative) of the growth rate in industrial production is interacted with *Flexibility*, the coefficient on *Flexibility* remains significant at the 5% level in both the employment and participation regressions (equal to 0.056 and 0.065, respectively). Regressions (5) and (6) test robustness using the change in openness (as our proxy for industrial turbulence) with similar results.

### 3.4. Other hypothesis on the consequences of labor market flexibility

Following the work of Davis and Haltiwanger (1990), there has been growing interest in the profession on the empirical behavior of job creation and job destruction. We were unable to obtain comparable cross-country measures of these variables. We did, however, obtain a measure of unfilled vacancies divided by total employment from the CEP-OECD data set (that in turn collects it from the OECD main economic indicators)

<sup>19</sup> All results reported in the paper but not included in the tables are available on request.

which is as close as we can get to a measure of job creation. And Pascal Marianna at the OECD kindly provided us with the unpublished data for inflows revised in 1998.<sup>20</sup> In Table 8A and B, we study the effect of flexibility on these variables. In spite of some inconsistencies, the results are interesting. For example, regression (1) in Table 8A shows that the pooled data reveal a very strong positive association between inflows and flexibility. However, estimation by random effects makes the coefficient insignificant (and negative). In fact, when country dummies are included in regression (3) the effect of flexibility on inflows is negative and significant. This result does not survive re-estimation with robust regression techniques or the inclusion of year dummies in regression (4).

Regression (5) shows low persistence of inflows and some positive effects of unemployment benefits. The last two regressions in Table 8A control for the state of the business cycle (proxied by the change in *GDP*). As expected there are fewer inflows during expansions. Regression (7) examines if the evidence supports the hypothesis that the relationship between the business cycle and inflows is affected by flexibility by including an interaction term ( $\Delta GDP * Flexibility$ ). The estimated interaction effect has the expected sign but is insignificant. With respect to vacancies, there are again some inconsistencies. Regression (4) in Table 8B shows that, controlling for both country and time fixed effects, countries with higher levels of labor market flexibility have less unfilled vacancies.<sup>21</sup> Presumably, this indicates that in flexible labor markets vacancies are filled more quickly. In regression (6) we find that, somewhat reassuringly, there are more vacancies in a recovery and that there are well-defined negative effects of flexibility on vacancies. Column (7) shows that there are more vacancies in a recovery that occurs in a country with high flexibility (due to the positive interaction term).

Lastly, in Table 9 we examine two other hypotheses that have been proposed in the literature. The first is the jobless recovery hypothesis; the idea that in more inflexible labor markets Okun's law has to be adjusted downwards. Bertola 1990 shows that cross-section evidence is consistent with this view. In order to examine the evidence on these issues, we present regressions (1) and (2) in Table 9 where the dependent variable is the change in the unemployment rate. Regression (1) shows the basic relationship between  $\Delta Unemployment$  and  $\Delta GDP$ , once we control for country and time fixed effects. Regression (2) shows that the interaction term ( $\Delta GDP * Flexibility$ ) is negative and significant at the 10% level, indicating that when *GDP* increases, unemployment falls more in countries with more flexible labor markets.

Second, we test the hypothesis that unemployment persistence is greater in countries with more inflexible labor markets. This hypothesis has been suggested, in one form or another, by Blanchard and Summers (1986) and Lindbeck and Snower (1989). It is also examined in Bertola (1990) who finds evidence consistent with this hypothesis. To test this proposition, we allow for the coefficient on the lagged dependent variable in standard unemployment regressions to vary with the degree of flexibility. In Table 9,

<sup>20</sup> We interpolated four values of inflows, Netherlands 1984 and 1986 and Finland 1988 and 1990. The results do not change if these observations are excluded.

<sup>21</sup> Normalizing by unemployment (instead of employment) produces largely similar results.

regression (3) includes an interaction term,  $Unemployment_{t-1} * (1 - Flexibility_{t-1})$ , which is positive and significant at the 2% level.<sup>22</sup> In other words, more inflexibility (i.e. corresponding to greater values of  $1 - Flexibility_{t-1}$ ) is associated with a larger coefficient on the lagged dependent variable. Using the coefficients of regression (3), the United States would have a coefficient on lagged unemployment of  $0.596 + 0.462 * (1 - 0.727) = 0.72$ , ceteris paribus (mean flexibility over the sample period equals 0.727 in the US). On the other hand, France would have a coefficient on lagged unemployment of  $0.596 + 0.462 * (1 - 0.423) = 0.86$ , ceteris paribus (mean flexibility over the sample period equals 0.423 in France). Furthermore, as we move from the most flexible country in the sample (the US) to the least flexible country (Spain), the coefficient on lagged unemployment is estimated to rise from 0.72 to 0.92 ( $= 0.596 + 0.462 * (1 - 0.298)$ , since mean flexibility over the sample period equals 0.298 in Spain). Regression (4), which is estimated using GMM, shows a similar effect, with the interaction term again positive and significant at the 2% level. The effect on the coefficient of lagged unemployment of changing the level of flexibility is now larger than in regression (3). A decrease in flexibility equivalent to a shift from the US to France is expected to add 0.25 ( $= 0.820 * (0.727 - 0.423)$ ) onto the size of the coefficient on lagged unemployment. Thus, the evidence is consistent with the hypothesis of Blanchard and Summers (1986), and Lindbeck and Snower (1989), as there seems to be less unemployment persistence in flexible labor markets.<sup>23</sup>

#### 4. Conclusion

One of the biggest challenges in economics today is to explain what causes unemployment. Economists who study European unemployment often point out that it must be labor market regulations. This view has been adopted by international institutions like the World Bank and the IMF, which now insist that countries make their labor markets more flexible when providing them with financial support. The evidence available to support this view consists of cross-sections, like that of Bertola (1990) with 10 countries, or the OECD (1994) with 21, and the panel constructed by Lazear (1990). Because the latter focuses on laws for two aspects of flexibility that change little over time, these data are almost like another cross-section. There is, perhaps, no experience more sobering to an economist than to review the evidence we have to support policy recommendations on labor market flexibility and to reflect on the social, economic and personal costs of unemployment.

We introduce a new panel data set on labor market flexibility based on surveys of business people in 21 OECD countries during 1984–1990. One of the virtues of the data is that they originate from people who have to make their living out of roughly understanding how stringent job security provisions actually are in their countries. The

<sup>22</sup> This regression is illustrative. Caution should be exercised when using the absolute values of these coefficients because of the bias in short panels with lagged dependent variables.

<sup>23</sup> Furthermore, the argument that managers' responses to the flexibility survey question may depend on the stage of the business cycle would not seem to be able to explain this persistence effect.

use of a subjective index allows respondents to capture movements in very different kinds of regulations that affect the flexibility of labor markets, such as provisions on part time work, severance payments, interpretation (and enforcement) of what constitutes legal cause for termination and so on. These regulations imply very different costs to normal business operations and would be extremely difficult to document with hard data. There are, of course, limitations to the data we use. The index is more vague than what an economist would ideally like to use. By its nature, our flexibility index does not allow us to distinguish between the effect of the different regulations that are active. And although we present some time series/cross-section validation exercises, the fact must remain that data that are subjective in nature must be treated with care. However, we believe the relevance of the subject matter and the evidence available to the profession to be so out of balance that a willingness to experiment with survey data is justified.

We follow Lazear (1990) and use a parsimonious, reduced form approach to study the effect of flexibility on labor market performance. Our main findings are:

1. Controlling for country and time fixed effects, and using dynamic panel data techniques developed by Arellano and Bond (1991), we find that countries with more flexible labor markets have higher employment rates and higher rates of participation in the labor force. The results on employment are inconsistent with Bentolila and Bertola (1990) and Bertola (1990) and are consistent with the predictions in Hopenhayn and Rogerson (1993).
2. These results are stronger in the female labor market, although the long-run effects are approximately similar across both male and female sub-groups.
3. A potential drawback of these data is their contamination by the stage of the business cycle. When the economy is in recession firms are more likely to be firing than hiring and so employment protection legislation may impose binding constraints on firms. If managers' responses to our survey question were in fact in the direction of greater inflexibility at such times, even though the parameters of the system have not changed, then the interpretation of our results would be different. Consequently, we repeated all our regressions controlling for the state of the business cycle (the change in *GDP*). The results are unaffected. We also note that it would be hard to explain some of our coefficients if the contamination of the flexibility data with the business cycle was the main factor driving our results.
4. The estimated employment effects seem to be large. A conservative estimate is as follows: if France were to increase the flexibility of its labor markets to US levels, the employment rate would increase by 1.6 percentage points, almost 14% of the actual difference in employment rates between the two countries. In order to estimate the effect of flexibility on French *GDP* per capita, we note that this increase in flexibility would lead to a 2.8% increase in French total employment. Of course, this says nothing about the convenience of such a reform. For that we would need information on the benefits (in terms of employment security, wages and so on) of flexibility, a fact sometimes forgotten in policy debates.
5. The paper only finds some evidence that countries with more flexible labor markets have lower unemployment rates and a lower proportion of long term unemployed.

The problem of the endogeneity of labor market institutions is addressed but still must remain an open issue.

6. In spite of some inconsistencies, the results on inflows and vacancies are interesting. Controlling for country and year fixed effects, we do not find evidence of positive effects of flexibility on inflows. We do however find evidence that more flexibility is associated with lower rates of unfilled vacancies and that there are more vacancies in a recovery that occurs in a country with high flexibility.
7. Lastly, we explore some alternative hypotheses related to flexibility that have been suggested in the literature. First, we examine the jobless recovery hypothesis. We find evidence that Okun's law is steeper in countries with very flexible labor markets (as suggested in Bertola, 1990). We also find evidence consistent with a second hypothesis tested by Bertola and suggested by Blanchard and Summers (1986) and Lindbeck and Snower (1989): that the dynamic structure of unemployment regressions is affected by flexibility. Controlling for country and time fixed effects, we find that unemployment is less persistent in countries with more flexible labor markets.

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## Appendix A

### A.1. Sample of 21 countries

Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

### A.2. Definition of the variables

*Employment*: Total civilian employment divided by the population aged between 15 and 64 years old. From the updated CEP-OECD data set.

*Male employment*: Total civilian male employment divided by the population aged between 15 and 64 years old. From the updated CEP-OECD data set.

*Female employment*: Total civilian female employment divided by the population aged between 15 and 64 years old. From the updated CEP-OECD data set.

*Participation*: Total civilian employment plus total unemployment divided by the population aged between 15 and 64. From the updated CEP-OECD data set.

*Male participation*: Total civilian male employment plus total male unemployment divided by the population aged between 15 and 64. From the updated CEP-OECD data set.

*Female participation*: Total civilian female employment plus total female unemployment divided by the population aged between 15 and 64. From the updated CEP-OECD data set.

*Unemployment*: The unemployment rate, defined as the total number of unemployed workers divided by the total number of both employed and unemployed workers, from OECD Historical Statistics (1997).

*Long-term unemployment*: The number of workers who have been out of work for 6 months and more as a percentage of total unemployment, from the OECD Employment Outlook (1985–1991).

*Benefits*: The OECD summary measure of parameters of the UI system. To calculate this measure, the situation of a representative individual is estimated using their unemployment benefit entitlements divided by the corresponding wage. Consequently, the unweighted mean of 18 numbers based on the various combinations of the following scenarios is determined (1) three unemployment durations (for persons with a long record of previous employment)—the first year, second and third years, and fourth and fifth years of unemployment, (2) three family and income situations: a single person, a married person with a dependent spouse, and a married person with a spouse in work; (3) two different levels of previous earnings – average earnings and  $\frac{2}{3}$  of average earnings (see OECD Jobs Study, 1994).

*Flexibility*: The survey question that we use (classified as 2.17 *LABOR-COST FLEXIBILITY* in 1984) asked the respondents: “*Flexibility of enterprises to adjust job security and compensation standards to economic realities: 0 = none at all, to 100 = a great deal*”. This question was changed in 1990 to “*Flexibility of management to adjust employment levels during difficult periods: 0 = low, to 100 = high*”. From the WCR, EMF Foundation, Cologne/Geneva.

*Inflow rate*: Number of people unemployed less than one month divided by the employed. Updated by the OECD in 1998. Unpublished.

*GDP*: The log of total *GDP* expressed in constant 1985 prices, from the updated CEP-OECD data.

*Openness*: Exports over *GDP* from the updated CEP-OECD data set.

*Industrial production*: The log of the total value added in industry expressed in constant 1985 prices, from OECD Historical Statistics (1997).

*Service sector*: The log of the total value-added in the service sector expressed in constant 1985 prices, from OECD Historical Statistics (1997).

*Employment taxes*: Employers’ total employment tax contributions divided by the total compensation of employees (net of employment taxes), from the updated CEP-OECD data set.

*Terms of trade*: Ratio of average value of exports to average value of imports (from OECD Historical Stats).

## Appendix B

Description of various data for 21 countries for the period 1984–1990 are given in Table 1 and correlation between flexibility and indicators of business cycle (1984–1990) is given in Table 2.

Table 1  
Description of the data: 21 Countries, averages for 1984–1990

<i>Country</i>	<i>Flexibility</i>	<i>Benefits</i>	<i>Employment</i>	<i>Unemployment</i>	<i>LTU</i>
Australia	38.45	0.24	0.66	0.08	0.47
Austria	41.29	0.29	0.64	0.03	—
Belgium	41.83	0.44	0.54	0.11	0.85
Canada	56.90	0.28	0.68	0.09	0.23
Denmark	61.76	0.52	0.76	0.07	0.51
Finland	50.11	0.34	0.73	0.05	0.30
France	42.33	0.36	0.58	0.10	0.65
Germany	41.49	0.28	0.62	0.07	0.65
Ireland	47.57	0.29	0.51	0.16	0.80
Italy	39.87	0.01	0.52	0.11	0.85
Japan	55.43	0.09	0.71	0.03	0.39
Netherlands	46.70	0.53	0.55	0.10	0.67
Norway	40.89	0.38	0.75	0.03	0.19
New Zealand	40.95	0.27	0.67	0.05	0.32
Spain	29.81	0.34	0.45	0.19	0.74
Sweden	40.77	0.28	0.80	0.02	0.22
Switzerland	61.69	0.21	0.75	0.01	—
UK	58.08	0.19	0.67	0.09	0.61
USA	72.66	0.12	0.69	0.06	0.14
Greece	30.28	0.09	0.55	0.08	0.67
Portugal	33.12	0.27	0.65	0.07	0.66

*Note:* *Flexibility* is presented as in the WCR, on a 0–100 scale. In Table 3A onwards, the data have been scaled down by a factor of 100 (to lie on a 0–1 scale).

Table 2  
Correlation coefficients between flexibility and indicators of the business cycle, 1984–1990<sup>a</sup>

	<i>Flexibility</i>	<i>GDP</i> per Capita	$\Delta$ <i>GDP</i> per Capita	$\Delta$ <i>Industrial</i> <i>production</i>	$\Delta$ <i>Service</i> <i>sector</i>
<i>Flexibility</i>	1				
<i>GDP</i> per capita	0.013	1			
$\Delta$ <i>GDP</i> per capita	0.014	−0.071	1		
$\Delta$ <i>Industrial production</i>	0.022	−0.023	0.601	1	
$\Delta$ <i>Service sector</i>	−0.078	−0.112	0.659	−0.127	1
$\Delta$ <i>Openness</i>	−0.006	0.076	−0.161	0.003	−0.224

<sup>a</sup>Based on 126 observations.

## Appendix C

Determinants of the employment rates of 21 OECD countries for the period 1984–1990 are given in Table 3. Determinants of different participation rates for 21 countries (1984–1990) are given in Table 4. Table 5 describes unemployment rates for these countries for the same period. For these countries, Table 6 estimates casualty and non-linear effects, random effect and fixed effects. Table 7 describes determinants of employment and participation, controlling for response bias. Table 8 describes inflow rate and vacancies, while Table 9 gives Okun's law and unemployment persistence.

Table 3

The determinants of the employment, female employment and male employment rates: 21 OECD countries, 1984–1990<sup>a</sup>

	(1) Random effects	(2) LSDV	(3) LSDV <sup>b</sup>	(4) LSDV	(5) GMM	(6) GMM
<b>(A) Employment rate</b>						
<i>Employment<sub>t-1</sub></i>					0.582** (0.074)	0.436** (0.071)
<i>Flexibility</i>	0.144** (0.022)	0.141** (0.022)	0.053** (0.026)		0.050** (0.013)	0.033** (0.009)
<i>Flexibility<sub>t-1</sub></i>				0.087** (0.029)		0.001 (0.009)
<i>Benefits</i>	-0.041 (0.071)	-0.057 (0.081)	-0.129* (0.075)		-0.037 (0.044)	-0.292** (0.097)
<i>Benefits<sub>t-1</sub></i>				-0.013 (0.077)		0.221** (0.065)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	144	144	144	123	123	102
Adj <i>R</i> <sup>2</sup>	0.19	0.97	0.97	0.98	0.16	0.24
<b>(B) Female employment rate</b>						
<i>Employment<sub>t-1</sub></i> (female)					0.399** (0.036)	0.260** (0.047)
<i>Flexibility</i>	0.120** (0.014)	0.119** (0.014)	0.052** (0.015)		0.032** (0.005)	0.028** (0.005)
<i>Flexibility<sub>t-1</sub></i>				0.053** (0.016)		0.007 (0.006)
<i>Benefits</i>	-0.032 (0.046)	-0.056 (0.051)	-0.113** (0.043)		-0.060** (0.024)	-0.216** (0.064)
<i>Benefits<sub>t-1</sub></i>				-0.041 (0.043)		0.102** (0.035)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes

Table 3 (continued)

	(1) Random effects	(2) LSDV	(3) LSDV <sup>b</sup>	(4) LSDV	(5) GMM	(6) GMM
No. of observations	144	144	144	123	123	102
Adj $R^2$	0.17	0.97	0.98	0.98	<i>0.24</i>	<i>0.21</i>
<i>(C) Male employment rate</i>						
<i>Employment<sub>t-1</sub> (male)</i>					0.711** (0.069)	0.597** (0.065)
<i>Flexibility</i>	0.025** (0.011)	0.022** (0.011)	0.001 (0.014)		0.012** (0.004)	0.006 (0.005)
<i>Flexibility<sub>t-1</sub></i>				0.033** (0.016)		0.011* (0.006)
<i>Benefits</i>	-0.015 (0.033)	-0.001 (0.039)	-0.016 (0.040)		0.034** (0.017)	-0.004 (0.046)
<i>Benefits<sub>t-1</sub></i>				0.027 (0.041)		0.020 (0.040)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	144	144	144	123	123	102
Adj $R^2$	0.17	0.95	0.95	0.96	<i>0.29</i>	<i>0.15</i>

Notes: LSDV is least squares with dummy variables and GMM is generalized method of moments. For the GMM regressions, the Sargan test for the validity of the orthogonality conditions is reported (in italics) in place of the Adj  $R^2$ . The WCR flexibility data have been scaled down by a factor of 100 to lie on a 0–1 scale.

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10% level.

\*\*Denotes significance at the 5% level.

<sup>b</sup>If we also control for  $\Delta GDP$  in column (3) of Table 3(A) the coefficients (standard errors) on *Flexibility*, *Benefits* and  $\Delta GDP$  are 0.052 (0.026), -0.106 (0.080) and -0.084 (0.097), respectively. The corresponding coefficients (standard errors) in column (3) of Table 3(B) on *Flexibility*, *Benefits* and  $\Delta GDP$  are 0.051 (0.015), -0.090 (0.045) and -0.083 (0.055), respectively, and in column (3) of Table 3(C) they are 0.001 (0.014), -0.016 (0.043) and  $-3.2e - 4$  (0.052), respectively

Table 4

The determinants of the participation, female participation and male participation rates: 21 OECD countries, 1984–1990<sup>a</sup>

	(1) Random effects	(2) LSDV	(3) LSDV <sup>b</sup>	(4) LSDV	(5) GMM	(6) GMM
<i>(A) Participation rate</i>						
<i>Participation<sub>t-1</sub></i>					0.689** (0.059)	0.428** (0.057)
<i>Flexibility</i>	0.117** (0.018)	0.114** (0.018)	0.059** (0.021)		0.058** (0.007)	0.052** (0.006)
<i>Flexibility<sub>t-1</sub></i>				0.058** (0.023)		-0.007 (0.005)
<i>Benefits</i>	-0.050 (0.056)	-0.082 (0.064)	-0.139** (0.062)		0.014 (0.029)	-0.168** (0.079)
<i>Benefits<sub>t-1</sub></i>				-0.048 (0.061)		0.078* (0.045)

Table 4 (continued)

	(1) Random effects	(2) LSDV	(3) LSDV <sup>b</sup>	(4) LSDV	(5) GMM	(6) GMM
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	144	144	144	123	123	102
Adj $R^2$	0.19	0.97	0.97	0.98	0.11	0.12
<b>(B) Female participation rate</b>						
$Participation_{t-1}$ (female)					0.786** (0.036)	0.567** (0.097)
<i>Flexibility</i>	0.118** (0.013)	0.118** (0.013)	0.061** (0.015)		0.046** (0.005)	0.040** (0.005)
$Flexibility_{t-1}$				0.048** (0.016)		-0.013** (0.004)
<i>Benefits</i>	-0.043 (0.043)	-0.078 (0.079)	-0.133** (0.042)		0.002 (0.028)	-0.118** (0.046)
$Benefits_{t-1}$				0.062 (0.043)		0.052** (0.025)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	144	144	144	123	123	102
Adj $R^2$	0.13	0.97	0.98	0.98	0.12	0.08
<b>(C) Male participation rate</b>						
$Participation_{t-1}$ (male)					0.504** (0.064)	0.027 (0.071)
<i>Flexibility</i>	-8.6e-4 (0.007)	-0.004 (0.007)	-0.002 (0.010)		0.007** (0.002)	0.005 <sup>a</sup> (0.003)
$Flexibility_{t-1}$				0.010 (0.010)		0.002 (0.002)
<i>Benefits</i>	-0.011 (0.023)	-0.004 (0.026)	-0.006 (0.028)		0.022 (0.022)	-0.056** (0.023)
$Benefits_{t-1}$				0.014 (0.026)		0.020 (0.022)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	144	144	144	123	123	102
Adj $R^2$	0.01	0.96	0.96	0.97	0.34	0.35

Notes: LSDV is least squares with dummy variables and GMM is generalized method of moments. For the GMM regressions, the Sargan test for the validity of the orthogonality conditions is reported (in italics) in place of the Adj  $R^2$ . The WCR flexibility data have been scaled down by a factor of 100 to lie on a 0–1 scale.

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10% level.

\*\*Denotes significance at the 5% level.

<sup>b</sup>If we also control for  $\Delta GDP$  in column (3) of Table 4(A) the coefficients (standard errors) on *Flexibility*, *Benefits* and  $\Delta GDP$  are 0.058 (0.021), -0.103 (0.065) and -0.133 (0.078). The corresponding coefficients (standard errors) in column (3) of Table 4(B) on *Flexibility*, *Benefits* and  $\Delta GDP$  are 0.061 (0.015), -0.113 (0.045) and -0.071 (0.054), respectively, and in column (3) of Table 4(C) they are -0.003 (0.009), 0.011 (0.029) and -0.062 (0.035), respectively.

Table 5

The determinants of the unemployment, and long-term unemployment rates: 21 OECD countries, 1984–1990<sup>a</sup>

	(1) Random effects	(2) LSDV	(3) LSDV <sup>b</sup>	(4) LSDV	(5) GMM	(6) GMM
<b>(A) Unemployment rate</b>						
<i>Unemployment</i> <sub><i>t</i>-1</sub>					0.840** (0.035)	0.934** (0.039)
<i>Flexibility</i>	-0.056** (0.014)	-0.053** (0.015)	-3.5e-4 (0.019)		-0.014 (0.009)	-0.004 (0.010)
<i>Flexibility</i> <sub><i>t</i>-1</sub>				-0.048** (0.022)		-0.022* (0.013)
<i>Benefits</i>	0.050 (0.044)	-0.018 (0.054)	0.006 (0.053)		-0.004 (0.021)	-0.014 (0.030)
<i>Benefits</i> <sub><i>t</i>-1</sub>				-0.039 (0.057)		-0.030 (0.033)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	144	144	144	123	123	102
Adj <i>R</i> <sup>2</sup>	0.09	0.93	0.94	0.94	0.16	0.08
<b>(B) Long-term unemployment rate</b>						
<i>Long-term unemployment</i> <sub><i>t</i>-1</sub>					0.592** (0.078)	0.439** (0.084)
<i>Flexibility</i>	-0.170** (0.068)	-0.150** (0.069)	-0.090** (0.093)		0.011 (0.032)	0.033 (0.039)
<i>Flexibility</i> <sub><i>t</i>-1</sub>				-0.200* (0.108)		-0.073** (0.031)
<i>Benefits</i>	0.059 (0.258)	0.001 (0.356)	-0.005 (0.364)		-0.555** (0.195)	0.202 (0.292)
<i>Benefits</i> <sub><i>t</i>-1</sub>				-0.292 (0.345)		0.327 (0.200)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes	Yes	Yes
No. of observations	129	129	129	112	108	89
Adj <i>R</i> <sup>2</sup>	0.17	0.95	0.95	0.96	0.26	0.18

Notes: LSDV is least squares with dummy variables and GMM is generalized method of moments. For the GMM regressions, the Sargan test for the validity of the orthogonality conditions is reported (in italics) in place of the Adj *R*<sup>2</sup>. The WCR flexibility data have been scaled down by a factor of 100 to lie on a 0–1 scale.

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10% level.

\*\*Denotes significance at the 5% level.

<sup>b</sup>If we also control for  $\Delta GDP$  in column (3) of Table 5(A) the coefficients (standard errors) on *Flexibility*, *Benefits* and  $\Delta GDP$  are -0.001 (0.018), 0.026 (0.055) and -0.079 (0.067), respectively. The corresponding coefficients (standard errors) in column (3) of Table 5(B) on *Flexibility*, *Benefits* and  $\Delta GDP$  are 0.087 (0.093), -0.010 (0.364) and 0.371 (0.335), respectively.

Table 6

(A) Some evidence on causality and nonlinear effects: 21 OECD countries, 1984–1990<sup>a</sup>

Dependent variable	(1) $\Delta Flexibility$ LSDV	(2) $\Delta Flexibility$ LSDV	(3) $\Delta Unemp.$ LSDV	(4) $Flexibility$ LSDV	(5) $Unemp.$ LSDV	(6) $Fem. Emp$ LSDV
$Employment_{t-1}$	-6.590 (8.364)					
$Participation_{t-1}$	5.031 (7.846)					
$Unemployment_{t-1}$	-4.186 (5.900)	0.699 (1.205)		0.317 (0.833)	1.278** (0.075)	
$Unemployment_{t-2}$		0.128 (1.167)		-0.235 (1.064)	-0.716** (0.096)	
$Flexibility_{t-1}$			-0.027* (0.014)	0.105 (0.121)	-0.026** (0.011)	
$Flexibility_{t-2}$			-0.004 (0.011)	-0.168* (0.094)	-0.004 (0.008)	
$Flexibility_t$						0.172** (0.056)
$Flexibility_t$ squared						-0.0013** (5.6e-04)
$Benefits_t$						-0.151** (0.046)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	125	126	105	105	105	144
Adj $R^2$	-0.09	-0.11	0.25	0.81	0.99	0.98

(B) Other variables included; random effects: 21 OECD countries, 1984–1990<sup>a</sup>

Dependent variable	(1) $Employment^b$	(2) $Participation^c$	(3) $Unemp.^d$	(4) $Long-term unemp.^e$
$Flexibility$	0.144** (0.022)	0.116** (0.018)	-0.058** (0.015)	-0.175** (0.069)
$Benefits$	-0.072 (0.075)	-0.073 (0.060)	0.042 (0.045)	-0.106 (0.281)
$Union coverage$	-0.098** (0.039)	-0.074** (0.032)	0.044** (0.017)	0.358** (0.095)
$Decentralization$	-0.015** (0.005)	-0.011** (0.004)	0.007** (0.002)	0.036** (0.013)
$Home Ownership$	-0.114 (0.136)	-0.040 (0.113)	0.124** (0.059)	-0.431 (0.421)
No. of observations	139	139	140	122
Adj $R^2$	0.49	0.43	0.54	0.56

Table 6 (continued)

(C) Other variables included, fixed effects: 21 OECD countries, 1984–1990<sup>a</sup>

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	LSDV <i>Employ.</i> <sup>f</sup>	LSDV <i>Particip.</i> <sup>g</sup>	LSDV <i>Unemp.</i> <sup>h</sup>	LSDV <i>Employ.</i>	LSDV <i>Particip.</i>	LSDV <i>Unemp.</i>
<i>Flexibility</i>	0.050* (0.027)	0.044** (0.022)	−0.017 (0.020)	0.092** (0.046)	0.079** (0.037)	−0.028 (0.034)
<i>Benefits</i>	−0.042 (0.087)	−0.004 (0.071)	0.049 (0.063)	0.111 (0.133)	0.187* (0.107)	0.064 (0.098)
<i>Union coverage</i>	−0.095** (0.036)	−0.089** (0.030)	0.024 (0.026)	−0.065* (0.039)	−0.054* (0.032)	0.025 (0.029)
<i>Decentralization</i>	−0.012** (0.004)	−0.009** (0.004)	0.006* (0.003)	−0.009* (0.005)	−0.006 (0.004)	0.006* (0.003)
<i>Employment taxes</i>	−0.580** (0.207)	−0.603** (0.170)	0.047 (0.149)	−0.097 (0.334)	−0.034 (0.270)	0.066 (0.247)
<i>Employment taxes * Flexibility</i>				−0.149 (0.178)	−0.106 (0.144)	0.057 (0.132)
<i>Employment taxes * Benefits</i>				−1.200 (0.808)	−1.505** (0.652)	−0.128 (0.598)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	122	122	123	122	122	123
Adj R <sup>2</sup>	0.98	0.98	0.95	0.98	0.98	0.95

Notes: LSDV is least squares with dummy variables. The WCR Flexibility data have been scaled down by a factor of 100 to lie on a 0 to 1 scale. *Unemp* abbreviates the *Unemployment rate* and *Fem. Emp.* abbreviates *Female Employment*.

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10%.

\*\*Denotes significance at the 5%.

<sup>b</sup>If we also control for  $\Delta GDP$  in column (1) the coefficient (standard error) on *Flexibility* becomes 0.141 (0.022).

<sup>c</sup>Controlling also for  $\Delta GDP$  in column (2) the coefficient (standard error) on *Flexibility* becomes 0.112 (0.018).

<sup>d</sup>Controlling also for  $\Delta GDP$  in column (3) the coefficient (standard error) on *Flexibility* becomes −0.059 (0.015).

<sup>e</sup>Controlling also for  $\Delta GDP$  in column (4) the coefficient (standard error) on *Flexibility* becomes −0.166 (0.069).

<sup>f</sup>If we also control for  $\Delta GDP$  in column (1) the coefficient (standard error) on *Flexibility* is 0.050 (0.027).

<sup>g</sup>Controlling also for  $\Delta GDP$  in column (2) the coefficient (standard error) on *Flexibility* is 0.044 (0.022).

<sup>h</sup>Controlling also for  $\Delta GDP$  in column (3) the coefficient (standard error) on *Flexibility* is −0.017 (0.020).

Table 7

The determinants of employment and participation, controlling for response bias: 21 OECD countries, 1984–1990<sup>a</sup>

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	LSDV Employ. total	LSDV Particip. total	LSDV Employ. total	LSDV Particip. total	LSDV Employ. total	LSDV Particip. total
<i>Flexibility</i>	0.051* (0.030)	0.056** (0.024)	0.053** (0.027)	0.063** (0.022)	0.055* (0.031)	0.056** (0.025)
<i>Benefits</i>	-0.105 (0.081)	-0.101 (0.066)	-0.116 (0.080)	-0.116* (0.065)	-0.129* (0.076)	-0.141** (0.063)
$\Delta GDP$	-0.106 (0.334)	-0.186 (0.271)				
$\Delta GDP * Flexibility$	0.048 (0.703)	0.116 (0.571)				
$\Delta Industry\ production$			-0.068 (0.202)	0.027 (0.165)		
$\Delta Industry\ production * Flexibility$			0.039 (0.452)	-0.104 (0.368)		
$\Delta Openness$					-0.058 (0.491)	-0.040 (0.404)
$\Delta Openness * Flexibility$					-0.157 (1.034)	0.209 (0.850)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	144	144	144	144	144	144
Adj $R^2$	0.97	0.97	0.97	0.97	0.97	0.97

Notes: LSDV is least squares with dummy variables. The WCR Flexibility data have been scaled down by a factor of 100 to lie on a 0 to 1 scale.  $Sign(x)=1$  if  $x$  is positive and 0 if  $x$  is negative.

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10% level.

\*\*Denotes significance at the 5% level.

Table 8

The determinants of the inflow rate and vacancies (divided by employment): 21 OECD countries, 1984–1990<sup>a</sup>

	(1) Pooled OLS	(2) Random effects	(3) LSDV	(4) LSDV	(5) GMM	(6) LSDV	(7) LSDV
<b>(A) Inflow rate</b>							
<i>Inflow Rate</i> <sub><i>t</i>-1</sub>					0.402** (0.056)		
<i>Flexibility</i>	2.578** (0.386)	-0.189 (0.134)	-0.266** (0.130)	-0.089 (0.166)	0.006 (0.051)	-0.097 (0.163)	-0.030 (0.190)
<i>Benefits</i>	-0.594* (0.354)	0.348 (0.562)	0.954 (0.671)	1.141* (0.653)	1.768** (0.504)	1.157* (0.642)	1.271* (0.664)
$\Delta$ GDP						-1.270** (0.591)	0.404 (2.459)
$\Delta$ GDP * <i>Flexibility</i>							-3.515 (5.010)
Country fixed effects	No	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes	Yes	Yes	Yes
No. of obs	129	129	129	129	108	129	129
Adj <i>R</i> <sup>2</sup>	0.26	0.12	0.98	0.98	0.49	0.98	0.98
<b>(B) Vacancies (divided by employment)</b>							
<i>Vacancies/</i> <i>Employment</i> <sub><i>t</i>-1</sub>					0.508** (0.161)		
<i>Flexibility</i>	-0.001 (0.003)	0.005* (0.003)	0.005* (0.003)	-0.008** (0.003)	2.0e-4 (0.002)	-0.007** (0.003)	-0.013** (0.003)
<i>Benefits</i>	-0.003 (0.003)	0.003 (0.006)	0.013 (0.010)	0.007 (0.009)	-0.002 (0.009)	-0.009 (0.009)	-0.004 (0.009)
$\Delta$ GDP						0.048** (0.011)	-0.068* (0.037)
$\Delta$ GDP * <i>Flexibility</i>							0.255** (0.078)
Country fixed effects	No	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes	Yes	Yes	Yes
No. of observations	126	126	126	126	108	126	126
Adj <i>R</i> <sup>2</sup>	0.01	0.01	0.66	0.77	0.14	0.80	0.82

Note: LSDV is least squares with dummy variables and GMM is generalized method of moments. For the GMM regressions, the Sargan test for the validity of the orthogonality conditions is reported (in italics) in place of the Adj *R*<sup>2</sup>. The WCR Flexibility data have been scaled down by a factor of 100 to lie on a 0 to 1 scale.

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10% level.

\*\*Denotes significance at the 5% level.

Table 9

Okun's law and unemployment persistence: 21 OECD countries, 1984–1990<sup>a</sup>

Dependent variable	(1) $\Delta Unemp.$ LSDV	(2) $\Delta Unemp.$ LSDV	(3) $Unemp.$ LSDV	(4) $Unemp.$ GMM
$Unemployment_{t-1}$			0.596** (0.117)	0.286** (0.148)
$Unemployment_{t-1}$ $*(1 - Flexibility_{t-1})$			0.462** (0.141)	0.820** (0.195)
$\Delta Unemployment_{t-1}$	0.366** (0.069)	0.318** (0.071)		
$\Delta GDP$	-0.261** (0.036)	0.123 (0.155)		
$\Delta GDP * Flexibility$		-0.481* (0.278)		
$\Delta GDP * Benefits$		-0.546* (0.321)		
$Flexibility$		0.002 (0.012)	0.011 (0.013)	-0.003 (0.007)
$Benefits$		-0.027 (0.031)	-0.040 (0.053)	-0.018 (0.038)
Country fixed effects	No	No	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	147	147	126	105
Adj $R^2$	0.41	0.43	0.98	0.06

$Unemp.$  abbreviates the unemployment rate. The WCR Flexibility data have been scaled down by a factor of 100.  $1 - Flexibility$  measures labor market inflexibility (on a 0 to 1 scale).

<sup>a</sup>Standard errors in parentheses.

\*Denotes significance at the 10% level.

\*\*Denotes significance at the 5% level.

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**The Cost of Job Security Regulation:  
Evidence from Latin American Labor Markets<sup>1</sup>**

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## 1. Introduction

Labor market regulations are introduced with the stated objective of improving workers' welfare. Mandated benefits and social security programs improve workers' income security in case of sickness, work accidents and old age. Job security provisions are designed to reduce a worker's odds of losing her job and her means of living. But, as is often true in economics, benefits usually come at a cost: mandated benefits may reduce employment; job security provisions may protect some workers at the expense of others.

This paper gathers evidence from existing and new sources of information on the costs of job security policies. Latin America has experienced a wide range of labor market policies that provide natural experiments with which to evaluate the impact of these policies. Our evidence challenges the prevailing view (see e.g. Abraham and Houseman (1994), Blank and Freeman (1994), Freeman (2000) and the papers he cites) that labor market regulations do not affect employment and have minimal costs. We establish that job security policies have a substantial impact on the level and the distribution of employment in Latin America. The evidence for their effect on unemployment is much weaker but there are good conceptual reasons why this should be so.

Our focus on the cost side does not imply we believe the benefits of labor policies for protected workers are small or irrelevant. While the benefits to recipients are well-documented, the costs are often unintended and less well understood. Thus, while the evidence suggests that regulations promoting job security reduce covered workers exit rates out of employment, it also indicates that demand curves are downward sloping, that regulation reduces aggregate employment and that the greatest adverse impact of regulation is on youth and groups marginal to the workforce. Insiders and entrenched workers gain from regulation but outsiders suffer. As a consequence, job security regulations reduce employment *and* promote inequality across workers.

The outline of the paper is as follows. Section 2 describes and quantifies job security regulations in Latin America and the Caribbean. In section 3, we summarize the existing evidence on the impact of job security provisions on employment, unemployment and turnover rates in Latin America. Section 4 presents new evidence. In section 5 we summarize the paper and present our conclusions.

## 2. Job Security Regulation in Latin America and the Caribbean

In this paper, we define job security legislation (JS) to include all those provisions that increase the cost of dismissing a worker. In this section, we quantify the costs of abiding by the legislation, in terms of wages, in order to address three questions: (1) How high are the implied costs of JS provisions in Latin America and the Caribbean? (2) Within the region, which countries have costlier termination provisions and which are more deregulated? (3) How do Latin American and Caribbean countries compare with industrial countries in terms of JS legislation?

In Latin American countries, labor codes based on the civil law system regulate the permissible types, durations and the conditions for termination of labor contracts. In contrast, most Caribbean countries are based on the common law system so the law enforces a contract with which both parties privately agree. As a consequence, in some countries there is not a specific body of law regulating employer-employee relationships, while in others some aspects are regulated while others are left to the courts.

In Latin America, labor codes favor full-time indefinite employment over part-time, fixed-term or temporary contracts. These types of contracts not only differ in the length of the employment relationship but also in the conditions for termination. While indefinite contracts carry severance pay obligations, temporary contracts can be terminated at no cost provided that the duration of the contract has expired. In contrast, most Caribbean countries do not regulate the range of admissible contracts. Instead, such decisions are left to the parties involved in collective bargaining.

There are important differences as well in the conditions for termination of contracts. In Latin America, the termination of a contract is severely restricted. Thus, labor codes mandate a minimum advance notice period prior to termination, determine which causes are considered “just” or “unjust” causes for dismissal, and establish compensation to be awarded to workers for each possible cause of termination. In some countries, firms must also request permission to dismiss more than a certain fraction of their labor force. Finally, some countries allow the reinstatement of a worker to her post if the dismissal is found to be “unjustified” by the courts, although, this provision has been eliminated in many countries. In contrast, in

some of the Caribbean countries, advance notice and severance pay are negotiated as part of collective agreements, so there are no specific laws regulating such provisions.

Termination laws (or collective agreements) require firms to incur four types of costs: advance notification, compensation for dismissal, seniority premium for dismissed workers and foregone wages during any trial in which the worker contests dismissal. The period of advance notification should be included in the computation of costs because, in general, the various laws typically allow firms to choose between providing advance notice or paying a compensation equivalent to the wage corresponding to that period. Moreover, since productivity can decline substantially after notice, advance notification should be considered as a part of the dismissal cost even when firms choose to notify workers in advance. Advance notification periods vary from country to country, ranging from zero in Nicaragua, Guatemala, Peru and Uruguay to three months in Bolivia, Haiti and Venezuela for workers with more than 10 years at a firm (See Table 1.A in the Appendix).

The second component of dismissal cost is compensation for unjustified dismissal. Since in most Latin American countries the economic difficulties of a firm are not considered a just cause for dismissal, any labor force reductions fall in this category. The formula for calculating this compensation is based on multiples of the most recent wage and the years of service. In contrast, in the Caribbean, under union agreements, severance pay is only awarded to a worker in the case that a firm needs to reduce the work force for lack of work or technological change. In most other cases, employment at will is still the norm provided that the firm gives reasonable advance notice to a worker. Finally, in Belize, Bolivia, Chile and Nicaragua, the law mandates compensation to the worker in case of a voluntary quit<sup>2</sup>.

In some countries, employers are required to make an additional payment, known as a seniority premium, upon termination of the work relationship regardless of the cause or party initiating the termination. In Ecuador, Colombia, Panama, Peru, and Venezuela, this benefit is available to the worker both in the case of unjustified dismissal and in the case of a voluntary quit. If a worker quits, she obtains this payment, whereas if the worker is dismissed she obtains this payment *plus* the compensation for dismissal. In Brazil, this additional payment is only available in the case of unjust dismissal, and if the worker quits, she receives no pay. In all the above-mentioned countries, firms deposit a certain fraction of

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<sup>2</sup> In Chile, compensation in case of a quit only occurs after the 7<sup>th</sup> year of service and if the worker chooses to set up an account.

workers' monthly wages in an individual trust fund in order to provide for this payment.<sup>3</sup> In Ecuador, Colombia, Brazil and Peru, the worker gains access to the principal plus a yield.<sup>4</sup> In Panama and Venezuela, the seniority premium is fixed in terms of multiples of monthly wages and the amount accrued in the fund (Panama) or the fund plus a certain yield (Venezuela) pays for the seniority premium. However, the firm is responsible for covering the difference between the required seniority premium and the amount accumulated in the seniority premium fund.

Finally, in some countries, firms are also required to pay a worker's foregone wages during the period of any legal process if a worker brings an action against the firm. This provision increases the overall cost of termination by either increasing the overall compensation due and/or reducing workers' incentives to settle out of court.<sup>5</sup>

During the nineties, seven countries (Colombia, Guyana, Guatemala, Nicaragua, Panama, Peru, and Venezuela) reformed their labor codes in order to reduce the cost of dismissing a worker. Not all labor reforms reduced JS, however. In Chile (1991) and in Dominican Republic (1992), the amount that a firm has to pay upon dismissal of a worker increased considerably during the nineties.

In an attempt to quantify all of these provisions we construct an index of JS encompassing LAC and industrial countries. There have been previous attempts to construct such types of measures. Bertola (1990), Grubbs and Wells (1993) and the OECD (1993, 1999) constructed ordinal measures of JS for industrial countries whereas Marquéz (1998) constructed ordinal measures of job security for a sample of industrial and LAC countries. Also, Lazear (1990) quantified firing costs as the amount (in multiples of monthly wages) owed to a worker if she is dismissed after 10 years of service. These measures, however, are unlikely to accurately reflect the magnitude of dismissal costs.

On the one hand, ordinal measures can only state that one country is more regulated than another, but cannot measure how much more regulated it is. On the other hand, JS tends to increase in tenure, which implies that measures conditional on certain level of tenure only measure a given point in the severance-tenure schedule. To address these shortcomings, we construct an alternative cardinal measure of firing costs that summarizes the entire tenure-severance pay profile using a common set of dismissal probabilities

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<sup>3</sup> In Brazil, the fund is called FGTS, in Peru, CTS, in Colombia, *Fondo de Cesantia* and in Panama, *Fondo de Antigüedad*.

<sup>4</sup> In Brazil a worker gets access to this fund only if she is dismissed.

across countries. This measure computes the expected future cost, at the time a worker is hired, of dismissing her in the future due to unfavorable economic conditions.<sup>6</sup> The index is constructed to include only firing costs that affect firm's decisions at the margin and therefore it does not include the full cost of regulation on labor demand. It includes the cost of providing statutory advance notice and severance pay conditional on each possible level of tenure that a worker can attain in the future.

The JS index does not include the seniority premium as part of cost because, in most countries, provisions for that payment are regularly deposited in a fund. Thus, because deposits are not directly made conditional on a dismissal they are not likely to alter firing decisions. Rather they should be treated as other labor costs incurred by the firm that do not affect firing decisions and are not included in our index. However, they clearly affect the cost of labor to the firm. The index also does not include the cost derived from foregone wages during trial. Although this component may be a substantial share of the total of cost of dismissal, we do not include it in our index because the information on this cost is not available. Thus we cannot estimate the full cost of resolution of legal costs arising from challenges to dismissals through the courts.

Our measure of JS thus reflects the marginal costs of dismissing full-time indefinite workers. However, this measure does not capture the effects of recent reforms that have made temporary and fixed-term contracts widely available in countries like Argentina and Peru. To the extent that fixed-term and indefinite contracts are not perfect substitutes—since temporary workers may be less productive (see the evidence in Aguirragabiria and Borganso, 2000)—our index still captures the marginal cost of firing a tenured worker. However, firms may be at the margin of firing temporary workers and so our index overstates the true marginal cost. Additional information regarding the construction of this index can be found in the Appendix. This measure will be used in Section 3 to quantify the impact of JS on different employment and unemployment measures in a sample of OECD and LAC countries.

Graph 1 displays the costs of advance notice and compulsory severance pay in Latin American and the Caribbean for 1990 and 1999 as summarized by our index. This graph reveals that even after many countries have reduced dismissal costs during the nineties, the average cost of dismissing a worker is still

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<sup>5</sup> Another component of dismissal costs that can be quite important in some countries is given by the specific regulations that govern collective dismissals. Information on those regulations is not available for most countries of LAC and therefore we did not include them in our discussion or measurements.

higher in Latin America than in our sample of industrial countries. In comparison, the countries of the Caribbean basin exhibit much lower dismissal costs.

Table 1: Job Security Index across Latin America, the Caribbean and OECD countries.  
End of the nineties

<i>Country</i>	<i>Index Job Security (Monthly wages)</i>	<i>% Annual wage</i>	<i>Ranking</i>
United States	0.000	0.000	1
New Zealand	0.221	1.844	2
Australia	0.443	3.696	3
Canada	0.553	4.610	4
Norway	0.912	7.599	5
Germany	1.140	9.498	6
France	1.143	9.526	7
Poland	1.219	10.160	8
Switzerland	1.247	10.395	9
United Kingdom	1.457	12.144	10
Belgium	1.729	14.407	11
Austria	1.784	14.864	12
Brazil	1.785	14.871	13
Greece	1.804	15.034	14
Guyana	1.890	15.750	15
Jamaica	1.920	16.003	16
Paraguay	2.168	18.068	17
Uruguay	2.232	18.599	18
Trinidad & Tobago	2.548	21.230	19
Nicaragua	2.563	21.358	20
Panama	2.718	22.652	21
Dominican Republic	2.814	23.454	22
Venezuela	2.955	24.625	23
Argentina	2.977	24.808	24
Costa Rica	3.121	26.005	25
Mexico	3.126	26.050	26
El Salvador	3.134	26.116	27
Spain	3.156	26.300	28
Chile	3.380	28.164	29
Colombia	3.493	29.108	30
Honduras	3.530	29.418	31
Peru	3.796	31.632	32
Turkey	3.973	33.110	33
Ecuador	4.035	33.621	34
Portugal	4.166	34.720	35
Bolivia	4.756	39.637	36

Source: Authors' computations (See Appendix)

<sup>6</sup> This measure is based on the index developed in Pagés and Montenegro (1999)

Looking at the individual countries, it may be surprising that countries like Argentina or Mexico exhibit lower JS than Chile, a country traditionally considered as having a more flexible labor market. This divergence is caused by the fact that our index only measures one component of labor market rigidities. So while Argentina and Mexico have stronger unions than Chile, and therefore are likely to have higher wage rigidity, Chile has higher individual job security provisions. Our index, also discounts penalties that arise far in the future, and so the fact that labor codes in Chile and other countries establish an upper limit in payments is discounted in our measure.

Graph 1 shows that four countries in Latin America (Nicaragua, Venezuela, Panama and Peru) undertook substantive reforms in their labor codes. Nicaragua and Venezuela reduced the expected dismissal cost by more than three monthly wages, while Panama and Peru reduced it between one and one and half monthly wages. However, Table 1 also makes clear that even after a decade of substantial deregulation, Latin American countries remain at the top of the JS list, with levels of regulation similar to or higher than those existing in the highly regulated South of Europe. We next consider quantitative estimates of the impact of job security regulations.

### **3. The impact of job security regulations**

The goal of this section is to quantify the impact of job security regulations on employment and turnover rates. The importance of dismissal costs in Latin America is clear in Graph 1. It is thus important to assess the impact, if any, that such policies have on the labor market.

#### **3.1 Theoretical discussion**

To analyze the impact of job security provisions requires a more complex framework that encompasses dynamic decisions of firms. Bertola (1990) develops a dynamic partial-equilibrium model to assess how a firm's firing and hiring decisions are affected by dismissal costs. In the face of a given shock, the optimal employment policy of a firm involves one of three state-contingent responses: (i) dismissing workers, (ii) hiring workers and (iii) doing nothing, in which case employment in that firm does not change. How are these decisions altered by firing costs? In the face of a negative shock and declining marginal value of

labor, a firm may want to dismiss some workers, but it has to pay a mandatory dismissal cost. This cost has the effect of discouraging firms from adjusting their labor force, resulting in fewer dismissals than in the absence of such costs. Conversely, in the face of a positive shock firms may want to hire additional workers but will take into account that some workers may have to be fired in the future if demand turns down, and this is costly. This prospective cost acts as a hiring cost, effectively reducing creation of new jobs in good states. The net result is lower employment rates in expansions, higher employment rates in recessions and lower turnover rates as firms hire and fire fewer workers than they would in the absence of these costs.

Bertola's model predicts a decline in employment variability associated with firing costs but the implication of his model for average employment is ambiguous. In particular, whether average employment rates increase or decline as a result of firing costs depends on whether the decline in hiring rates more than compensates the reduction in firings. Indeed, simulations reported in Bertola (1990) and Bentolila and Bertola (1990) suggest that average employment (in a given firm) is likely to increase when firing costs increase. These results, however, are quite sensitive to different assumptions about the persistence of shocks, the elasticity of the labor demand, the magnitude of the discount rate, and the functional form of the production function. Thus, less persistent shocks and lower discount rates are associated with larger negative effects of JS on employment because both factors reduce hiring relative to firing (Bentolila and Saint Paul, 1994). Furthermore, a higher elasticity of the demand for goods implies a larger negative effect of job security on employment rates (Risager & Sorensen, 1997). In addition, when investment decisions are also considered, firing costs lower profits and discourage investment, increasing the likelihood that firing costs reduce the demand for labor (Bertola, 1991).

The results just reported analyze employment rates in one firm without considering the impact of firing costs on the extensive margin, that is, on how firing costs affect the creation and destruction of firms. Hopenhayn and Rogerson (1993) develop a general equilibrium model based on the U.S. economy that accounts for entry and exit of firms. In their model, the partial equilibrium framework of Bertola (1990) is embedded in a general equilibrium framework in which jobs and firms are created and destroyed in every period in response to firm-specific shocks. In the context of their model, they find that increasing firing costs in the U.S. would lead to an increase in the average employment of existing firms as a consequence of the reduction in firings. However, they also find that such a policy would result in lower firm entry, and

lower job creation in newly created firms. For the parameter values they consider, these two last effects offset the increase in employment in existing firms resulting in a reduction of overall employment rates.

Job security may also affect employment through its effect on wages. The insider/outsider literature emphasizes that job security provisions increase the insider power of incumbent workers. This effect results in higher wages for insiders and lower overall employment rates (Lindbeck and Snower, 1987b). Caballero and Hammour (1997) consider a model in which job security provisions increase the *appropriability* of capital by labor by increasing capital specificity. That is, a larger part of the capital invested becomes relationship specific and becomes lost if capital separates from labor. While in the short-run, higher firing costs allow labor to extract higher rents from capital, in the long-run firms invest in less labor intensive technologies, reducing employment demand.

Some recent literature has also emphasized the possible impact of job security regulations on the composition of employment. Kugler (2000) proposes a model in which job security regulations provide incentives for high turnover firms to operate in the informal sector. This decision entails producing at a small, less efficient scale in order to remain inconspicuous to tax and labor authorities. In this framework, high job security is likely to increase informality rates. Pagés and Montenegro (1999) develop a model in which JS related to tenure biases employment against young workers and in favor of older ones. As severance pay increases with tenure, and tenure tends to increase with age, older workers become more costly to dismiss than younger ones. If wages do not adjust appropriately, negative shocks result in a disproportionate share of layoffs among young workers. Therefore, job security based on tenure results in lower employment rates for the young, relative to older workers, because it reduces hiring and *increases* firings for young workers.

We conclude that higher JS provisions reduce turnover rates and bias the composition of employment against young workers and against employment in the formal sector. The implications for average employment in the economy at large are, however, somewhat less conclusive since they can depend on specific configurations of parameters for the economy. To complicate matters further, by the Coase theorem the impact of job security could be completely “undone” with a properly designed labor contract provided that there are no restrictions on transactions between workers and firms. (Lazear, 1990). Thus, in a world without transactions costs, wages adjust to offset the possible negative impact highlighted

in the previous discussion. Given the ambiguity of theoretical models, the magnitude and direction of the impact of job security on employment has to be resolved empirically. In the following two subsections, we discuss existing evidence relating JS to labor market outcomes and present some new evidence of our own.

### **3.2. Empirical Evidence for Latin America and the Caribbean**

Despite the existence of strict job security regulation in most of the countries of the region, research assessing its impact has been extremely scarce. Fortunately, a recent series of empirical studies assess the impact of job security regulation on employment and turnover rates in Latin America and the Caribbean providing the first systematic evidence of its impact on the labor market.<sup>7</sup> Several studies assess the impact of job security on turnover rates in the labor market. Changes in turnover are measured using changes in the duration of jobs (tenure), the duration of unemployment and the exit rates out of employment and unemployment.<sup>8</sup> Higher employment exit rates indicate more layoffs (or more quits), while higher exit rates out of unemployment and into formal jobs indicate higher job creation in the formal sector. Other studies examine the impact of job security on employment rates. The definition of employment changes depending on the data considered. In general, most studies focus on employment in large firms, although some also examine more aggregated measures of employment. In addition, a small group of studies also examines the impact of job security on the composition of employment (See Table 2 for an overview of the empirical evidence for Latin America and the Caribbean).

#### **A. Turnover Rates**

The strongest evidence is on the impact of job security on turnover. As predicted by most theoretical models, the empirical evidence confirms that less stringent job security is associated with higher turnover in the labor market. Kugler (2000) analyzes the impact of the 1990 labor market reforms in Colombia. She finds that a reduction in job security is associated with a decline in average tenure and an increase in employment exit rates.<sup>9</sup> This decline is significantly larger in the formal sector that is covered by the regulations than in the uncovered or informal sector. In addition, the increase is larger in large firms

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<sup>7</sup> Most of these projects were developed under the IDB research network project “Labor Market Legislation and Employment in Latin America” coordinated by J. Heckman and C. Pagés.

<sup>8</sup> These studies estimate hazard rates. The hazard rate is defined as the probability that a given spell of employment or unemployment ends in a given period conditional on having lasted a given period of time (e.g., one month, one year).

and imprecisely determined in the smallest ones. Her results shows similar patterns within tradable and non-tradable sectors, providing a clear indication that the decline in tenure cannot be attributed to contemporary trade reforms. The increasing use of temporary contracts explains only part of the increase in formal sector turnover rates since job stability also declined for workers employed at permanent jobs.<sup>10</sup> Her results also indicate that the increase in turnover is larger for those workers who are more protected by high levels of job security, that is the middle aged and older men employed in large firms.

Kugler also finds a decline in the average duration of unemployment after the reforms. In addition, exit rates out of unemployment increase more for workers who exit to the formal sector than they do for those who exit to informal jobs. Her results show quite similar patterns across sectors and a higher exit rate towards larger firms. Finally, only two-thirds of the increase in the rate of entry into employment can be attributed to higher use of temporary contracts: the rest is explained by increased exit rates into permanent jobs in the formal sector. Her results for different workers suggest that the young and women benefit more from higher exit rates out of unemployment and into the formal sector.

The magnitudes of the estimated effects are not negligible. Kugler estimates that after the reform, the increase in probability of exiting employment was 6.4% larger for covered workers than for uncovered ones while the exit rates out of unemployment and into formal jobs increased by 5.9% with respect to exit rates to the informal sector.

Saavedra and Torero (2000) conduct a similar study, evaluating the impact of the 1991 reform in Peru. Like the reform in Colombia, the 1991 reform considerably reduced the cost of dismissing workers. Their analysis shows a consistent decline in average job tenure from 1991 onwards suggesting higher employment exit rates. As in Colombia, the decline is significantly more pronounced in the formal than in the informal sector, but the magnitude of the fall is larger in Peru. Finally, tenure patterns are also quite similar across economic sectors, suggesting that these findings cannot be explained by the far-reaching trade reforms that took place in that country in the early nineties.

Finally, Paes de Barros and Corseuil (2000) provide further evidence from Brazil. Their study estimates the impact of the 1988 Brazilian Constitutional reform on employment exit rates. In that year, the

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<sup>9</sup> In this study tenure is measured by the duration of incomplete spells.

<sup>10</sup> In her study, Kugler performs two types of analysis. First, she uses a difference-in-difference estimator to analyze whether changes in average duration of employment (unemployment) are statistically significantly different in the formal than in the informal sector.

cost of dismissing workers was raised and therefore a reduction in exit rates would be expected. Their results confirm that aggregate employment exit rates decline in the formal sector relative to the informal sector for long employment spells (two years or more).

The credibility of these studies hinges on the validity of the informal sector as a control group unaffected by the reforms. Kugler (2000) shows that while estimates based on formal-informal sector comparisons are likely to be biased, under plausible conditions, such comparisons are still valid, at least as tests of the null hypothesis of no effect of the reform.<sup>11</sup> When taken together, these studies provide consistent evidence that dismissal costs and other employment protection mechanisms reduce worker reallocation in the labor market. Unfortunately, these studies do not identify whether increased worker reallocation is due to increased layoffs, higher quits or a mix of both.

Hopenhayn (2000) provides further evidence of the link between JS and worker turnover rates in Argentina. In 1991, the government of Argentina deregulated the use of temporary and fixed-term short-duration contracts. In 1995, additional contractual forms were allowed including a three-month trial period. Such contracts reduced or eliminated the cost of terminating an employment relationship. Hopenhayn (2000) finds that after 1995, employment exit rates increase substantially for short employment duration while they remain constant for long durations. This increase in separations is due to a rise in both quits and layoffs, although the increase in layoffs is higher.

Summarizing, the evidence provided in this section indicates that JS regulations protect workers against the risk of losing a job. From this point of view, the recent reforms have reduced the income security of formerly protected workers. However, the evidence also suggests that stringent JS provisions reduce exit rates out of unemployment and into formal jobs, thus prolonging the duration of unemployment. Thus, recent labor market reforms have increased the probability of an unemployed worker finding a job in the formal sector.

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Second, she estimates an exponential duration model to control for changes in demographic covariates, pooling data from before and after the reform and using interaction terms to assess the differential impact in the formal and in the informal sector.

<sup>11</sup> Kugler shows that lower severance pay may induce high-turnover informal firms to move to the formal sector. Under the assumption of no overlap in the distribution of turnover between covered and uncovered firms, or that entry to the covered sector comes from the high-end –or at least from the end that is higher than the formal sector--, this shift results in higher turnover in both the

## B. Average Employment

The available evidence for LAC countries shows a consistent, although not always statistically significant, negative impact of JS provisions on average employment rates. Saavedra and Torero (2000) and Mondino and Montoya (2000) use firm-level panel data to estimate the impact of job security on employment in Peru and Argentina, respectively. Both studies estimate labor demand equations in which an explicit measure of job security appears on the right hand side of the equation, and both find evidence that higher job security levels are associated with lower employment rates.<sup>12</sup> In the case of Peru, Saavedra and Torero find that the size of the impact of regulations is correlated with the magnitude of the regulations themselves. Thus, the impact is very high at the beginning of their sample (1987-1990) coinciding with a period of very high dismissal costs (see Table 1.A). Afterwards, and coinciding with a period of deregulation, the magnitude of the coefficient declines, only to increase again from 1995 onwards, after a new increase in dismissal costs. Their estimates for the long-run elasticities of severance pay are very large (in absolute value): between 1987 and 1990 a 10% increase in dismissal costs, keeping wages constant, is estimated to reduce long-run employment rates by 11%. In subsequent periods, the size of the effect becomes smaller but is still quite large in magnitude (between 3 and 6%). In Argentina, the estimated long-run elasticity of a 10% increase in dismissal costs is also between 3 and 6%.<sup>13</sup>

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formal *and* the informal sector. Fortunately, higher turnover in the informal sector biases the difference-in-difference estimator downwards. Therefore, a positive estimate still provides substantial evidence of increased turnover in the formal sector.

<sup>12</sup> The data for the Peruvian study covers firms with more than 10 employees in all sectors of the economy. The Argentinean study only covers manufacturing firms. Given the nature of these surveys, they are better proxies for formal employment than for employment as a whole. The data used in these two studies does not capture job creation by new firms, since both panels are based on a given census of firms, without replacement.

<sup>13</sup> While the estimated job-security elasticity in Argentina is much lower (in absolute value) than the wage elasticity reported in Table 2, in the Peruvian case, this elasticity is larger. This is somewhat surprising since job security reduces job creation and *also* slows down employment destruction. Therefore, it might be expected that the JS elasticity would be smaller than the wage elasticity in absolute value. One explanation for the seemingly high elasticity found in the Peruvian study is that this measure is upwardly biased by a simultaneity problem arising from the job security measure. Thus, both the Peruvian and the Argentinean studies construct explicit measures of job security based on:

$$JS_{jt} = \beta_j T_{jt} P_{jt} SP_{jt}$$

Where  $\beta_j$  is the layoff rate in sector  $j$  in sector  $t$ ,  $T_{jt}$  is average tenure in sector  $j$ , time period  $t$ ,  $P_{jt}$  is the share of firms in sector  $j$ , time period  $t$ , that are covered by regulations and  $SP_{jt}$  is the mandatory severance pay in sector  $j$ , given average tenure  $T_{jt}$ . This measure provides variability across sectors and periods, and therefore it affords a more precise estimation of the impact of job security than before-after types of comparisons. Yet, such measure may also be correlated with the error term in a labor demand equation since the tenure structure of a firm might be correlated with its employment level. The fact that average layoff rates vary by sector may also lead to simultaneity if sectors with higher layoffs have lower employment. Thus, periods or sectors with low employment may be associated with less job creation, high average tenure and, consequently, high measures of job security. The Argentinean study shows that fixing tenure to the period average reduces the estimated elasticity of JS. Thus, a JS elasticity between 1/3 and 2/3 of the wage elasticity seems a more realistic estimate of its impact.

**Table 2: Summary of existing evidence on the impact of job security (JS) in Latin America**

<b>A. Studies that analyze exit rates into and out of employment</b>			
<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Results</i>
Kugler (2000)	Colombia	Household data	Decline in JS leads to reduction in employment and unemployment duration. Also hazard rates out of employment and out of unemployment increase. Some effect due to temporary contracts but not all
Saavedra and Torero (2000)	Peru	Household data	Lower JS is associated with lower average tenure. Higher decline in formal sector. Hazard rates increase just at the end of probation period.
P. de Barros and Corseuil (2000)	Brazil	Employment Surveys, Administrative data and Household surveys	Higher JS associated with a decline in employment exit rates in formal in relation to informal sector.
Hopenhayn (2000)	Argentina	Household data	Deregulation of temporary contracts leads to increase in hazard rates in short but not in long spells
<b>B. Studies that analyze average employment and unemployment</b>			
<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Results</i>
Downes et al. (2000)	Barbados	Aggregated employment. Annual. It covers large firms (>10 emp)	Negative effect of JS on labor demand (LD). Coeff. Significant at 10%
Saavedra and Torero (2000)	Peru	Firm and sector-level data. Bimonthly 1986-96. Quarterly 1997-98. Formal firms with more than 10 employees. Balanced panel (it does not account for firm creation or destruction)	Negative effect of JS on LD when using sector level-data for whole period. By subperiods, JS has a negative effect from 1987 to 1994, and no effect since then.
Mondino and Montoya (2000)	Argentina	Panel of manufacturing firms. It does not account for firm creation.	Negative effect of JS on LD. The coefficient in unbalanced panels is slightly more negative than in balanced ones.
Kugler (2000)	Colombia	Household data on employment.	Decline in JS in 1990 brings a decline in unemployment rates. Based on computing the net effect of changes in hazard rates, in and out of U induced by the reduction in JS.
P. de Barros and Corseuil (2000)	Brazil	Monthly establishment-level data. 1985-1998 Manufacturing. Firms employing 5 or more workers	Two step procedure. First, find parameters for labor demand (LD) function for every month. Then see whether those parameters change with labor reforms and other development. They find no effect of JS on LD parameters.
Pagés and Montenegro (2000)	Chile	Household data on employment. Annual 1960-1998	Negative but not statistically significant effect of JS on aggregated employment.
Marquéz (1998)	Cross-Country	Cross-section data for Latin America, Caribbean and OECD countries.	Rank indicator of Job Security. JS is not significantly associated with lower employment once GDP per capita is accounted for.
<b>C. Studies that analyze the composition of employment</b>			
<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Results</i>
Marquéz (1998)	Cross-Country	Cross-section data for Latin America, Caribbean and OECD countries.	Self-employment rates are positively associated with JS even after accounting for differences in GDP per capita.
Pagés and Montenegro (2000)	Chile	Household Survey Data. 1960-1998	JS is associated with lower employment rates for young workers and higher employment rates for older ones. No significant effect on U for young, middle age or older workers.

In a very different type of study, Kugler (2000) computes the net impact of the Colombia 1991 labor reform on unemployment rates. Using unemployment and employment exit rate estimates for periods before and after the reform, she finds that the reforms cause a decline in unemployment between 1.3 and 1.7 percentage points. Thus, as in Mondino and Montoya (2000) and Saavedra and Torero (2000), Kugler's estimates indicate that the positive impact on the hiring margin outweighs the negative impact on the firing margin, resulting in a decline in unemployment rates.

Other studies find negative, but not statistically significant, effects of job security on average employment rates. Pagés and Montenegro (1999) find that JS has a negative but not statistically significant effect on overall wage-employment rates in Chile. Similarly, Marquéz (1998), using a cross-section sample of Latin American and OECD countries finds a negative but not statistically significant coefficient of job security on aggregate employment rates. Table 3 summarizes the various estimates of job security on employment. (The Heckman and Pagés results are discussed below).

Thus, while the theoretical models exhibit some ambiguity regarding the impact of JS provisions on long-run employment rates, the empirical evidence for LAC is consistent across studies. To complement these analyses, we examine two other sources of evidence. First, we review the existing evidence on the impact of JS on employment in OECD countries. Second, in section 4, we provide new evidence combining employment, unemployment and job security measures from a panel of LAC and OECD countries.

**Table 3: Summary of Long- Run JS Elasticities**

<i>Study</i>	<i>Mean</i>	<i>S.E.</i>	<i>Employment Rate</i>
Saavedra & Torero (2000)	-0.406	0.06	Employment in Large firms
Mondino & Montoya (2000)			
High estimate**	-0.684	0.0145	Employment in Large firms
Low estimate***	-0.305	0.0060	Employment in Large firms
Pagés & Montenegro (1999)	-0.1198	0.2440	Wage-Employment/Population
Heckman & Pagés (2000), FE*	-0.0516	0.0318	Total Employment/Population
Heckman & Pagés (2000), RE*	-0.0502	0.0168	Total Employment/population
Heckman & Pagés (2000) OLS*	-0.0502	0.0168	Total Employment/population

Notes: \*Estimates for LAC only. \*\*Based on Table 9, Mondino & Montoya (2000) ,  
 \*\*\*Based on Table 10, option B. Mondino & Montoya (2000)

The evidence from OECD countries reinforces the results found for LA. Thus, with the exception of Anderson (1993), who finds a positive association between dismissal costs and long-run employment, the rest of the studies found a negative impact of JS on employment. Using panel data from OECD countries, Lazear (1990) shows that more stringent job security measures are associated with lower employment and labor force participation rates. Grubb and Wells (1993) find a negative correlation between JS and wage-employment rates. Addison and Grosso (1996) reexamine Lazear's estimates using new measures of job security across countries and find similarly negative effects on employment rates. Nickell (1997) finds a negative effect of JS provisions on total employment rates and no effect on prime-age male employment rates. Finally, a recent OECD (2000) study finds a negative but not statistically significant effect of JS on total employment rates. In contrast, the evidence regarding the effect of JS on unemployment in OECD countries is ambiguous but there are conceptual reasons for being so. While Blanchard (1998), Esping-Andersen (forthcoming), Jackman *et al* (1996) and Nickell(1997) among others find no effect of JS on unemployment, Lazear (1990), Elmeskov *et al* (forthcoming) and Scarpetta (1996) find positive effects. Yet, it should not be a surprise that a negative impact on employment is not necessarily reflected in a positive effect on unemployment. If workers' participation decisions are influenced by JS policies (as shown by Lazear, 1990), a reduction in employment will be associated to a decline in participation rates. This is particularly true for workers with lower attachment to the labor force or with less access to unemployment insurance benefits.

### **C. The Composition of Employment**

Some recent evidence sheds new light on the possible impact of JS on the composition of employment in LAC. Marquéz (1998) constructs a JS indicator for LAC and OECD countries and uses it to estimate the effects of JS on the formal/informal distribution of employment. He finds that more stringent JS provisions are associated with a larger percentage of self-employed workers. In a study of Chile, Pagés and Montenegro (2000) find that more stringent job security is associated with a substantial decline in the wage employment-to-population rates of young workers and an increase in the wage-employment rates of older workers. Their results also suggest that this composition effect is driven by the

high costs of dismissing older workers relative to younger ones created by job security provisions related to tenure.

#### **4. New Evidence**

In this section, we exploit substantial cross-country and time series variability in job security provisions to estimate whether the negative effects of JS encountered in some of the individual-country studies in LAC generalize to a wider sample of countries and reforms.

##### **A. The Data**

We construct a data set that spans industrial and LAC countries. To do so we proceed in two stages. We first collect employment and unemployment data for industrial countries from the OECD statistics. Second, we use the OECD definitions of these variables, to construct the same indicators out of Latin American Household Surveys. Table 4 provides summary statistics for the overall sample, the OECD sample (excluding Mexico, which is included in the LAC sample) and the LAC sample. Table 5 describes the household surveys used to compute the LAC variables. Finally, to characterize job security, we use the index of job security described in section 2.

The number of countries and the average number of observations per country in our sample varies between 36 and 43 countries and between 1 and 5 observations per country, respectively. Among the countries represented, around 28 belong to the sample of OECD countries, while 15 are from the LAC region. Regarding the period spanned in our sample, for most LAC countries, there are one or two observations from the eighties and one or two from the nineties. The OECD sample only covers the nineties. In relation to the variables used in this exercise, it should be noted that all employment rates are measured as a percentage of working age population and all unemployment rates as a percentage of active economic population (See the Appendix for a definition of the variables used in this study)

Table 4 shows some remarkable differences between the OECD and the LAC samples. As noted in section 2, average job security is higher in Latin America and the Caribbean than in OECD countries. In contrast, all employment rates (except for prime-age female employment) are higher and all unemployment rates are lower in the LAC region than in industrial countries. Especially notable are the higher share of

self-employment and the much lower share of long-term unemployment (more than 6 months) in LAC. Finally, union density and female participation are both lower in the LAC region.

## **B. Methodology and Results**

By constructing our own data set from individual household-level surveys, we are guaranteed that all the labor market variables are comparable and reliable. One drawback of our data is that we only have a few time series observations per country (usually three or four), and not necessarily from consecutive years. Given the nature of the data, we decided not to average observations from a given period –as done in most of the OECD studies on job security—and instead control for the state of the business cycle in a given year using GDP growth.

We use a reduced form approach to investigate whether countries and periods with more strict job security regulations are associated with lower employment or higher unemployment rates. Thus we estimate an average net effect of JS as it operates through intermediate variables which we do not include in the regression. In this paper, we do not estimate the theoretically more appropriate state-contingent demand functions because we lack the information on the states of demand confronting individual firms. JS costs govern the marginal costs of labor when firms are firing, but they also affect overall labor demand through their effect on expected (across states) labor cost. It is the latter effect that we attempt to identify. Since most of the variation is cross-sectional, we use different types of variables to control for country-specific factors that may be correlated with job security. First, we use demographic controls such as the share of the population between 15 and 24 and female participation rates. These variables account for the fact that high job security countries in the south of Europe and Latin America tend to have low female participation and a large share of youth population. Since both factors affect overall employment rates, not including them in the specification may lead to substantial biases in the estimates. We protect against common country-specific unobservables that remain constant over time and that may affect both left hand side and right hand side variables by including country-specific fixed effects in a set of regression specifications reported below. Second, we use GDP (measured in 1995 U.S. dollars) to control for

differences in development levels across countries. We also include a dummy variable for LAC to control for regional differences not controlled by GDP levels<sup>14</sup>.

Most of the variability in our sample comes from differences across countries and regions, and from some time series variance within the LAC sample. There is very little time-series variability in the OECD sub-sample. Given this variation, fixed effects (FE) estimates are likely to be very imprecise because they only use the time-series variation within the LAC sample. Instead, random effects (RE) or pooled OLS estimates, that use both the cross-section and the time-series variation included in the sample, are likely to produce estimates with smaller standard errors. Yet, the latter estimates will be biased if variables included as controls are correlated with country specific error terms. To protect against the bias that results from using one estimator, we estimate our basic specification by pooled OLS, RE and FE, comparing whether these different methodologies yield similar point-estimates.

The results, presented in Tables 6.a to 6.c, are striking. First, the point-estimates for the JS coefficient in the total employment specifications are very similar across estimation methodologies. The three estimates suggest a large negative effect of JS on employment rates. This effect is strongly statistically significant in the OLS and the RE estimates while it is not statistically significant, at conventional levels, in the FE case. One obvious advantage of using a cardinal measure of JS is that we can quantify the impact of these provisions on employment. The magnitudes of JS elasticities are quite large: an increase in expected dismissal costs equivalent to one month of pay is associated with a 1.8 percentage points decline in employment rates. Given that in Latin America the average dismissal cost in 2000 was 3.04 months (See Graph 1), the estimated loss in employment –as a percent of total working population-- due to JS provisions is about 5.5 percentage points.

In addition, OLS, FE and RE estimates suggest that JS does not affect the employment rates of all workers in the same fashion. Thus, while the impact on prime-age male employment rates is half the impact on total employment, the impact on young workers' employment rates is almost two times larger. The magnitudes are huge. The OLS and the RE estimates suggest that JS reduces LAC youth employment rates by almost 10 percentage points. This effect is even larger in the FE estimates. Moreover, these magnitudes are consistent with the ones obtained in Pagés and Montenegro (1999) for Chile.

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<sup>14</sup> These specifications should include a measure of labor costs that include wages and other non-wage labor costs. Unfortunately, a

Our estimates of the effect of JS on female employment rates, self-employment and unemployment rates are less consistent. The point estimates for female employment rates change from negative to positive across methodologies, but in no case are the estimates statistically significant. These results suggest that women are less negatively affected by JS than men but, as we will show, these results are not robust across regional sub-samples.

The estimates of the effect of JS on self-employment also change signs across OLS, FE and RE estimates. Thus, while the pooled estimates suggest a *positive* and statistically significant association between the strength of JS provisions and self-employment (as found by Marquéz (1998)), the FE estimates show a negative and also statistically significant relationship between both variables. It is clear that more empirical work is required to reach a definitive conclusion on the relationship between JS and self-employment.

Finally, the empirical results on unemployment also greatly depend on the methodology used to estimate the parameters. While OLS and RE yield positive (and often statistically significant) coefficients on JS in all the unemployment specifications, FE yields negative and statistically insignificant results. We do not find a significant relationship between the proportion of workers unemployed for more than 6 months and the strictness of JS provisions. Since there is no a priori relationship between disemployment and unemployment, these results are not surprising, especially given differences across regions in the levels of social insurance.

Divergence across estimation methods may result from regional differences in the relationship between JS and some of the variables. This is particularly relevant for our exercise since FE estimates discard practically all of the information for OECD countries. We therefore investigate whether our results are driven by any of the two sub-samples, by estimating separate coefficients for LAC and OECD countries. The results from this exercise are presented in Table 7. While this approach results in small samples and lower statistical significance, the results are still quite remarkable. First, in all the employment specifications, with the exception of female employment rates, the coefficients on job security are negative across regions and estimation methods. In addition, most of the coefficients are highly statistically significant.

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complete and comparable measure of labor costs across countries and time is not available.

Second, with one exception, all coefficients of the effect of job security on unemployment rates are positive both in OECD and in LAC countries. However, the impact on unemployment rates seems much larger in the industrial country sub-sample, in particular for women and youth. It should not come as a surprise that the effect of JS on unemployment rates is smaller in developing countries. In the absence of unemployment insurance or other income support programs, workers either quickly find other (less attractive jobs) or drop out of the labor force.<sup>15</sup> The positive and statistically coefficient of GDP level in the unemployment regressions reported in Tables 6a-6c confirms this effect.

Third, the ranking of effects between total, male and young workers employment rates is preserved. The point estimates tend to be larger (in absolute value) in the LAC sample. It is very likely that the higher level and variability of JS in this region contributes to these larger (in absolute value) point estimates. It is quite puzzling, however, that the estimates for female employment (and unemployment) rates are so different across regions. Thus, while, JS is negatively associated with female employment rates in the OECD sub-sample, this relationship is actually positive in the LAC sample. The added worker effect is more evident in LAC, where adult female attachment to the labor force is still weak. Understanding gender differences in the impact of JS remains one important issue for further research.

Finally, the evidence of the impact of job security on the formal/informal composition of employment is not conclusive. A comparison of our estimates for LAC with the elasticities obtained from the individual-country studies (see table 3), suggest that the decline in employment associated with JS is greater in the covered (formal) sectors--such as the manufacturing sector or sectors with large-firms--than in the aggregate.<sup>16</sup> This would imply that an increase in job security is associated with a decline in formal employment and an increase—although not enough to compensate the decline in formal jobs—in informal employment. However, the estimates for self-employment—usually considered part of the informal employment--in Table 7 Panel A, indicate an unstable effect of JS on self-employment. While the coefficient resulting from OLS estimation is positive and significant, the coefficient resulting from fixed effect estimation is negative and statistically significant. More research is necessary to understand the relationship between uncovered employment and job security in Latin America.

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<sup>15</sup> In the case of Chile, Montenegro and Pagés (1999) found that the large effects of JS on youth employment rates were compensated with a large decline in participation rates with no significant effects on unemployment.

<sup>16</sup> The Heckman and Pagés elasticities, reported in Table 3, are obtained from a model identical to the one reported in Table 6, but where job security provisions enter the specification in logs.

## 5. Conclusions

In a recent article, Freeman (2000) writes that “the institutional organization of the labour market has identifiable large effects on distribution, but modest hard-to-uncover effects on efficiency.” This view is shared by many economists (see Abraham and Houseman (1994) and Blank and Freeman (1994)). However, the results summarized in this paper suggest that job security regulations have a substantial impact on employment and turnover rates both in Latin America and in OCED countries and thus substantially affect the efficiency of the labor market.

The assertion that job security does not have any impact on employment rates is based on evidence on unemployment, not on employment. However, employment and unemployment are not mirror images of each other. In addition, while there is substantial evidence that unions reduce earnings inequality in industrial countries, there is no evidence that job security provisions reduce income inequality. Indeed, given that job security reduces the employment prospects (and possibly wages) of younger and less experienced workers, who bear the brunt of regulation, it is likely that regulation widens earnings inequality across age groups. Thus, there is no trade off between employment and inequality associated with job security provisions. Such provisions worsen both. The choice of labor market institutions matters.

What policy lessons can be drawn from these results? Our evidence suggests that job security provisions are an extremely inefficient and inequality-increasing mechanism for providing income security to workers. They are inefficient because they reduce the demand for labor; they are inequality-increasing because some workers benefit while many others are hurt. Their impact on inequality is multifaceted: Job security increases inequality because it reduces the employment prospects of young, female and unskilled workers. It also increases inequality because it segregates the labor market between workers with secure jobs and workers with very few prospects of becoming employed. Finally, job security provisions increase inequality if, as predicted by some theoretical studies and most of the available empirical evidence, they increase the size of the informal sector.

In this light, it seems reasonable to advocate the substitution of job security provisions by other mechanisms that provide income security at lower efficiency and inequality costs. However, reducing dismissal costs is a difficult policy to implement in most countries. The persistence of these policies can be

explained by a demand for income security for groups with political power (Caballero and Hammour, 2000). A demand for income security arises because job security lowers flows out of unemployment and into employment. Although job security reduces the probability of exiting employment, conditional on having lost a job, the probability of finding a new one is reduced. This produces a sense of insecurity among protected workers, who exert pressure to maintain high levels of job security provisions. A balance of power that favors insider workers helps to sustain job security provisions. Thus, those workers most likely to benefit from such provisions are also more likely to be represented in the political process. Instead, outsider workers are less likely to influence policy. Reform minded policymakers should pursue broad coalitions including representatives of outsider workers --such as young, female, unemployed or discouraged workers-- to obtain support for labor market reforms.

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## Appendix

### Construction of the index of job security

The job security index is constructed according to the following formula:

$$Index_{jt} = \sum_{i=1}^T \beta^i d^{i-1} (1-d) (b_{jt+i} + aSP_{jt+i}^{jc} + (1-a)SP_{jt+i}^{uc})$$

where  $j$  denotes country,  $d$  is the probability of remaining in a job,  $\beta$  is the discount factor,  $T$  is the maximum tenure that a worker can attain in a firm,  $b_{jt+i}$  is the advance notice to a worker that has been  $i$  years at a firm,  $a$  is the probability that the economic difficulties of the firm are considered a justified cause of dismissal,  $SP_{jt+i}^{jc}$  is the mandated severance pay in such event to a worker that has been  $i$  years at the firm, and finally,  $SP_{jt+i}^{uc}$  denotes the payment to be awarded to a worker with tenure  $i$  in case of unjustified dismissal.<sup>17</sup>

The constructed index measures the expected discounted cost, at the time a worker is hired, of dismissing a worker in the future. The assumption is that firms evaluate future costs based on current labor law. The index only includes statutory provisions, and thus, it does not include provisions negotiated in collective bargaining or included in company policy manuals. In addition, it does not include dismissal costs that are ruled by a judge if a firm is taken to courts. This assumption explains why dismissal costs—according to our index—are zero in the U.S., despite the substantial potential costs associated with legal actions. High values of the index indicate periods or countries of high job security, whereas lower values characterize periods or countries in which dismissal costs are lower. By construction, this index gives equal weight to notice periods and to severance pay since both are added up in the calculation of the dismissal costs. This index however gives a higher weight to dismissal costs that may arise soon after a worker is hired—since they are less discounted at the time of hiring—while it discounts firing costs that may arise further in the future.

In computing the index, we assumed a common discount rate and a common turnover rate of 8% and 12%, respectively. The choice of the discount rate is based on the average return of an internationally diversified portfolio. Finally, the choice of turnover rate is based on the fact that real turnover rates are

unobservable in countries with job security provisions since the turnover rate, is itself affected by job security. We therefore choose to input all countries with the observed turnover rates in the U.S., the country in the sample with the lowest job security. The minimum tenure at a firm is considered to be one year, and the maximum is assumed to be twenty years.

We compute  $SP_j^{jc}$  and  $SP_j^{uc}$  based on the two different sources. For LAC countries, we use the legal information summarized in Table 1.A. This information was directly obtained from the Ministries of Labor of the region. In the case of Colombia we consider that severance payment prior to the 1990 reform was one month and  $\frac{1}{2}$  per year of work instead of one--as prescribed by law--to include that prior to the 1990 reform, advance withdrawals to the seniority premium fund were accounted in nominal terms. High inflation rates implied that this practice substantially increased overall dismissal costs. For OECD countries, we use the legal information summarized in OECD (1999). In all Latin American countries but Argentina and Chile, economic conditions are not a just cause for dismissal. Consequently, we assumed  $a=0$  for those countries. Instead, in Argentina, Chile, economic conditions were a justified cause of dismissal and therefore,  $a=1$ . For OECD countries, we used the information summarized in Table 2.A.2 OECD (1999) to parameterize severance payments and advance notice. In all cases, but in Spain,  $a=1$ . In Spain, mandatory severance pay in the case of unjustified cause was substantially larger than severance pay for just cause. Consequently most workers fired for just cause appealed to the courts, and there was a high probability that a judge would declare a dismissal unjustified. Based on Bertola, Boeri and Cazes (2000), we assume that prior to the 1997 reform,  $a=0.2$ . After 1997, the scope for ambiguity was reduced and  $a=0.5$ . For Canada, we used the information relevant to the federal jurisdiction (although JS provisions may vary across states). Finally, in some European countries statutory dismissal costs vary across blue and white-collar workers. To obtain a single measure per country, we compute a separated index for blue and white-collar workers and performed a simple average among the two. (See OECD, 1999 for a description of dismissal costs in OECD countries and the cost divergences between blue-and white-collar workers.)

### Definition of Variables used in Empirical Section

**Total Employment.** All employed workers between 16 and 65 that declared having a job in the week of reference. It is measured as % of total population 16-65. All measures of aggregate employment include formal and informal workers. They also include unpaid workers. Source: OECD statistics and LAC household Surveys.

**Prime Age-Male Employment:** % of men 25-50 years old employed in the week of reference. Source: OECD statistics and LAC household Surveys.

**Prime Age-Female Employment:** % of female 25-50 years old employed in the week of reference. Source: OECD statistics and LAC household Surveys.

**Youth Employment:** % of people 16-24 years old employed in the week of reference. Source: OECD statistics and LAC household Surveys.

**Self-Employment:** Share of non-agricultural workers in self-employment or as owners of firms. Source: Maloney (1999)

**Total Unemployment:** # of people 16-65 that did not work in the week of reference but are actively looking for a job as a % of total active population in that age group. Source: OECD statistics and LAC household Surveys.

**Prime-Age Male Unemployment:** # of men 25-50 that did not work in the week of reference but are actively looking for a job as a % of male active population in that age group. Source: OECD statistics and LAC household Surveys.

**Prime-Age Female Unemployment:** # of people 25-50 that did not work in the week of reference but are actively looking for a job as a % of female active population in that age group. Source: OECD statistics and LAC household Surveys.

**Youth Unemployment:** # of people 16-24 that did not work in the week of reference but are actively looking for a job as a % of active population in that age group. Source: OECD statistics and LAC household Surveys.

**Long-term unemployment:** # of people 16-65 that have been without a job, and actively looking for one for more than 6 months as a % of total active population in that age group. Source: OECD statistics and LAC household Surveys.

**Female Participation:** % of total female workers 16-65 that are either employed or actively seeking one. Source: OECD statistics and LAC household Surveys.

**GDP:** Gross Domestic Product measured in 1995 US dollars. Source: World Bank.

**Population 15-24:** Proportion of population in this age group. Source: UN Population Statistics



Table 1.A: Legislation Concerning Conditions of Dismissal in 1990 and 1999. X=monthly wages, N=Years of Tenure

	Date of Reform		Advance Notice		Seniority Premium		Compensation if worker quits?		Compensation for dismissal due to economic reasons		To whom the reforms apply?	Upper limit to compensation for dismissal?			
			1990	1999	1990**	1999	1990	1999	1990	1999		1990	1999	1990	1999
Argentina	None	1-2 months	1-2month	0	0	0	0	0	2/3x*N, Min 2 months	No changes		Max. lim. in x	No changes		
Bahamas	None	1/2-1 month	No changes	0	0	0	0	0	Negotiable	No changes		No	No changes		
Barbados	None	Negotiable in practice 1month	No changes	0	0	0	0	0	0.41*x*N if N>=2	No changes		Max. x*N=3.75	No changes		
Belize	None	1/2 - 1 month	No changes	0	0	1/6x*N if N>10	No changes	No changes	1/4x*N if N>5	No changes		Max 42 weeks	No changes		
Bolivia	None	3 months	No changes	0	0	1 x*N. if N>=5	No changes	No changes	1 x*N.	No changes		No	No changes		
Brazil	1988	1 month	No changes	Fund (8% wage + r)	Fund (8% wage+ r)	0	0	0	0.4*FUND	No changes		No	No changes		
Chile	1991	1 month	No changes	0	0	No	1/2 x*N (2) if N>=7	No changes	1 x*N. (3)	No changes	All workers	Max. x*N = 5	Max. x*N = 11		
Colombia	1990	45 days	No changes	x*N	Fund (8% wage+r)	Fund	No changes	No changes	x*4.0 if N=5 x*6.6 if N=10 x*16.5 if N=15 x*21.5 if N=20	x*4.0 if N=5 x*6.6 if N=10 x*21.5 if N=15 x*28.5 if N=20	All workers	No	No changes		
Costa Rica	None	1 month	No changes	0	0	0	0	0	x*N	No changes		Max. x*N=8	No changes		
Ecuador	None	1 month	No changes	Fund (8% wage+ r)	Fund (8% wage+r)	Seniority Premium	No changes	No changes	1/4 x*N plus 3*x if N <=3 plus x*N if N = 3 - 25 plus pension if N>=25	No changes		No	No changes		
El Salvador	1994	0-7 days	No changes	0	0	0	0	0	x*N 0 if bankruptcy	x*N Changes in max. x	All workers	Max. base wage= 4 min. wages (4 )	No changes		
Guatemala	None	0	0	0	0	0	0	0	2 days-4 months if bankruptcy. x*N otherwise	No changes		No	No changes		

<b>Guyana</b>	1997	1/2 month	1month If N>=1	0	0	0	0	0	Negotiable In practice, 2 1/2 weeks per N	1/4*x*N if N=1-5 1/2*x*N if N=5-10	All workers	No	Max. x*N = 12
<b>Honduras</b>	None	1day-2 months	No changes	0	0	0	0	0	x*N	No changes		Max. x*N = 15	No changes
<b>Jamaica</b>	None	2-12 weeks	No changes	0	0	0	0	0	1/3*x*N if x=2-5 1/2*x*N if x>5	No changes		No	No changes
<b>Mexico</b>	None	0 - 1 month	No changes	0	0	0	0	0	2/3 x*N (Min. 3*x)	No changes		No	No changes
<b>Nicaragua</b>	1996	1- 2 months	0	0	0	0	0	x*N if N=1-3 3x*N + 2/3x*N if N>3	Negotiated In practice, 2 x*N.	x*N if N=1-3 3x*N + 2/3x*N if N>3		No	Max. x*N = 5
<b>Panama</b>	1995	1 Month	No changes	1/4*X*N if N>=10	1/4*X *N	1/4*X*N if N>=10	1/4*X*N	1/4*X*N	X*N if N<=1 3*x if N=2 3*x + 3/4*x*N if N>2<10 9*x+ 1/4*x*N if N>=10	3/4X*N if N<10 7.5*x+1/4*X if N>=10	New employees	No	No changes
<b>Paraguay</b>	None	1-2 months	No changes	0	0	0	0	0	1/2 x*N	1/2 x*N		No	No changes
<b>Peru</b>	1996	0	0	Determined by judge in legal	Fund (8% wage+r)	Fund (8% wage+r)	Seniority Premium	3 x*N	FUND+1.5*x* N	1991 New Employees	Max. x*N = 12	No changes	
	1995									1995 All workers			
	1991			Proceedings						1996 All workers			
<b>Rep. Dom.</b>	1992	1/4 -1 month	No changes	0	0	0	0	0	1/2*x*N	.67*x*N if N=1-4 .74*x*N if N>=5,	New employees	No	No changes
<b>Suriname</b>	None	1/4-.6 month.		0	0	0	0	0	Negotiated	Negotiated		No	No changes
<b>Trin. and Tob.</b>	None	2 months		0	0	0	0	0	1/3 x*N if N = 1- 4, 1/2 x*N if N>5	No changes		No	No changes
<b>Uruguay</b>	None	0	0	x*N	No changes	0	0	0	x*N	No changes		Max. x*N = 6	No changes
<b>Venezuela</b>	1997	1/4 -3 months.	No changes	x*N	2x*N	X*N	2x*N	2x*N	2/3-2 x*N	x*N	All workers	No	Max x*N=5

Source: Ministries of Labor in the region \*\*In Brazil, the date refers to 1988 (instead of 1990 )

**Graph1: Job Security Index**  
 (Expected discounted cost of dismissing a worker, in multiples of monthly wages)

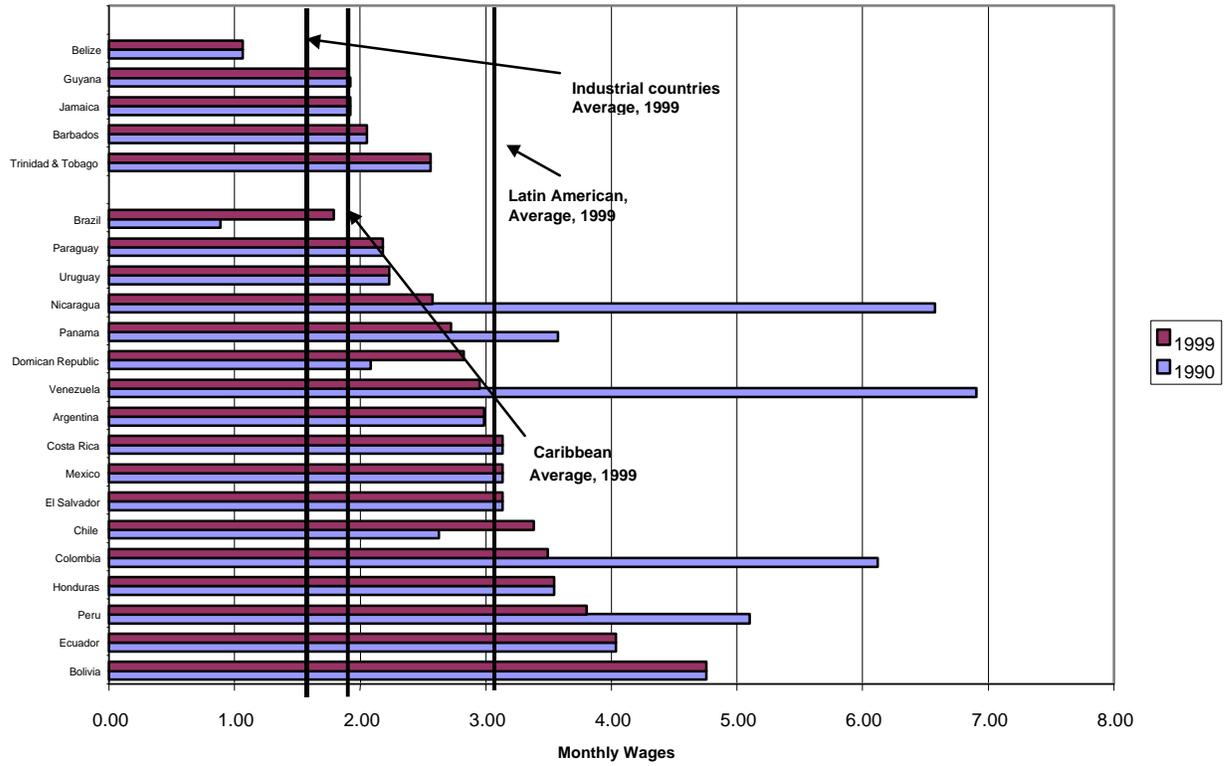


Table 4: Summary Statistics

Average Statistics for the overall sample					
Variable	Observations	# countries	# per country	Mean	Std. Dev.
Total Employment	221	43	5.1	66.09	8.44
Prime-Age Male Employment	139	43	3.2	89.19	4.93
Prime-Age Female Employment	139	43	3.2	56.88	14.85
Youth (15-24) Employment	140	43	3.3	53.05	15.47
Self-employment	84	40	2.1	26.92	11.87
Total Unemployment	221	43	5.1	8.01	4.15
Prime-Age Male Unemployment	221	43	5.1	8.01	4.15
Prime-Age Female Unemployment	139	43	3.2	4.99	3.09
Youth (15-24) Unemployment	139	43	3.2	6.25	4.39
Unemployed > 6months/Total U.	140	40	3.5	13.42	7.71
Job Security	205	36	5.7	2.62	1.74
GDP (US dollars 1995)	212	42	5.0	5.E+11	9.E+11
GDP growth	179	41	4.4	2.90	3.30
Proportion pop 15 to 24	221	43	5.1	0.16	0.03
Female Participation	221	43	5.1	55.64	13.34
Union density	47	39	1.2	26.52	17.79
Average Statistics for Latin America and the Caribbean					
Variable	Observations	# countries	# per country	Mean	Std. Dev.
Total Employment	59	15	3.93	71.950	4.222
Prime-Age Male Employment	59	15	3.93	91.746	3.157
Prime-Age Female Employment	59	15	3.93	47.191	10.699
Youth (15-24) Employment	59	15	3.93	63.662	11.078
Self-employment	59	15	3.93	32.742	8.269
Total Unemployment	59	15	3.93	7.404	3.296
Prime-Age Male Unemployment	59	15	3.93	3.881	2.578
Prime-Age Female Unemployment	59	15	3.93	4.666	3.134
Youth (15-24) Unemployment	59	15	3.93	10.881	4.670
Unemployed > 6months/Total U.	42	15	3.93	14.548	7.262
Job Security	108	16	2.69	3.512	1.567
GDP (US dollars 1995)	66	20	5	1.24E+11	1.99E+11
GDP growth	59	17	3.88	3.312	3.837
Proportion pop 15 to 24	71	17	3.47	0.197	0.016
Female Participation	59	18	3.94	44.255	10.526
Union density	21	17	1.23	18	11.37
Average Statistics for OECD Sample (Excluding Mexico)					
	Observations	# countries	# per country	Mean	Std. Dev.
Total Employment	162	28	5.79	63.96	8.59
Prime-Age Male Employment	80	28	2.86	87.31	5.16
Prime-Age Female Employment	80	28	2.86	64.02	13.39
Youth (15-24) Employment	81	28	2.89	45.33	13.54
Self-employment	25	25	1.00	13.17	6.47
Total Unemployment	162	28	5.79	8.22	4.41
Prime-Age Male Unemployment	162	28	5.79	8.22	4.41
Prime-Age Female Unemployment	80	28	2.86	5.80	3.19
Youth (15-24) Unemployment	80	28	2.86	7.43	4.81
Unemployed > 6months/Total U.	81	24	3.38	15.28	8.90
Job Security	97	16	6.06	1.63	1.36
GDP (US dollars 1995)	146	25	5.84	6.25E+11	1.07E+12
GDP growth	120	24	5.00	2.70	3.00
Proportion pop 15 to 24	150	25	6.00	0.15	0.02
Female Participation	162	28	5.79	59.79	11.77
Union density	26	22	1.18	33.43	19.18

Table 5: Description of Household Surveys

Country	Year	Name of the survey	Sample size		Month when Survey was Held
			Households	Individuals	
Bolivia	96	Encuesta Nacional de Empleo	8,311	35,648	June
	97	Encuesta Nacional de Empleo	8,461	36,752	November
Brazil	81	Pesquisa Nacional por Amostra de Domicilios	103,193	481,480	September
	83	Pesquisa Nacional por Amostra de Domicilios	113,599	511,147	September
	86	Pesquisa Nacional por Amostra de Domicilios	65,277	289,533	September
	88	Pesquisa Nacional por Amostra de Domicilios	68,833	298,031	September
	92	Pesquisa Nacional por Amostra de Domicilios	78,188	317,145	September
	93	Pesquisa Nacional por Amostra de Domicilios	80,054	322,011	September
	95	Pesquisa Nacional por Amostra de Domicilios	85,167	334,106	September
Chile	96	Pesquisa Nacional por Amostra de Domicilios	84,862	331,142	September
	87	Encuesta de Caracterización Socioeconómica Nacional	22,719	97,044	December
	90	Encuesta de Caracterización Socioeconómica Nacional	25,793	105,189	November
	92	Encuesta de Caracterización Socioeconómica Nacional	27,666	110,555	November
	94	Encuesta de Caracterización Socioeconómica Nacional	45,379	178,057	November
Colombia	96	Encuesta de Caracterización Socioeconómica Nacional	33,636	134,262	November
	95	Encuesta Nacional de Hogares - Fuerza de Trabajo	18,255	79,012	September
Costa Rica	97	Encuesta Nacional de Hogares - Fuerza de Trabajo	32,442	143,398	September
	81	Encuesta Nacional de Hogares - Empleo y Desempleo	6,604	22,170	July
Dominican Republic	83	Encuesta Nacional de Hogares - Empleo y Desempleo	7,132	23,449	July
	85	Encuesta Nacional de Hogares - Empleo y Desempleo	7,351	23,960	July
	87	Encuesta de Hogares de Propósitos Múltiples	7,510	34,591	July
	89	Encuesta de Hogares de Propósitos Múltiples	7,637	34,368	July
	91	Encuesta de Hogares de Propósitos Múltiples	8,002	35,565	July
	93	Encuesta de Hogares de Propósitos Múltiples	8,696	37,703	July
	95	Encuesta de Hogares de Propósitos Múltiples	9,631	40,613	July
	97	Encuesta de Hogares de Propósitos Múltiples	9,923	41,277	July
Ecuador	96	Encuesta Nacional de Fuerza de Trabajo	5,548	24,041	February
El Salvador	95	Encuesta de Condiciones de Vida	5,810	26,941	August to November
Honduras	95	Encuesta de Hogares de Propósitos Múltiples	8,482	40,004	1995
Mexico	89	Encuesta Permanente de Hogares de Propósitos Múltiples	8,727	46,672	September
	92	Encuesta Permanente de Hogares de Propósitos Múltiples	4,757	24,704	September
	96	Encuesta Permanente de Hogares de Propósitos Múltiples	6,428	33,172	September
	98	Encuesta Permanente de Hogares de Propósitos Múltiples	6,493	32,696	March
	84	Encuesta Nacional de Ingreso Gasto de los Hogares	4,735	23,985	Third quarter
Nicaragua	89	Encuesta Nacional de Ingreso Gasto de los Hogares	11,531	57,289	Third quarter
	92	Encuesta Nacional de Ingreso Gasto de los Hogares	10,530	50,862	Third quarter
	94	Encuesta Nacional de Ingreso Gasto de los Hogares	12,815	60,365	Third quarter
	96	Encuesta Nacional de Ingreso Gasto de los Hogares	14,042	64,916	Third quarter
Panama	93	Encuesta Nacional de Hogares Sobre Medicion de Niveles de Vida	4,455	24,542	February to June
Paraguay	79	Encuesta Continua de Hogares - Mano de Obra	8,593	24,284	
	91	Encuesta Continua de Hogares - Mano de Obra	8,867	38,000	August
	95	Encuesta Continua de Hogares	9,875	40,320	August
	97	Encuesta de Hogares	9,897	39,706	August
Peru	95	Encuesta de Hogares - Mano de Obra	4,667	21,910	August to November
Venezuela	85-86	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida	5,108	26,323	July 1985 to July 1986
	91	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida	2,308	11,507	September-November
	94	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida	3,623	18,662	May-August
	96	Encuesta Nacional de Hogares sobre Niveles de Vida y Pobreza	16,744	88,863	
	97	Encuesta Nacional de Hogares sobre Niveles de Vida y Pobreza	3,843	19,575	September-November
Venezuela	81	Encuesta de Hogares por Muestra	45,421	239,649	Second semester
	86	Encuesta de Hogares por Muestra	129,713	682,636	Second semester
	89	Encuesta de Hogares por Muestra	61,385	315,650	Second semester
	93	Encuesta de Hogares por Muestra	61,477	306,629	Second semester
	95	Encuesta de Hogares por Muestra	18,702	92,450	Second semester
	97	Encuesta de Hogares por Muestra	15,948	76,965	Second semester

**Table 6.a: OLS Estimation. Full Sample**

	Total	Male Prime-age	Female Prime-age	Youth	Self-	Total	Male Prime-age	Female Prime-age	Youth	Proportion of Unemp.
	Emp.	Emp.	Emp.	Emp.	Empl.	Unemployment	Unemployment	Unemployment	Unemployment	> 6 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
LAC	16.04*** (1.33)	4.70*** (.91)	-11.37 (3.22)	28.47 (3.29)	11.67*** (3.21)	-2.12** (1.15)	-2.75*** (.70)	-4.23*** (1.11)	-7.16*** (2.57)	-44.14*** (3.76)
Job Security	-1.37*** (.32)	-0.81*** (.258)	-1.46 (.90)	-3.54*** (3.97)	1.37** (.58)	0.83*** (.28)	.87*** (.19)	.833*** (.31)	.87* (.53)	.86 (.89)
GDP growth	-.108 (.133)	-0.05 (.110)	-0.124 (.387)	.008 (.36)	.50** (.23)	0.06 (.116)	-0.04 (.08)	.10 (.13)	0.083 (.21)	-0.16 (0.36)
GDP level	-3E-12*** (1.28e-12)	-1.97E-12 (1.39e-12)	2.45E-12 (4.86e-12)	-3.5E-12 (4.58e-12)	-3.01E-12 (3.33e-12)	3.51E-12 (1.11e-12)	2.91E-12*** (1.06e-12)	3.6E-11** (1.68e-11)	2.55E-12 (2.69e-12)	6.71E-12* (3.88e-12)
Female part.	0.399*** (0.047)	-	-	.334*** (.12)	.240*** (.084)	-.108*** (.04)	-	-	-.186 (.078)	-.65*** (0.14)
Pop 15to24	11.56 (27.08)	-	-	-	115.26** (52.12)	-34.49 (23.53)	-	-	-69.89 (48.85)	-96.57 (17.28)
Constant	41.63*** (5.21)	89.95*** (1.21)	62.81*** (4.27)	33.19*** (8.32)	-19.35 (10.59)	17.43 (5.07)	3.24*** (.93)	5.09 (1.47)	36.21** (10.12)	104.7*** (17.25)
N. observations	114	77	77	78	65	114	77	77	78	64
R-square	0.73	0.33	0.29	0.53	0.57	0.23	0.32	0.26	0.30	.85

Notes: Standard errors reported within parenthesis. \* indicates significant at 10, \*\* significant at 5% and \*\*\* significant at 1%.

**Table 6.b: Random-Effects (RE) Estimation. Full Sample**

	Total	Male Prime-age	Female Prime-age	Youth	Self-	Total	Male Prime-age	Female Prime-age	Youth	Proportion of Unemp.
	Emp.	Emp.	Emp.	Emp.	Empl.	Unemployment	Unemployment	Unemployment	Unemployment	> 6 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
LAC	15.26*** (2.15)	4.62** (1.82)	-11.05** (5.47)	29.99*** (5.23)	14.56*** (3.90)	-2.24 (1.93)	-2.36* (1.26)	-3.79 (1.92)	-7.29 (3.81)	-48.61*** (6.35)
Job Security	-1.84*** (.505)	-1.04** (.48)	.526 (1.33)	-3.28*** (1.38)	.35 (.87)	.69 (.45)	.77** (.34)	1.06** (.515)	.99 (.86)	.95 (1.49)
GDP growth	-0.001 (.073)	.054 (.091)	.218 (.199)	0.164 (.278)	.393*** (.166)	-.04 (.06)	.016 (.07)	.12 (.09)	-.084 (.135)	-0.171 (.246)
GDP level	-4.14E-12 (2.51e-12)	-2.68E-12 (2.42e-12)	1.31E-11* (7.03e-12)	-7.18E-12 (6.87e-12)	-5.36E-12 (4.39e-12)	4.23E-11* (2.24e-12)	3.13E-12* (1.71e-12)	4.72E-12* (2.57e-12)	-5.36E-12 (4.39e-12)	9.49E-12 (6.80e-12)
Female part.	0.33*** (0.047)	-	-	0.63*** (.13)	.036 (.08)	.021 (.04)	-	-	.037 (.077)	-.304* (.161)
Pop 15to24	3.16 (26.84)	-	-	-	40.22 (54.40)	29.98 (25.22)	-	-	41.98 (46.25)	115.79 (115.28)
Constant	47.77*** (5.74)	90.37*** (1.89)	54.06*** (5.34)	16.80* (9.43)	6.95 (11.13)	.53 (5.38)	3.36** (1.36)	4.23** (2.01)	4.95 (9.81)	50.7*** (22.22)
N. observations	114	77	77	78	65	114	77	77	78	64
R-square	0.72	.32	.23	0.50	.57	.13	.31	.25	.17	0.82
Hausman Test	5.46 (.36)	3.90 (.27)	2.17 (.57)	9.43 (0.05)	53.56 (0.00)	9.53 (0.08)	4.87 (.18)	3.75 (.28)	8.78 (.11)	8.06 (.15)

Notes: Standard errors reported within parenthesis. \* indicates significant at 10, \*\* significant at 5% and \*\*\* significant at 1%.

**Table 6.c : Fixed –Effects (FE) Estimation. Full Sample**

	Total	Male	Female	Youth	Self-	Total	Male	Female	Youth	Proportion
		Prime-age	Prime-age				Prime-age	Prime-age		of Unemp.
	Emp.	Emp.	Emp.	Emp.	Empl.	Unemployment	Unemployment	Unemployment	Unemployment	> 6 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Job Security	-1.55	-0.013	3.27	-6.04*	-8.43***	-.187	-1.06	0.021	-1.16	1.51
	(1.07)	(1.183)	(2.29)	(3.55)	(1.73)	(.99)	(.96)	(1.28)	(1.62)	(4.64)
GDP growth	0.049	.143	.145	.278	.111	-0.09	-0.05	0.024	-.25*	-0.17
	(.078)	(.101)	(.19)	(.303)	(.150)	(.07)	(.08)	(.11)	(.13)	(.28)
GDP level	-1.92E-11	-2E-11***	5.5E-11**	-6.7E-11**	-3.01E-12	1.6E-11***	2.1E-11***	2.4E-11**	3.9E-11***	3.90E-11
	(8.84e-12)	(9.97e-12)	(1.93e-11)	(3.25e-11)	(3.74e-12)	(8.1e-12)	(8.15e-12)	(1.08e-11)	(1.48e-12)	(4.55e-11)
Female part.	0.34***	-	-	1.00***	.240	.07	-	-	.08	-.07
	(0.05)			(.19)	(.104)	(.05)			(.09)	(.23)
Pop 15to24	-5.93	-	-	-	115.26	56.03*	-	-	60.71	529.05**
	(31.20)				(51.13)	(28.63)			(49.10)	(218.91)
Constant	59.67***	95.94***	27.14***	42.15***	-19.35	-9.05	3.00	-.008	-7.12**	-63.79***
	(7.21)	(3.37)	(6.54)	(11.35)	(10.37)	(6.62)	(2.76)	(3.66)	(11.63)	(45.53)
N. observations	114	77	77	78	65	114	77	77	78	64
N. countries	28	28	28	28	27	28	28	28	28	25
R-square	0.09	0.05	0.05	0.03	0.30	0.03	0.03	0.08	0.01	0.04

Notes: Standard errors reported within parenthesis. \* indicates significant at 10, \*\* significant at 5% and \*\*\* significant at 1%.

**Table 7: The impact of job security in the regional sub-samples**

A. Latin America and the Caribbean							
<i>Dependent Variable</i>	<i># Obs.</i>	<i>OLS Coefficient</i>	<i>OLS S.E.</i>	<i>RE Coefficient</i>	<i>RE S.E.</i>	<i>FE Coefficient</i>	<i>FE S.E.</i>
Total Employment	53	-1.29***	(0.36)	-1.62***	(0.59)	-1.83	(1.34)
Male prime-age Employment	53	-1.03***	(0.30)	-1.44**	(0.58)	-0.48	(1.24)
Female prime-age Employment	53	0.78	(1.11)	3.15**	(1.52)	3.10	(2.59)
Youth Employment	53	-4.21***	(0.94)	-4.33***	(1.30)	-7.50*	(3.70)
Self-employment	53	1.09*	(0.63)	-0.58	(0.98)	-8.34***	(1.73)
Total Unemployment	53	0.34	(0.35)	.06	(0.04)	0.13	(1.26)
Male prime-age Unemp.	53	0.94***	(0.24)	0.91***	(0.43)	-0.74	(1.02)
Female Prime-age Unemp.	53	0.27	(0.33)	0.51	(0.52)	0.06	(1.42)
Youth Unemployment	53	0.35	(0.47)	-0.22	(1.60)	-0.22	(1.60)
% Long-term Unemp.	30	0.13	(0.98)	-0.11	(1.36)	0.42	(5.31)
B. OECD Countries (Excluding Mexico)							
<i>Dependent Variable</i>	<i># Obs..</i>	<i>OLS Coefficient</i>	<i>OLS S.E.</i>	<i>RE Coefficient</i>	<i>RE S.E.</i>	<i>FE Coefficient</i>	<i>FE S.E.</i>
Total Employment	61	-0.82	(0.57)	-3.30***	(1.16)	-	-
Male prime-age Employment	24	-0.06	(0.66)	-0.07	(1.13)	-	-
Female prime-age Employment	24	-5.80***	(1.69)	-6.16***	(2.38)	-	-
Youth Employment	25	1.32	(2.81)	-4.41	(4.58)	-	-
Self-employment		Not enough observations					
Total Unemployment	61	1.14**	(.56)	2.27**	(1.10)	-	-
Male prime-age Unemp.	24	0.50	(0.49)	0.48	(0.77)	-	-
Female Prime-age Unemp.	24	2.23***	(0.85)	2.04*	(1.19)	-	-
Youth Unemployment	25	.586	(1.98)	4.70*	(2.93)	-	-
% Long-term Unemp.	35	2.003	(1.85)	3.31	(3.62)	-	-

Note: standard errors between parenthesis. The specifications for the two sub-samples include the same repressors than in the overall sample.

\* indicates significant at 10, \*\* significant at 5% and \*\*\* significant at 1%.

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THE EFFECT OF JOB SECURITY REGULATIONS  
ON LABOR MARKET FLEXIBILITY:  
EVIDENCE FROM THE COLOMBIAN LABOR MARKET REFORM

Adriana D. Kugler

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The Effect of Job Security Regulations on Labor Market Flexibility:  
Evidence from the Colombian Labor Market Reform

Adriana D. Kugler

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### **ABSTRACT**

Job security provisions are widely believed to reduce dismissals and hiring. In addition, in developing countries job security is believed to reduce compliance with labor regulations and to increase informal activity. Reductions in dismissal costs are, thus, often advocated as a way to increase labor market flexibility and to increase compliance with labor regulations. This paper analyzes the impact of a substantial reduction in dismissal costs introduced by the Colombian Labor Market Reform of 1990. A theoretical model illustrates the effect of dismissal costs when there is a noncompliant sector. The model shows the direct effect of a reduction in dismissal costs on increased turnover as well as the second order effects on wages and on the composition of the compliant and noncompliant sectors. Using microdata from the Colombian National Household Surveys, I exploit the temporal variability in dismissal costs together with the variability in coverage between formal and informal workers (who are not covered and were, thus, not directly affected by the reform). The differences-in-differences results indicate increased separations and accessions for formal workers relative to informal workers after the reform. Moreover, the increase in worker turnover was greatest among younger workers, more educated workers, and workers employed in larger firms who are most likely to have been affected by the reform. The estimates, together with the steady-state conditions of the model, suggest the reform contributed to 10% of the reduction in unemployment during the period of study.

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## **I. Introduction**

Job security regulations are usually considered to inhibit labor market flexibility by reducing the ability of firms to hire and fire workers. While severance pay and other job security provisions admittedly protect workers from unjust termination, these laws may also adversely affect workers by reducing their ability to find new jobs. State-mandated severance pay and job security requirements are equivalent to taxes on job destruction that reduce firms' incentives not only to dismiss but also to hire new workers. In fact, it has often been suggested that the elevated severance pay and job security requirements in Europe are in part to blame for the high unemployment levels in this continent.

The perception that reducing firing costs would help to reduce unemployment by enhancing labor market flexibility, through increased worker turnover into and out of unemployment, has driven several European countries to introduce labor market reforms in this direction. In particular, a number of countries including, England, France, Germany, and Spain, introduced temporary contracts during the 1980's as a way of reducing severance payments and payments for unjust dismissals. In contrast, American labor markets became more rigid during the 1980's. During this decade, a number of states in the U.S. introduced indemnities for unjust dismissals, thus, creating exceptions to the employment-at-will doctrine.

Although the evidence on the effects of these legislative changes on employment and unemployment in Europe and the U.S. has been ambiguous, reforms to reduce labor market rigidities have also been advocated and implemented in a number of less developed countries. In less developed countries the effects of these reforms are considered to be even greater, as labor market regulations are considered not only to discourage hiring and firing, but in addition to encourage noncompliance with labor legislation and the expansion of the informal sector.

In this paper, I consider the incidence of a substantial reduction of firing costs on flexibility and unemployment in a less developed country. In particular, this paper studies the impact of the Colombian labor market reform of 1990, which reduced severance payments substantially, on worker flows into and out of unemployment and its implied net effect on unemployment. I use a micro-level data set from Colombia to examine the effects of a reduction in firing costs on worker turnover. The labor market reform introduced in Colombia in 1990 reduced severance payments for all workers hired after 1990 and covered by the legislation (formal sector workers). Informal workers, who are not covered by the legislation, were not *directly* affected by the reform and, thus, are used as a comparison group in the estimations. The empirical analysis exploits this variability in the coverage of the legislation between formal and informal sector workers together with the temporal change in the Colombian legislation to identify the effects of a reduction in firing costs on the exit rates out of employment and out of unemployment. The Colombian Household Surveys for June provide information about formal and informal sector activity and allow estimating hazard rates for formal and informal workers, before and after the reform. The results of the hazard models using a differences-in-differences estimator indicate that hazard rates into and out of unemployment increased after the reform for formal sector workers (covered by the legislation) relative to informal workers (uncovered). Moreover, the increase in worker turnover was greater among younger more educated workers employed in larger firms who are likely to have been affected most by the changes in the legislation.

The rest of the paper proceeds as follows. In Section II, I survey the evidence on the effect of firing costs on employment volatility, the speed of employment adjustment, and employment levels, labor market participation, and unemployment for developed countries. In

Section III, I describe the legislative changes, introduced by the Colombian labor market reform of 1990 that led to a reduction in severance pay and other firing costs. In section IV, I develop a matching model with endogenous sorting into a formal and an informal sector. The model is useful as it predicts the direct effect of a reduction in severance pay on worker turnover as well as the general equilibrium effects of the reform on turnover in the two sectors. Section V discusses the identification strategy of the firing cost effects on worker turnover. In Section VI, I describe the data and present the results on the incidence of firing costs on the exit rates into and out of unemployment. In Section VII, I use the steady-state condition from the model together with the results in Section VI to estimate the net impact of the reform on unemployment. Section VIII concludes.

## **II. Review of the Literature**

The perception that flexible labor markets promote employment and reduce unemployment is widely accepted. Yet, the theoretical and empirical evidence on the net effects of firing costs on employment and unemployment are ambiguous.

Past theoretical work on the effects of firing costs shows that while reductions (increases) in firing costs are expected to increase (reduce) hiring and firing as well as employment volatility, the net effects of reductions in firing costs on employment and unemployment are ambiguous. Theoretically, the net effect of firing costs on employment is very sensitive to the assumptions of the model. The net effect of firing costs on employment depends crucially on whether the entry-exit margin is considered and on the stochastic process assumed to be generating the demand shocks. Hopenhayn and Rogerson (1993) simulate the effect of firing costs in a general equilibrium framework with firm entry and exit and they find that an increase in firing costs reduces employment. On the contrary, Bentolila and Bertola (1990) consider a

partial equilibrium model with a monopolistic firm and find that employment increases slightly with firing costs, because the firing effect dominates the hiring effect. In addition, Bentolila and Dolado (1994) argue that in an insider-outsider model a-lá Lindbeck and Snower (1988), firing costs may strengthen the position of insiders and increase their employment while reducing the employment of outsiders.

Similarly, past empirical evidence indicates that lower firing costs are related to greater employment volatility, but the evidence of the net effect of firing costs on employment and unemployment in these studies has been mixed. Bertola (1990) constructs job security indices for ten countries and finds that job security provisions are negatively correlated with the variance of employment and with unemployment's response to output changes (i.e., Okun's coefficient). Using a panel of retail firms in the U.S., Anderson (1993) finds that the seasonal variability in employment is lower in firms facing higher adjustment costs. Moreover, a number of studies have related the speed of employment adjustment to shocks to the level of firing costs. As predicted by the theory, Anderson (1993) finds that the probability of responding to shocks is negatively correlated to the adjustment costs faced by firms. In addition, Hamermesh (1993) finds that the speed of employment adjustment to shocks fell in non-unionized industries over the 1980's in the U.S., when exceptions to the employment-at-will doctrine were being introduced. Using British data Burgess (1993) finds a lower speed of employment in industries subject to higher firing costs. Bentolila and Saint-Paul (1992) also find that employment adjustments over the business cycle increased in Spain after the introduction of temporary contracts in 1984. Thus, these studies provide evidence of the greater employment volatility when firing costs are lower.

The evidence on the impact of firing costs on employment and unemployment, however,

appear mixed. Lazear (1990) uses cross-country data from 22 developed countries over 29 years and finds evidence suggesting that high severance payments and advance notice requirements reduce employment and labor force participation. Grubb and Wells (1993) construct job security indices for OECD countries and also find a negative correlation between job security and employment. Di Tella and MacCulloch (2004) use a measure of flexibility provided by employers and they find that flexibility is positively correlated with employment and participation, and to a lesser degree with unemployment. In contrast, Bertola (1990) finds evidence suggesting that job security provisions are unrelated to medium and long run employment. Nickell and Layard (1999) find that employment and labor force levels are lower when employment protection legislation (EPL) is stricter, but since they are exploiting cross-country variation they cannot control for the fact that female labor force participation is lower and EPL stricter in Southern European countries. In fact, they find that the results disappear when considering a sample of adult males. The OECD's Employment Outlook (1999) exploits additional temporal variation in EPL and finds no effect of EPL on aggregate employment. However, consistent with the story that EPL protects insiders, the Employment Outlook finds that EPL increases the employment of adult men and reduces the employment of young workers and women.

Exploiting the temporal change in the labor legislation across states in the U.S., Dertouzos and Karoly (1993) find employment levels fell in states that introduced more stringent employment protection. In contrast, Miles (2000) finds no effect of the changes in unjust dismissal costs in the U.S. on aggregate employment. However, both Autor (2003) and Miles (2000) find that stricter employment protection contributed to the rise in temporary employment in the U.S. over the 1980's. Anderson (1993), instead, exploits the experience-rating feature of

the U.S. unemployment insurance system to quantify adjustment costs and finds higher average employment in firms subject to higher adjustment costs. The mixed results observed in the literature are not surprising if one considers that cross-section studies are subject to omitted variable biases, simultaneity problems, and endogeneity of the legislation. The panel studies while mitigating the concerns of omitted variable biases and simultaneity are subject to the possibility of endogeneity of the legislation as well as to selection biases. Thus, while the evidence on the effects of firing costs on the volatility of employment appears robust, the net effect of firing costs on employment and unemployment is not as clear.<sup>1</sup>

More recently, a handful of studies have exploited the differential variation in labor legislation for certain groups of workers to set up natural experiments of the impact of firing costs using microdata. While Acemoglu and Angrist (2001) find no effect of the American with Disabilities Act on separations of disabled relative non-disabled, Oyer and Schaefer (2000) find substitution of individual dismissals for mass layoffs after the passage of the Civil Rights Act of 1990 for groups covered by the legislation. Kugler and Saint-Paul (2003) and Autor, Donohue and Schwab (2003) find increased hires and employment in those states that introduced certain unjust dismissal provisions over the 1980's. Finally, Kugler, Jimeno and Hernanz (2003) find increased hiring of young workers and increased separations of older workers after the introduction of the Spanish labor market reform of 1997, which reduced dismissal costs and payroll taxes for these groups of workers.

While micro studies solve some of the problems in studies relying on macrodata, these studies have focused on the impact of firing costs in developed countries. There is little

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<sup>1</sup> However, a number of recent studies, including Angrist and Kugler (2003), Bertola, Blau and Kahn (2003), and Blanchard and Wolfers (2000), find that the negative effects of labor market institutions on employment and unemployment are realized when economies are faced with bad shocks.

evidence on the impact of firing costs in less developed countries. In the next section, I describe the legislative change introduced in Colombia in 1990, which allows to exploit the temporal variability and the variability in coverage of labor legislation to estimate the impact of firing costs on turnover and unemployment in a less developed country.

### **III. Changes in the Colombian Institutional Framework**

In 1990, Colombia introduced a labor market reform that substantially reduced the costs of dismissing workers. The Colombian reform reduced severance payments, widened the definition of ‘just’ dismissals, extended the use of temporary contracts, and speeded up the process of mass dismissals. All of these policy changes reduced the costs of firing workers covered by the legislation after 1990.<sup>2</sup> The reform, thus, reduced firing costs for firms in the formal sector but not for informal firms, which did not comply with labor legislation.

Although the reform introduced various legislative changes simultaneously, the one major policy change that decreased the costs of dismissals was the reduction of severance payments.<sup>3</sup> The reform reduced the severance paid for dismissals in three ways. First, prior to the reform, employers were mandated to pay severance of one month per year worked based on the salary at the time of separation. After the reform, employers were, instead, required to deposit a monthly contribution equivalent to one month of the yearly salary at that moment in time to an individual severance payments savings account (“Fondo de Cesantías”), which would be accessible to workers in the event of separation. Thus, total severance payments were reduced because the monthly payment per year worked was no longer based on the higher salary at the

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<sup>2</sup> In addition to the Labor Market Reform of 1990, a social security reform was passed in 1994 and implemented in 1995 and 1996. However, since the social security reform increased payroll taxes, the increase in non-wage recurrent costs of this reform implies different effects on turnover than the reduction in dismissal costs of the Labor Market Reform of 1990. Moreover, the study by Gruber (1997) of a similar reform in Chile finds no effects of payroll taxes on employment because recurrent costs are passed onto wages.

<sup>3</sup> Note that both before and after the reform, employers were exempt from the payment of severance in cases when employees were dismissed because of undue care, sabotage, or release of employers’ proprietary information.

time of separation, but rather on the salary during each month. Second, prior to the reform, workers could obtain advance payments from their severance to use for investments in education and housing, that would only be credited to the employer in nominal terms in the event of separation. After the reform, although the withdrawal of funds was still permitted, these ‘loans’ were now credited to the employer in real terms. According to Ocampo (1987), the fact that, prior to the reform, withdrawals were credited to the employer in *nominal* terms implied, on average, a cost of 35% of the total severance payments in the manufacturing sector prior to 1990. Finally, the change in the legislation reduced severance pay, because the introduction of guaranteed severance payments essentially turned severance payments into a deferred compensation scheme, allowing workers lower wages in exchange for future severance.<sup>4</sup> Not all workers were, however, affected in the same way by the reduction in severance payments. As indicated above, workers hired by informal firms are not covered by the legislation and, thus, should not had been affected directly by the reform. Moreover, family workers, temporary workers, and workers employed by firms with 5 or less employees are not entitled to severance payments, and domestic workers and workers employed by firms with very little capital are entitled only to a severance payment of 15 days per year worked.

A second important change introduced by the reform was the change in the legislation with regards to indemnities for ‘unjust’ dismissals. First, the definition of ‘unjust’ dismissals changed in 1990. Prior to the reform, ‘just’ cause dismissals included dismissals of employees because of fraud, violence, undue care, sabotage, discipline problems, deficient performance, and release of proprietary information. After the reform, the definition of ‘just’ cause dismissals was extended to include any dismissal for failure to comply with firm regulations and instructions

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<sup>4</sup> Kugler (2002) studies the impact a change from a standard severance payments system into a system of severance payments savings accounts.

from one's supervisors. The exemptions for the payment of indemnities for 'unjust' dismissals were thus extended after the 1990 reform, reducing firing costs for formal firms. Second, the reform eliminated the ability of workers with more than ten years of tenure to sue for backpay and reinstatement. At the same time, however, the reform increased the cost of 'unjustly' dismissing workers with more than ten years of tenure (see Table 1) and this may have increased the incentives for firms to dismiss workers just before reaching 10 years of seniority.<sup>5</sup> Thus, these changes in 'unjust' dismissal legislation can be expected to have the greatest impact on formal workers with intermediate levels of seniority.

Another important change brought about by the reform was the extension of the use of fixed-term contracts.<sup>6</sup> Prior to 1990, fixed term-contracts were allowed for a minimum duration of a year.<sup>7</sup> After the reform, these fixed-term contracts were extended to contracts of less than a year (renewable up to three times). This change in the legislation, thus, lowered firing costs for firms hiring workers for less than a year and would be expected to have increased turnover among formal workers with less than a year of tenure after the reform.

An additional change introduced by the reform was a reduction in the advance notice for mass dismissals. While advance notice requirements for mass layoffs existed prior to the reform (see Table 2), the reform introduced penalties to bureaucrats who did not process requests for mass layoffs quickly. If such threats to bureaucrats were effective, this change in the legislation should have speeded up the dismissal process for formal firms and lowered their costs of firing.

Finally, the reform also introduced a new type of contract that eliminated severance

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<sup>5</sup> Note, however, that employees with more than ten years of experience hired before 1990 could also choose to be covered by the new regime with Severance Payments Savings Accounts.

<sup>6</sup> While temporary contracts are subject to payroll taxes and social security contributions, these contracts are not subject to severance pay and 'unjust' dismissal legislation as long as contracts end by the agreed date.

<sup>7</sup> Despite legislation on fixed-term contracts, however, firms could circumvent this restriction by subcontracting workers from temp agencies even prior to the reform.

payments altogether. This type of contract (“Salario Integral”) allowed formal workers who earned more than ten times the minimum wage to opt out of severance payments, indemnities for unjust dismissals, benefits (except paid vacations), social security contributions, and payroll taxes in exchange for a higher salary. The introduction of this type of contract effectively allowed firms to eliminate the cost of dismissing highly paid workers who opted for the “Salario Integral”. Thus, one would expect to find a greater effect of the reform on formal sector workers with salaries above ten minimum wages.<sup>8</sup>

The changes in severance pay legislation, ‘unjust’ dismissal legislation, temporary contracts, and mandatory advance notice introduced by the Colombian Labor Market Reform should have directly reduced the costs of dismissals for formal firms and increased turnover in the formal sector. Moreover, it is often argued that job security regulations simply encourage the expansion of the informal sector and one would, thus, expect for this type of reform to have encouraged greater compliance with the legislation. The next section introduces a matching model with firing costs, which shows the direct effect on formal turnover of a reduction in firing costs as well as the indirect effects on formal and informal turnover through the compositional changes of firms in each sector. The model shows that a reform that reduces dismissal costs may not only increase turnover, but it may also increase compliance with state-mandated firing costs.

#### **IV. A Sorting Model of Compliance with Job Security Provisions**

This section presents a matching model with a formal sector and an informal sector in which firms sort themselves between the two sectors. Firms producing in the formal sector must comply with labor legislation and have to pay state-mandated severance in the event of a

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<sup>8</sup> By 1994 only 1.5% of all workers in manufacturing and 0.6% of workers in commerce had opted for this type of contract (Lora and Henao, 1995). Since the surveys used in the analysis do not indicate whether a worker indeed opted for an Integral Salary, we examine whether the impact of the reform was greater on older and highly educated workers who are more likely to earn above ten minimum wages.

dismissal, while firms in the informal sector do not comply with job security legislation and avoid the severance payment. Productivity in the informal sector is, however, lower overall than in the formal sector because informal firms must produce at a smaller scale to remain inconspicuous to the authorities. Moreover, the presence of a firm-specific component to productivity in the model implies that, in equilibrium, firms with higher idiosyncratic productivity self-sort into the formal sector while firms with lower idiosyncratic productivity self-sort into the informal sector.

The model predicts that the probability of being dismissed by a formal firm is lower because of the legislated severance payments, but also because formal firms are more productive. Also, a reduction in severance payments increases the probability of dismissals in the formal sector through a direct effect on the firing costs. In addition, however, the reduction in firing costs has effects on the idiosyncratic composition of firms in each sector as well as on the wages paid in each sector. This model, thus, highlights the potential biases that may arise in empirical studies that attempt to quantify the effects of firing costs.

### **A. Assumptions**

In this model, heterogeneous firms may choose to produce in a formal sector in which they must comply with job security provisions or to produce in the informal sector without complying but at the cost of lower productivity. Workers are identical *ex-ante*, but they may have different productivity *ex-post* depending on how well they match. After a match, the firm and worker set the wage according to a Nash-bargaining solution. Then, the firm decides whether to keep or dismiss the worker.

### **Production in Each Sector**

Formal and informal production is a function of a sector-specific component,  $a_s$ , of a

firm-idiosyncratic component,  $A$ , and of the match-quality component,  $\gamma$ , and produce with a technology,  $Y_s = a_s \gamma A$ , for  $s = F, I$ . Sector-specific productivity is fixed and it is assumed, without loss of generality, that  $a_F = 1 > a_I = a$ . The firm-idiosyncratic component comes from a distribution  $F(A)$ , and the match-quality component comes from a distribution  $G(\gamma)$ .

### **Timing**

Firms, first, observe their firm-specific productivity. Firms then choose a sector given the productivity in the sector and their known firm-specific productivity. Formal and informal firms hire in the same market and, immediately after hiring, they observe the match-specific productivity. Then, firms and workers bargain over wages. At the end of the process firms decide whether to keep or dismiss the worker, and formal firms that do dismiss must provide a severance payment,  $C$ . However, workers may still be separated afterwards at arrival rates,  $\lambda_F$  and  $\lambda_I$ , due to exogenous reasons, in which case firms do not pay severance.

### **Matching**

All firms and workers search in the same market. The arrival rate of applicants to formal and informal firms is the same,  $q(\theta) = m(1/\theta, 1)$ , where  $\theta = v/u$ . The arrival rate of job opportunities is  $\theta q(\theta)$ , and workers receive offers from formal or informal firms with a given probability that depends on the share of firms in each sector.

### **Wage-setting**

Each firm and worker pair sets the wage based on Nash bargaining. Wages are set after firm-specific and match-specific productivities are observed. In this model, all wages are affected by job security legislation, because the severance pay raises the utility of the

unemployed and thus raises the reservation wage of all workers.<sup>9</sup>

## B. Solution to the Model

The model is solved by backward induction. First, the solution for the dismissal choices in each sector is found. Second, the Nash-bargaining solution of the wage is determined. Finally, the marginal firm between the two sectors is determined to solve for the split of firms between the formal and informal sectors.

### Dismissal Decisions

The present discounted profits for a firm with a filled job is  $J_s$  and the present discounted value of a vacant job is  $V_s$ , for  $s = F, I$  (formal and informal, respectively). Thus, the asset equation of a filled and a vacant job are given by the following equations, respectively:

$$r J_s = Y_s - w_s + \lambda_s (V_s - J_s),$$

$$r V_s = q(\theta) (J_s - V_s),$$

As there is free-entry, and all profit-opportunities are exploited,  $V_s = 0$ . Thus,

$$J_s = [a_s \gamma A - w_s] / (r + \lambda_s + q(\theta)).$$

Once matched, a firm must choose whether to keep or dismiss a worker. A formal firm has to pay a cost,  $C$ , if it decides to dismiss, while an informal firm does not have to pay the firing cost.

Thus, the minimum match-productivity that triggers a dismissal by a formal firm is given by,

$$\bar{\gamma}_F = [w_F - C (r + \lambda_F + q(\theta))] / A.$$

For informal firms, the trigger productivity is given by,

$$\bar{\gamma}_I = [w_I] / aA.$$

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<sup>9</sup> As pointed out by Lazear (1990), in a perfectly competitive market, the state-mandated severance pay could be undone given the proper contract. In particular, the worker would have to post a bond for the cost of the severance pay to the firm upon the signing of the contract. However, as in Lazear (1990), it is assumed that the state-mandated severance pay is not completely offset by a private transfer, because workers may be liquidity constrained and because of moral hazard problems on the part of firms.

Given firm-specific productivity and wages, the probability that a formal firm dismisses a worker is less than the probability that an informal firm dismisses, i.e.,  $\bar{\gamma}_F < \bar{\gamma}_I \Leftrightarrow G(\bar{\gamma}_F) < G(\bar{\gamma}_I)$ . This is both because formal firms must pay severance payments and because sector productivity is higher if producing formally.

### Determination of Wages

Wages are set by each firm-worker pair before the match-quality is realized. Wages are set according to Nash-bargaining, where each side has the same bargaining power. Thus, formal and informal firms split their surplus equally with workers, as follows:

$$J_F^e - V_F - G(\bar{\gamma}_F)C = E_F^e - U,$$

$$J_I^e - V_I = E_I^e - U,$$

where  $J_F^e$ ,  $J_I^e$ ,  $E_F^e$ , and  $E_I^e$  are the expected discounted profits of a formal and informal job and the expected lifetime utilities of a formal and an informal worker, respectively, and  $U$  is the expected lifetime utility of an unemployed worker. The asset equations of employed and unemployed workers are given by,

$$r E_s^e = w_s + \lambda (U - E_s^e),$$

$$r U = \theta q(\theta) (E^e - U).$$

Where  $E^e$  is the expected lifetime utility of employment for an unemployed job-seeker. Since an unemployed worker is uncertain about whether he will be hired in a formal or an informal job, his expected utility of employment is:

$$E^e = \text{Pr}(\text{formal offer}) [ (1 - G(\bar{\gamma}_F)) E_F^e + G(\bar{\gamma}_F) C ] + \text{Pr}(\text{informal offer}) (1 - G(\bar{\gamma}_I)) E_I^e.$$

Solving for  $(E_s^e - U)$  in each sector and substituting into the equal split equation above determines the wages in each sector:

$$w_F = \frac{\{ (r + \lambda_F)(r + \theta q(\theta)) [\int \gamma A g(\gamma) d\gamma - G(\bar{\gamma}_F) C] + r(r + \lambda_F + q(\theta)) \theta q(\theta) E^e \}}{\{ (2(r + \lambda_F) + q(\theta))(r + \theta q(\theta)) \}},$$

$$w_I = \frac{\{ (r + \lambda_I)(r + \theta q(\theta)) [\int \gamma A g(\gamma) d\gamma + r(r + \lambda_I + q(\theta)) \theta q(\theta) E^e \}}{\{ (2(r + \lambda_I) + q(\theta))(r + \theta q(\theta)) \}}.$$

Wages are expected to be higher in the formal sector because of the higher sector-productivity in formal jobs. However, as shown above, in equilibrium the average match-quality is lower in formal sector firms, as firms in this sector are more likely to keep less productive matches than informal firms. Hence, the lower quality of the matches in the formal sector lowers the expected wage in the formal sector. In addition, wages are affected not only by average productivity but also by the level of the firing cost. Both formal and informal wages are raised by the presence of state-mandated severance pay, because the severance payment raises workers' reservation wages.

### Sorting into Sectors

Given dismissal choices and wages, firms choose whether to sort into the formal or the informal sector. The benefit of producing formally is that the productivity of this sector is higher, but the cost of producing in this sector relative to the informal sector is the payment of state-mandated severance in the event of a dismissal. As firms are heterogeneous, firms may split between the two sectors. Firms produce formally if the difference between the expected stream of profits of formal and informal firms is positive, i.e., if  $[J_F^e - J_I^e] > 0$ , and they produce informally if it is negative, i.e., if  $[J_F^e - J_I^e] < 0$ . As the firm-specific productivity increases, the output gains in the formal sector relative to the informal sector increase. Thus, the gains from

going into the formal sector are greater for more productive firms than for less productive ones:

$$d[ J_F^e - J_I^e ] / dA = \int_{\gamma \in [\bar{\gamma}_F, \bar{\gamma}_I]} [ \gamma / (r + \lambda_F + q(\theta)) ] g(\gamma) d\gamma + \int_{\gamma \in [\bar{\gamma}_I, \bar{\gamma}_F]} [ a\gamma / (r + \lambda_I + q(\theta)) ] g(\gamma) d\gamma > 0.$$

Firms with  $A \in [\underline{A}, A_{\text{crit}}]$  produce in the informal sector, while firms with  $A \in [A_{\text{crit}}, \bar{A}]$  produce in the formal sector, where  $A_{\text{crit}}$  is the firm-specific productivity of the firm that is marginal between producing formally and producing informally. Consequently, since formal firms are more productive in equilibrium, they dismiss less often and they pay higher wages than informal firms.<sup>10</sup>

### C. Severance Pay and Turnover

The presence of state-mandated costs and higher productivity in the formal sector imply different hazards into and out of unemployment in the two sectors. On the one hand, the probability of endogenous dismissal in the formal sector is likely to be lower than the probability of dismissal in the informal sector, i.e.,  $\theta q(\theta)(1 - F(A_m))G(\bar{\gamma}_F) < \theta q(\theta)F(A_m)G(\bar{\gamma}_I)$ . On the other hand, the hiring probability will be higher or lower in the formal sector relative to the informal sector depending on the share of firms producing in each sector, i.e., depending on whether  $\theta q(\theta)(1 - F(A_m)) > \theta q(\theta)F(A_m)$  or  $\theta q(\theta)(1 - F(A_m)) < \theta q(\theta)F(A_m)$ . As the proportion of firms producing formally increases, then the hiring probability in the formal sector increases relative to the informal sector.

Moreover, the hazards into and out of unemployment are affected directly and indirectly by changes in severance pay legislation. First, a reduction in state-mandated severance pay has a direct effect on formal firms by increasing the threshold match-productivity that triggers dismissals. Second, a reduction of severance payments pushes down wages in both sectors due

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<sup>10</sup> The self-sorting of more productive firms into the formal sector, thus, makes evident the problems of identifying the effect of legislation on turnover, simply by estimating the effect of firing cost on the hazard rates.

to the fall in the reservation wage. Wages increase, however, due to the greater probability of dismissal in the formal sector, and the net effect on wages in both sectors is positive as well as the effect of wages on turnover. Finally, a reduction of severance payments changes the composition of firms in each sector. In particular, decreasing severance payments increases the incentives to produce in the formal sector and shifts lower productivity firms, that before were unwilling to produce formally, away from the informal sector. The compositional change increases the dismissal and hiring rates in the formal sector due to the greater share of firms producing formally.

The direct and indirect effects of a reduction in firing costs on turnover that emerge in the model illustrate the problems that may arise when trying to estimate the impact of a change in firing costs on turnover. First, the effects of firing costs on wages imply that the effect of firing costs on turnover captures not only the direct effect mentioned above, but also the indirect effect of firing costs on turnover going through wages. This is not problematic in so far as one is interested in measuring the total effect, both direct and indirect, of firing costs on turnover. However, the self-sorting of firms into formal and informal sectors according to their firm-specific productivity and the effect of the reduction of firing costs on this self-sorting are likely to introduce selection biases. Finally, if a policy change occurred simultaneously with a change in the distribution of the shocks, then one may attribute to the reform an effect that may indeed be due to a worsening in the distribution of the matches.<sup>11</sup> The next section discusses an identification strategy to deal with the problem of contemporaneous changes in the distribution of the shocks and discusses inference given the presence of a selection problem.

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<sup>11</sup> In addition, a change in firing costs is also likely to affect turnover in both sectors through its indirect effect on wages.

## V. Identification Strategy

### A. Differences-in-differences

The theory laid out above suggests that firing costs should only have direct effects on the exit rates of workers in the formal sector (covered by the legislation), but not on the exit rates of workers in the informal sector (uncovered by the legislation). Hence, the firing costs should only have direct effects on the tenures of formal sector workers, but not on the tenures of workers employed in the informal sector. Similarly, the unemployment duration of workers whose spells end as a result of being hired in the formal sector should be directly affected by firing costs, but not those of workers whose spells end as a result of being hired in the informal sector. Comparing the hazards into and out of unemployment (or tenures and unemployment spells) between formal and informal workers (covered and uncovered by the legislation) could then provide an estimate of the effect of firing costs on turnover. The sample counterpart of the firing cost effect on tenure (unemployment spells) using differences would be:

$$\Delta \bar{s} = [ \bar{s}^{\text{formal}} - \bar{s}^{\text{informal}} ],$$

where,  $\bar{h}^{\text{formal}} = 1 / \bar{s}^{\text{formal}}$  and  $\bar{h}^{\text{informal}} = 1 / \bar{s}^{\text{informal}}$  and the  $\bar{s}$ 's are mean tenures (unemployment spells) and the  $\bar{h}$ 's are mean hazard rates.<sup>12</sup> Considering the simplest possible model of tenure (unemployment duration) with no regressors, tenure (unemployment) depends only on a formal dummy,

$$s_{it} = \beta + \delta \text{Formal}_{it} + u_{it}, \quad E(u_{it} | \text{Formal}_{it})=0.$$

Given this model, it is easy to see that the difference of the mean tenures in the formal and informal sectors provides an estimate of the firing cost effect,  $\delta$ . This way of estimating the firing cost effect is, however, likely to be biased for three reasons. First, the two groups may

have different characteristics and, thus, different turnover behavior and different mean tenures and unemployment spells. Including regressors in the model above allows controlling for observable characteristics and helps to solve this problem. Second, the error term could be correlated with the Formal dummy if there is self-selection into the groups, i.e.,  $E(u_{it} | \text{Formal}_i=1) \neq E(u_{it} | \text{Formal}_i=0)$ . Finally, the two groups may be subject to different shocks and part of the differences in turnover patterns and, thus, tenures and unemployment spells, between the groups may be simply capturing these differences, i.e.,  $\beta_F \neq \beta_I$ .

Exploiting the temporal change in the legislation introduced by the labor market reform of 1990, in addition to the variability in coverage between covered and uncovered workers, allows controlling for self-selection and for the difference in shocks across groups. In the model of tenure (unemployment spells) with no regressors, tenure (unemployment) depends only on a formal dummy, on a post-reform dummy, and on an interaction term between the two,

$$s_{it} = \beta + \delta_0 \text{Formal}_{it} + \delta_1 \text{Post90}_{it} + \delta_2 \text{Formal}_{it} \times \text{Post90}_{it} + u_{it}$$

First, if self-selection is constant over time, i.e.,  $E(u_{i\text{pre}90} | \text{Formal}_i=1) = E(u_{i\text{post}90} | \text{Formal}_i=1)$  and  $E(u_{i\text{pre}90} | \text{Formal}_i=0) = E(u_{i\text{post}90} | \text{Formal}_i=0)$ , the firing cost effect can be estimated by simply taking differences-in-differences:

$$\Delta \bar{s}^{\text{gt}} = \Delta [ \bar{s}^{\text{post}90} - \bar{s}^{\text{pre}90} ]^{\text{formal}} - \Delta [ \bar{s}^{\text{post}90} - \bar{s}^{\text{pre}90} ]^{\text{informal}},$$

where,  $\bar{h}^{\text{gt}} = 1 / \bar{s}^{\text{gt}}$ . Taking differences of average tenures (unemployment duration) for formal workers between the pre-1990 and the post-1990 periods provides an estimate of the firing cost effect and allows to difference out the biases introduced by self-selection when self-selection is constant over time. Taking differences of these differences with respect to informal workers

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<sup>12</sup> This sample counterpart holds as long as the hazards follow a Poisson process.

(uncovered by the legislation) allows controlling for common trends that affect both groups, whether it is a constant trend,  $\beta$ , or a changing trend common to both groups,  $\delta_1$ .

As indicated above, however, it is possible that the two groups are subject to different shocks, i.e.,  $\beta_F \neq \beta_I$ . In this case, differences-in-differences would work provided that the post-reform shocks can be adjusted using pre-reform trends. Thus, differences-in-differences would work even if the trends were different in the two groups under two circumstances. First, differences-in-differences would work if the trends are constant over time for each group, i.e.,  $\beta_{Fpre90} = \beta_{Fpost90}$ ,  $\beta_{Ipre90} = \beta_{Ipost90}$ , and  $\delta_1 = 0$ . Second, differences-in-differences would also work if the trends change over time for each group, but the trends change by a common factor in both groups, i.e.,  $\beta_{Fpre90} \neq \beta_{Fpost90} = \beta_{Fpre90} + \delta_1$  and  $\beta_{Ipre90} \neq \beta_{Ipost90} = \beta_{Ipre90} + \delta_1$ .<sup>13</sup>

To estimate the effect of the reform on the hazard rates into and out of unemployment, the analogue of differences-in-differences is estimated using a formal hazard model. I estimate an exponential model that controls for observables and includes, the formal dummy, the post-1990 dummy and the interaction term between the formal and the post-1990 dummy:

$$h(s_{it} | \mathbf{X}_{it}, ) = \exp \{ \boldsymbol{\beta} \mathbf{X}_{it} + \delta_0 \text{Formal}_{it} + \delta_1 \text{Post90}_{it} + \delta_2 \text{Formal}_{it} \times \text{Post90}_{it} \},$$

where  $\mathbf{X}_{it}$  is a  $1 \times k$  vector of regressors, and  $\boldsymbol{\beta}$  is a  $k \times 1$  vector of parameters. The vector of covariates  $\mathbf{X}_{it}$ , includes: age, education, sex, marital status, number of dependants, the city where the person lives, and industry of employment. The Formal variable is included to control for constant differences between the groups. Thus,  $\delta_0$  is expected to be negative since the dismissal of formal workers is more costly than that of informal workers, both before and after

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<sup>13</sup> Moreover, even if trends do not change by a common factor in both groups, an unconventional differences-in-differences estimator could be obtained using a method proposed by Heckman and Robb (1985). This method assumes that a pre-reform model, that is stable over time, could be fit for each group and then used to quantify post-reform shocks that can be inserted into equations fit to post-reform data.

the reform. The Post90 dummy controls for common shocks affecting the turnover behavior of all workers after 1990. Finally, the interaction term of the Formal and Post90 dummies is included to estimate the effect of the reduction in firing costs introduced by the reform on the hazard rates. A test of the impact of the reform is equivalent to a test that the coefficient on the interaction term,  $\delta_2$ , is different from zero. In particular, the test considers whether workers covered by the legislation changed their turnover behavior relative to uncovered workers after 1990.

## **B. Potential Sources of Contamination**

The identification strategy above exploits both the temporal variability and the cross-section variability available in the Colombian context. Nonetheless, these differences-in-differences estimators rely on a number of assumptions that may yield inconsistent estimates of the effects of firing costs on turnover. First, the differences-in-differences estimators ignore the general equilibrium effects of a reduction in firing costs on composition suggested by the model in the previous section. Second, the estimators rely on the assumption that trends did not change differentially across groups over time. In turn, I consider the implications for the identification of the firing cost effect of having these two potential sources of biases.

As highlighted by the model in the previous section, the reduction of firing costs introduced by the reform is likely to have generated general equilibrium effects. In particular, the model above showed that a reduction in firing costs not only has direct effects on turnover by reducing the costs of dismissals, but it also has indirect effects on turnover through its impact on sector selection. As described above, the differences-in-differences estimator above is consistent as long as self-selection is constant over time. The model in the previous section showed, however, that a reduction in firing costs changes the incentives to sort into the formal and

informal sectors and generates compositional changes that also affect turnover. Thus, a reduction in firing costs may itself generate compositional changes that invalidate the assumption of a constant self-selection rule, before and after the reform. Yet, the model above does suggest that the bias introduced by differences-in-differences should be negative. In the model, the reduction in firing costs induces firms with low firm-specific productivities to start producing formally and the reallocation between sectors thus lowers the average firm-specific productivity and increases turnover in both sectors. However, the effect of this change in composition on turnover was shown to be greater in the informal sector. Thus, while the firing cost effect obtained with differences-in-differences is inconsistent, the estimate should be a lower bound of the effect of the reduction in firing costs on turnover. Moreover, the next section shows that the change in the size of the two sectors was small and this may indicate that the selection bias is unlikely to be large.

The second reason why the differences-in-differences estimators may yield inconsistent estimates of the firing cost effects is if the trends change differently over time for formal and informal workers. As discussed above, an important assumption that has to be fulfilled for differences-in-differences to yield consistent estimates of the reform is that it eliminates the effect of aggregate shocks or trends on turnover. The effect of aggregate shocks is eliminated if aggregate shocks are common to both groups, or if aggregate shocks are specific to each group but either, the shocks are constant over time or the shocks change similarly across groups. However, if trends are different across groups and they change differently over time, the firing cost effects obtained from differences-in-differences are likely to be biased. Aside from macro shocks, which are common to both groups, there were two additional shocks occurring during this period that could have affected by turnover. First, trade was liberalized during this period

and, second, a social security reform was introduced in the early 1990's.

Colombia's trade liberalization during the early 1990's should be expected to have increased instability for workers employed in tradable sectors after 1990. Nonetheless, trade shocks should have affected formal and informal firms alike and, hence, differences-in-differences should control for the effect of these shocks on turnover. If, however, formal firms were more likely to produce in tradable sectors and informal firms in non-tradable sectors, then differences-in-differences would yield upwardly biased estimates of the firing cost effect. Below, I estimate differences-in-differences across sectors to identify whether the changes in turnover were greatest in tradable sectors. There are two reasons to believe, however, that the trade shocks did not generate the differences in turnover over time presented below. First, the next section shows no consistent pattern across sectors in the differences-in-differences estimates. In addition, differences-in-differences for different firm sizes and age groups show that the change in turnover was greatest for large firms and middle age workers who should have been affected most by the changes in job security legislation, but not by trade shocks.

The social security reform introduced during the early 1990's affected formal firms but not informal firms. Thus, the social security reform introduced a shock affecting formal and informal firms differentially over time. As described above, the social security reform increased employers' health and pension contributions and, thus, increased non-wage labor costs for firms complying with the legislation. The increased variable costs should have reduced hiring and should have had no effect on dismissals in the formal sector relative to the informal sector. This means that the social security reform should have generated very different effects on turnover

from those predicted by a reduction in firing costs and from those reported in the next section.<sup>14</sup> Moreover, if firms adjusted to the increased non-wage labor costs by reducing wages, then the social security reform should not have had any turnover effects. There is evidence that employers tend to pass on their non-wage costs to workers as lower wages. For example, Gruber (1997) shows the sharp reduction payroll taxes that followed the privatization of Chile's social security system had no employment effects because wages adjusted fully to the change in non-wage costs. Moreover, differences-in-differences across different firm sizes and age groups show that turnover changed most among larger firms and middle age workers who should have been affected most by the changes in job security legislation, but not by the social security reform.

## **VI. Empirical Analysis**

This section examines the impact of the Colombian labor market reform of 1990, which included a substantial reduction in severance payments, on the hazard rates out of employment and out of unemployment of formal sector workers relative to informal sector workers.

### **A. The Data**

#### **A.1 Description**

The data to analyze the effects of the reform on the exit rates out of employment and out of unemployment are drawn from the Colombian National Household Surveys (NHS) for June of 1988, 1992, and 1996. The June NHS's were administered in seven metropolitan areas, including: Barranquilla, Bogota, Bucaramanga, Cali, Manizales, Medellin, and Pasto. The benefit of using the June surveys is that these include information on informality that allows to

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<sup>14</sup> See Kugler, Jimeno and Hernanz (2003) for an analysis of the differential effects of firing costs and payroll taxes on turnover and employment.

separate workers between formal sector workers (covered) and informal sector workers (uncovered). The June surveys allow defining workers as covered and uncovered in two ways. First, formal (covered) workers are defined as those workers whose employers make social security contributions and informal (uncovered) workers are defined as those whose employers do not contribute to the social security system. This definition is a useful one, because whether the employer contributes or not to social security is a good proxy of whether the employer generally complies or not with labor legislation. Second, formal (covered) workers are defined as wage-earners employed in firms with more than ten employees, and informal (uncovered) workers as wage-earners employed in firms with less than ten employees, family workers, domestic workers and the self-employed workers (excluding professionals and technicians). As discussed above, employers with five or less employees, family workers, and the self-employed are all exempt from severance pay legislation and domestic workers and workers in firms with low levels of capital are entitled only to half the amount of severance pay received by other employees. These surveys also include information on gender, age, marital status, educational attainment, number of dependents, city and sector of employment, that allows controlling for differences in turnover due to differences in characteristics across individuals. In addition, the surveys include information about whether the worker is permanent or temporary, which allows distinguishing the effect that the legislative change on temporary contracts had on turnover.

Table 3 presents summary statistics for the covered and uncovered groups (using the two definitions), before and after the reform. Columns 1 and 2 present the characteristics of formal (covered) workers and Columns 3 and 4 present the characteristics of informal (uncovered) workers, before and after the reform, respectively. Under both definitions, covered workers have more education, are slightly younger, have larger families, and are more likely to be married and

female and to have a permanent contract than uncovered workers. However, aside from the differences in educational attainment, the differences in characteristics between the two groups are small. In addition, the changes in characteristics of the two groups between the pre-1990 and the post-1990 periods have moved in the same direction and are similar in magnitude. Educational attainment, average age, and the share of married workers increased in both groups after 1990, while the share of men, the size of households, and the share of workers with permanent contracts decreased in both groups after 1990.

These summary statistics suggest that differences in composition between the groups are not substantial. Nonetheless, the differences in characteristics may account for part of the changing turnover patterns and, thus, raw differences in turnover between covered and uncovered groups should be interpreted carefully. For this reason, in the analysis below I estimate formal hazard models that allow controlling for individual characteristics. The use of these models is, thus, crucial for identifying the firing cost effect of the labor market reform. Another source of compositional bias may arise if, as highlighted by the model, the composition of firms changes over time. Table 3 shows an increase in the size of the formal (covered) sector after 1990, according to both definitions. The percentage of workers in the formal sector increased from 44.84% to 51.05%, according to definition 1, and from 41.47% to 45.22% according to definition 2, between the pre- and post-reform periods. The increase in the size of the formal sector, thus, indicates the importance of controlling also for firm characteristics, as the composition of formal firms may have also changed. Although the NHS's have little information on firm characteristics, the hazard models below do control for industry affiliation. Moreover, the fact that the increase in the size of the formal sector was small and that it cannot

be directly attributed to the reform suggests that the selection biases described above may not be of great concern.

## A.2. Sampling Plan

The June NHS's include information on tenure on the current job (in years) and on the duration of unemployment (in months) right before entering the current job that allow estimating hazard rates. In particular, the survey asks currently employed workers: How long have you been working on your current job?, and How long were you unemployed between your current job and your previous job? The data, thus, provides information on *incomplete* employment spells of *currently employed workers*, and on *complete* unemployment spells of workers who are *currently employed and had a previous job* (see graph below).

### June Waves:



The stock sampling for the employment spells generates two types of biases. First, the sampled employment spells are too short because of the sampling of *incomplete* employment spells. In particular, Heckman and Singer (1985) show that under the assumptions of a time homogenous environment, no heterogeneity, and independence between employment and unemployment spells, the completed spells would be on average twice as long. Second, as a consequence of sampling *currently employed* workers, the incomplete employment spells are

*longer* than the completed spells from a sample that follows workers flows from job-to-job over time. Thus, the sampling of currently employed workers introduces *length bias*. Heckman and Singer (1985) show, however, that under the assumptions stated above and, in addition, under the assumption of no duration-dependence the two biases exactly cancel out. Below, I estimate exponential hazard models that impose these assumptions.

Similarly, the stock sampling of the unemployment spells may also introduce a number of biases. Although the data provides complete unemployment spells, the fact that the spells are drawn from a sample of workers who are *currently employed and had a previous job* may generate biased estimates. First, sampling *currently employed* workers introduces length bias. This is because one oversamples workers with short spells relative to long spells. Thus, the mean of the sampled spells would be shorter than the mean of the spells from a flow sample. Second, sampling workers who *had a previous job* excludes all new entrants into the labor force and this introduces another type of length bias. By excluding new entrants from the sample, one oversamples workers with long spells relative to short spells, implying that the mean of the sampled spells would be shorter than the mean of the spells from a flow sample. Although, the distribution of unemployment spells obtained from this sampling plan is likely to be distorted, the bias due to stock sampling may be small in practice because the two biases have opposite signs and they may thus cancel out.

## **B. Tenure and Unemployment Spells, Before and After the Reform**

### ***Average Tenure***

The model presented above indicates that the direct and indirect effects of the reduction in firing costs introduced by the reform should have increased the exit rates out of employment for formal workers relative to informal workers. The reform should have, thus, reduced the

average tenure of workers covered by the reform (formal workers) relative to the tenure of uncovered workers (informal workers).<sup>15</sup>

Table 4 presents the average tenure for the covered and uncovered groups (using the first definition), before and after the Colombian Labor Market Reform of 1990.<sup>16</sup> The first row corresponds to the average tenure after the reform, the second row corresponds to the average tenure prior to the reform, and the third row to the differences. The last row provides the differences-in-differences estimate of the effect of the reform on tenure. The average tenure of covered workers decreased after the reform from 5.6002 to 5.3130 years. The decrease in average tenure for covered workers was of 3.4452 months and significantly different from zero. In contrast, the decrease in average tenure for uncovered workers was of 0.2112 months and not significantly different from zero. The differences-in-differences estimate of the effect of the reform was a reduction in average tenure of 3.6612 months. The effect is large, significantly different from zero, and, as predicted by the theory, most of the change comes from the reduction in average tenure of covered workers rather than from the increase average tenures of uncovered workers. Table 5 presents the difference-in-differences estimates of the reform on average tenure by gender. This table shows that most of the change in the aggregate figures is driven by the effect of the reform on men's tenures. The differences-in-differences estimate of the effect of the reform was a reduction of 4.1208 months for men and of 2.1012 months for women, although the effect is not significantly different from zero for women.

Tables 6 and 7 present differences-in-differences estimates of the reform for different age and education groups. Table 6 shows that the effect of the reform was greatest for middle age

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<sup>15</sup> In particular, the average tenure of formal workers should decrease because the fraction of workers with short tenures (those just hired) increases and/or the fraction of workers with long tenures (those just fired) decreases.

<sup>16</sup> This section and the rest of the analysis relies on the first definition of formal/informal since the two measures are highly correlated and the

workers. The differences-in-differences estimate of the effect was a reduction of 4.0176 months for middle age workers, while the estimates for young and older workers were not significantly different from zero. These results are consistent with the change in severance pay legislation and with the change in ‘unjust’ dismissal legislation that raised the cost of ‘unjustly’ dismissing workers with more than ten years of tenure. In particular, the change in the legislation should have induced firms to dismiss workers just prior to completing ten years of tenure. This result is confirmed in the next section with the formal hazard analysis. In contrast, Table 7 shows that the difference-in-differences estimates of the effects of the reform were greatest for employees with primary education and with a university degree or more. This result, however, inverts in the formal hazard analysis that controls for changes in turnover for these groups after the reform.

Table 8 shows the differences-in-differences estimates of the effect of the reform by sector, to identify whether the reduction in tenures could have been the result of trade liberalization. This table shows that the difference-in-differences estimates for agriculture, mining, manufacturing, construction, and commerce are not significantly different from zero at conventional levels. Moreover, the differences-in-differences estimate of the reform was a reduction of 6.4836 months in transportation, but only significant at the 10% level, a reduction of 10.7028 months in financial services, only significant at the 5% level, and a reduction of 10.236 months in services, significant at the 1% level. Thus, the estimates by sector do not show a consistent pattern of changes across tradable and non-tradable sectors. These results are confirmed by the formal hazard analysis presented below. Moreover, consistent with the changes predicted by the labor market reform, the changes that are significant are driven by

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results are robust to the definition used.

reductions in the tenures of covered workers and not by the increase in tenures of uncovered workers.

Table 9 shows the differences-in-differences estimates by firm size. The results show that the effects of the reform were greatest for larger firms, as predicted by the changes in the legislation. The differences-in-differences estimates for the self-employed and for workers employed in firms with 2-5 employees and in firms with 5-10 employees are not significantly different from zero. In contrast, the estimate of the effect of the reform for workers employed in firms with more than ten employees was a reduction of 6.3372 months. The effect of the reform on workers employed by large firms is big, significantly different from zero, and driven mainly by a reduction of tenures of covered workers rather than by an increase of the tenures of uncovered workers. This evidence is strongly consistent with the expected effects of a reduction in firing costs, since the self-employed and workers employed in firms with less than 5 employees are completely exempt from severance and workers employed in firms with little capital are only entitled to partial severance payments.

### ***Unemployment Duration***

The model predicts that a reduction in dismissal costs should increase the exit rate out of unemployment and into formal jobs relative to the exit rate out of unemployment and into informal jobs. Thus, the reduction in severance payments would be expected to shorten unemployment spells of workers hired into formal jobs relative to those of workers hired into informal jobs.<sup>17</sup>

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<sup>17</sup> In particular, the average unemployment spell of those going into formal jobs should decline because of the increased probability of being hired into a formal firm should reduce the fraction of workers with long spells. Moreover, the fraction of workers with short spells (those just fired from formal jobs) increases.

Table 10 presents the differences-in-differences estimates of unemployment spells.<sup>18</sup> The average unemployment spell for workers whose spell ended with a formal sector job increased. However, the average unemployment spell of workers whose spell ended in an informal sector job lengthened by even more than that of formal workers. Thus, the differences-in-differences estimate was a reduction in the average unemployment spell of 3.1108 weeks and significantly different from zero.<sup>19</sup> Table 11 presents the results for men and women, separately. The differences-in-differences estimate for men was not significantly different from zero, but the effect on women was a shortening of the average unemployment spell of 7.9672 weeks and significant at the 1% level. Table 12 presents the differences-in-differences estimates for different age groups and Table 13 presents the differences-in-differences estimates for different education groups. The results show that unemployment spells decreased most for young and middle aged workers. This result is consistent with the expectation that a decrease in firing costs should increase hiring, especially for outsiders, and is also confirmed in the formal hazard analysis below. Moreover, Table 13 shows that the differences-in-differences estimates are greatest for workers with incomplete secondary and incomplete university education. Thus, the firing cost effect on hiring appears to be greater on workers that are risky hires. This is also confirmed below by the formal hazard analysis.

Table 14 presents the differences-in-differences estimates of the effect of the reform on unemployment spells by industry. The differences-in-differences estimates are not significantly different from zero in agriculture, mining, manufacturing, utilities, construction, transportation,

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<sup>18</sup> Unemployed workers are defined as formal if the job subsequent to their spell was in the formal sector and as informal if their job subsequent to the spell was in the informal sector.

<sup>19</sup> Contrary to the results for tenure, the differences-in-differences results for unemployment spells are driven mainly by the lengthening of the spells of those exiting into the informal sector. This is however, consistent with the model presented above. On the one hand, the model predicts that the probability of being hired in the formal sector should rise after the reform because of the increase in the number of firms producing in this sector. On the other hand, the probability of being hired into the informal sector falls unambiguously.

and financial services. Only the effect on commerce and services are significantly different from zero. The differences-in-differences estimate of the effect of the reform was a reduction of 1.2746 weeks of the unemployment spell in commerce, but only significant at the 5% level and a reduction of 1.3126 weeks of the unemployment spell in services, significant at the 1% level. Thus, as for tenure, the results do not show a consistent pattern of a differential impact on tradable and non-tradable sectors. In contrast, the differences-in-differences estimates by firm size in Table 15 provide some evidence that the firing cost effect was greatest among larger firms. In particular, the differences-in-differences estimates of the reform on firms with 5 –10 employees and on firms with more than ten employees indicate reductions of the average unemployment spell of 0.8038 weeks and of 0.2913 weeks, respectively. Although neither effect is significant at conventional levels, the p-values for the differences-in-differences estimates of larger firms are greater than the p-values for the estimates of the self-employed and of firms with 2-5 employees.

### **C. Employment and Unemployment Survivor Functions, Before and After the Reform**

While the previous section presented the implied effects of the reform on tenure and unemployment spells, this section presents evidence on the effects of the reform on the survival probabilities in employment and unemployment. If the reduction of dismissal costs introduced by the reform, indeed, was important, then the probability of survival in a formal job should had fallen after the reform relative to the probability of survival in an informal job. In addition, if the reduction in dismissal costs generated more hiring, then the probability of survival in unemployment should had fallen after the reform for workers exiting into formal jobs relative to those exiting into informal jobs.

Figure 1 presents the Kaplan Meier survival estimates for employment. This figure includes the probabilities of survival for formal and informal workers before and after the reform. The figure shows that the probability that a formal job lasts more than two years decreased after the reform. For tenures of more than two years, the survivor function of formal workers after the reform (Formal/Post-1990) shifts down with respect to the survivor function of formal workers before the reform (Formal/Pre-1990). However, for tenures of less than two years, the survivor function of formal workers after the reform shifted up with respect to the survivor function of formal workers before the reform. That survivor function is greater for formal workers with less than two years of tenure after the reform is surprising, given the extension by the reform of the use of temporary contracts for less than a year. However, this shift in the survivor function for those with less than two years of tenure may simply reflect the greater hiring of new permanent workers after the reform, as is shown below in the estimation of formal hazard models. The downward shift of the survivor function of formal workers after the reform is consistent with the reduction in dismissal costs for formal firms after the reform. In contrast, however, Figure 1 shows, that the probability of survival increased slightly for informal workers after the reform relative to informal workers prior to the reform. The survivor function of uncovered workers after the reform (Informal/Post-1990) shifted up slightly with respect to the survivor function of uncovered workers before the reform (Informal/Pre-1990). If common shocks to both groups were responsible for the decreased probability of survival of formal jobs, then the figure should also show a downward shift of the survivor function for informal workers. Moreover, consistent with the fact that formal workers are covered by job security regulations while informal workers are not, the survivor functions for formal workers are higher than the survivor functions of informal workers both before and after the reform. The survivor functions

for the covered and uncovered groups, as well as the shifts of the survivor functions for each group after the reform, are, thus, consistent with the predicted effects of firing costs and with the predicted effects of the reform on formal turnover.

Standard Kaplan-Meier survival functions of unemployment show a similar change after the reform. Figure 2 shows that the unemployment survival functions of formal hires shifted down between the pre-reform (Formal/Pre-1990) and post-reform (Formal/Post-1990) periods. Thus, for every unemployment spell of duration  $t$ , the probability of remaining unemployed decreased after the reform for those who exited into formal employment. On the contrary, Figure 2 shows that the unemployment survival functions increased slightly for informal workers, after the reform. These shifts are consistent with the expected effects of the reform. The reduction of firing costs would have predicted that the probability of remaining unemployed at every time  $t$  should have decreased for workers covered by the reform but not for uncovered workers. Moreover, the next section shows, that the escape rates into and out of unemployment increased for formal workers relative to informal workers, even after controlling for observable characteristics.

#### **D. Formal Hazard Models**

It is possible that the employment and unemployment spells and the survivor functions presented above changed after the reform due to changes in the characteristics of workers and jobs after 1990. Thus, below I estimate formal duration models that allow controlling for the effects of changes in worker and job characteristics on exit hazard rates.

As described in Section IV, I estimate exponential hazard models that control for age, education, marital status, city, industry of employment, and the number of dependents. More importantly, these formal hazard models can capture the effects of the reform. The models

include a Formal dummy that controls for differential turnover patterns across groups, a Post90 dummy that captures the differential turnover pattern in turnover after 1990 for all groups, and an interaction term of the Formal and Post90 dummies that captures the effect of the reform. In particular, the coefficient of the interaction term can be interpreted as the differential hazard rates of covered workers after the reform was introduced. Moreover, to further probe the importance of the reform, other specifications of the model are included to test whether the effects of the reform showed the expected patterns for different groups. In addition, to test the importance of trade shocks, a specification of the model that includes interaction terms of the Formal  $\times$  Post90 dummy with sector dummies is also estimated.

Table 16 shows the results of the estimation of exponential exit hazard rates out of employment. Column (1) presents the estimates obtained from the basic specification of the model that includes the covariates mentioned above, the Formal dummy, the Post90 dummy, and the interaction term of the two. The results show the expected signs. The hazards are higher for younger, more educated, female, and single workers and for workers with smaller number of dependents. The results also show that the hazards out of employment decreased during the post-1990 period for informal workers. Moreover, as expected, formal workers, who are covered by the legislation, have lower hazards out of employment than do informal workers. Most importantly, the coefficient on the interaction term is positive and significant at the 1% level. In particular, the coefficient indicates that, after the reform, covered workers are 6.17% more likely to exit employment than are uncovered workers. This result, thus, suggests that the reduction in firing costs introduced by the reform increased the exit rates out of employment substantially. Exit hazards out of employment are likely to have increased after the reform both because of the

increase in dismissals and because of the increase in quits resulting from greater hiring after the reform.

Another essential feature of the reform was the greater flexibility in the use of temporary (fixed-term) contracts and, thus, one may suspect that a great deal of the increases in turnover after the reform may simply be the result of increased hiring of temporary workers in the formal sector. The specification in Column (2) allows to distinguish whether the increase in the exit rates out of employment was purely the result of the increase in the use of temporary contracts or if the reduction in the cost of firing permanent workers also played a role. Column (2) in Table 16 presents the estimates of a model including, a permanent dummy, an interaction term of the Post90 dummy and the permanent dummy, an interaction term of the Formal dummy and the Permanent dummy, and an interaction of the Formal  $\times$  Post90 dummy with the Permanent dummy.<sup>20</sup> All the coefficients have the same signs as before and the coefficient on the Permanent dummy is negative and significant at the 1% level, as expected. The results show that the coefficient on the Formal  $\times$  Post90 interaction is positive, but the interaction term of the Formal  $\times$  Post90 dummy with the Permanent dummy is negative and significant at the 1% level. The results indicate that, after the reform, the probability of exiting employment was 6.7% higher for temporary workers in the formal sector than for temporary workers in the uncovered sector. At the same time, the probability of exiting employment was 6.1% higher for permanent worker in the formal sector than for permanent workers in the uncovered sector after the reform. Thus, while the introduction of temporary contracts does appear to explain part of the increased turnover of formal workers, the results also suggest that the reduction of dismissal costs for permanent workers also contributed to increasing turnover.

Column (3) in Table 16 presents the results of specifications including interaction terms of the reform effect with the age and education variables. This specification of the model allows seeing whether the impact of the reform was greater on the groups that would be expected to be affected most by the changes in the legislation. First, since the reform increased the costs of dismissing workers with more than ten years of tenure, then the impact of the reform would be expected to be greater for groups with less than ten years of tenure (i.e., younger workers). Second, the special contracts introduced by the reform, which exempted workers with more than ten times the minimum wage from severance payments, would be expected to affect mostly the turnover of highly educated workers who are likely to earn more than ten times the minimum wage. Column (3) shows that, indeed, the hazard rates of younger and middle-aged workers increased by more than the hazards of older workers. Young workers with secondary education hired in the formal sector were 4.1% more likely to exit employment than did younger informal workers with secondary education after the reform. Similarly, middle-aged formal workers with secondary education were 7.9% more likely to exit employment than did middle-aged informal workers with secondary education after the reform. The smallest impact of the reform was on older formal workers, who were only 1.8% more likely to exit employment than did older informal workers after the reform. These results are thus consistent with lower expected dismissals of workers with more than ten years of tenure. Moreover, the results also indicate that the impact of the reform was greater on more educated workers who are more likely to have benefited from the use of “Integral Salary” contracts. The exit rate of middle-aged formal workers with a primary education increased by 6.6% after the reform relative to middle-aged informal workers with the same level of education. The exit rate of middle-aged formal workers

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<sup>20</sup> The permanent dummy takes the value of 1 if the worker is a permanent worker and zero if the worker is temporary.

with secondary, a high school degree and university education increased by 7.9%, 12.5%, and 13.1% after the reform relative to middle-aged informal workers with the same levels of education. In contrast, the hazard out of employment increased only by 3.8% for middle-aged formal workers with more than a university degree after the reform relative to middle-aged informal workers with the highest educational attainment. The impact was, thus, smallest among the least and the most educated. The small impact on these groups may be due to the fact that these workers have longer tenures and, thus, are more likely to have been affected by the increase in the costs of ‘unjust’ dismissals for tenures of more than ten years.

While the above patterns are consistent with the effects of the labor market reform on different groups, it may be that part of the increased turnover is the result of trade shocks affecting various groups differently. Column (4) in Table 16 presents the results from an exponential hazard model that includes interaction terms of the Formal  $\times$  Post90 dummy with sector dummies. The idea is that if trade liberalization were responsible for the increased turnover after the labor market reform, then the observed impact would be greater on workers employed in tradable sectors than on those employed in non-tradable sectors. The results from Column (4) in Table 16 show that the increase in turnover of covered workers after the reform was greater in utilities, transportation, construction and services. The probability of exiting formal employment in these sectors after the reform was 640%, 15.7%, 12.3%, and 17.6% greater than the probability of exiting informal employment in these sectors. However, if the trade shocks were a main source of the increased turnover, it would be expected that the exit rate out of employment would have increased more for workers hired in trade-intensive sectors such as commerce and manufacturing. In fact, after the reform formal workers in commerce were only 2.5% more likely to exit employment than informal workers in this sector were. Moreover,

the probability of exiting employment was 1% lower after the reform for formal workers relative to informal workers hired in manufacturing. The results from the exponential hazard model, thus, do not provide any reason to believe that trade liberalization increased turnover for covered workers after 1990.

Table 17 includes the results of exponential hazards out of unemployment. Given the reduction of mandated firing costs, one would expect greater hiring in the covered sector and, thus, an increase in the escape rate out of unemployment for workers hired into formal sector jobs. Column (1) shows that, indeed, the exit hazard out of unemployment increased by 5.75% for covered workers after the reform relative to uncovered workers.<sup>21</sup> Moreover, while the extension of temporary contracts appears to explain part of the increased hiring, most of the increase in the exit hazards out of unemployment is due to the increased hazards into permanent jobs in the formal sector. The results from Column (2) in Table 17 show that the escape rate out of unemployment increased by 4% for formal temporary workers after the reform relative to temporary informal workers. However, the exit rate out of unemployment increased by even more for formal permanent workers after the reform, thus indicating that the reduction in dismissal costs of permanent workers did increase the incentives to hire this type of workers. The results show that the probability of exiting unemployment and entering a formal permanent job increased by 6.1% after the reform relative to the probability of entering an informal permanent job.<sup>22</sup>

Column (3) in Table 17 presents the results of the exponential hazard model including interaction terms of the reform effect with the age and education variables. The estimates from

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<sup>21</sup> The sign on the formal dummy is positive and significant at the 1% level. This could be explained if unsuccessful discouraged workers who get tired of searching for formal work turned to the informal sector as a last resource.

this model show that, as for the hazards out of employment, the impact of the reform was greater on younger and more educated workers. The reform should have had greater effects on the exit rates out of unemployment for younger workers if the reduction in dismissal costs decreased the power of insiders and induced more hiring of young outsiders. In fact, the exit rate out of unemployment and into formal jobs for young workers increased by 25.8% after the reform relative to the exit rate into informal jobs. The exit rate into formal jobs for middle-aged workers also increased after the reform but not by as much. In particular, the hazard rate out of unemployment and into formal jobs increased by 3.9% for middle-aged workers relative to informal workers. In contrast, the hazard rates out of unemployment and into formal jobs decreased by 11.1% for older workers after the reform, relative to those entering informal jobs. In addition, these results show that the impact of the reform on exit hazard rates out of unemployment was greatest on the more educated. This is to be expected, given that these workers are the ones more likely to opt for the “Integral Salary” contract that exempts workers from severance and other dismissal costs. In fact, the hazards out of unemployment and into formal jobs decreased after the reform by 10% relative to the hazard out of unemployment and into informal jobs for workers with primary education and by 3.9% and 1.2% for workers with secondary schooling and a high school degree, respectively. In contrast, after the reform, the exit rates out of unemployment and into formal jobs increased by 37% for university graduates and by 12% for workers with more than a university degree relative to the exit rates into informal jobs.

Finally, Column (4) in Table 17 shows the results of the hazard model with sector dummy and reform interactions. The results show that the increase in the exit rates out of

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<sup>22</sup> The sign on the permanent dummy is positive and significant at the 1% level. Similarly to the description in footnote 17, this is probably due

unemployment after the reform was greater for workers exiting into formal sector jobs in mining, utilities, and services. The probability of exiting unemployment into formal employment in these sectors after the reform was 45.7%, 27.6%, and 10.9% greater than the probability of exiting unemployment into informal employment in these sectors. However, the probability of exiting unemployment into formal employment in trade-intensive sectors such as commerce and manufacturing was only 2.8% and 6.7% higher than the probability of exiting unemployment into informal employment in these sectors. As the results from the employment hazard models, these results from the unemployment hazard model, thus, do not provide evidence indicating the importance of trade liberalization in increasing worker turnover after 1990. Instead, the increased hazards in utilities and services, which are more likely to be public sector jobs covered by the legislation, indicates to the importance of the labor market reform in generating these patterns in turnover.

## **VII. Worker Turnover and Unemployment**

The previous section showed that the functioning of labor markets changed substantially in Colombia after the introduction of the labor market reform of 1990. In particular, the estimates from the formal hazards show that, after controlling for observable characteristics, the post-reform period was characterized by higher exit rates into and out of unemployment in the formal sector relative to the informal sector.

While the results in the previous section indicate that the reform increased labor market flexibility by increasing the flows into and out of unemployment, the net effects of the reform on employment and unemployment are ambiguous. In this section, I use the steady state condition of the model in Section IV, together with the hazard rate results obtained in Section VI, to obtain

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discouraged workers who are unsuccessful finding a permanent position turning to temporary jobs as a last resource.

a rough estimate of the net effect of the reform on unemployment.

In the model above, a steady state condition has to be satisfied such that the flow into unemployment from both sectors must equal the flow out of unemployment and into both sectors:

$$\lambda_F e_F + \theta q(\theta)(1-F(A_m))G(\bar{\gamma}_F)u + \lambda_I e_I + \theta q(\theta)F(A_m)G(\bar{\gamma}_I)u = \theta q(\theta)(1-F(A_m))u + \theta q(\theta)F(A_m)u.$$

Substituting for employment in each sector,  $e_F = (1-F(A_m))e$  and  $e_I = F(A_m)e$ , and for the identity,  $e + u = 1$ , and solving for  $u$  yields the following formula for the unemployment rate,

$$u = [(1-F(A_m))\lambda_F + F(A_m)\lambda_I] / [(1-F(A_m))\lambda_F + F(A_m)\lambda_I + (1-F(A_m))\theta q(\theta)(1-G(\bar{\gamma}_F)) + F(A_m)\theta q(\theta)(1-G(\bar{\gamma}_I))].$$

The unemployment rate can be estimated from this equation by substituting for the average hazard rates into and out of unemployment during the pre-reform period and the shares in each sector. The average hazard rates are estimated with the average tenure and unemployment spells in Tables 4 and 10, which indicate an average tenure of 67.2 and 54.2 months in the formal and informal sectors and average unemployment spells of 1.8 and 2.2 months in the formal and informal sectors during the pre-reform period. The shares of formal and informal employment are reported in Table 1. Before the reform, the shares of formal and informal employment were 0.45 and 0.55, respectively. After the reform, the shares of formal and informal employment changed to 0.51 and 0.49, respectively. Finally, Tables 16 and 17 show an increase in the hazards into an out of unemployment of 6.17% and 5.75%.

As the model abstracts from many factors affecting labor markets, the estimated unemployment obtained from the formula above should not be interpreted as precise estimates of the unemployment rate, but rather as an indication of the magnitude of the changes in unemployment rates between the two periods. For example, taking into account other flows such

as retirements, new entries into the labor market, and deaths, the unemployment rate is:

$$u = \frac{\xi + \psi + \sigma + (1-F(A_m))\lambda_F + F(A_m)\lambda_I}{\xi + \psi + \sigma + (1-F(A_m))\lambda_F + F(A_m)\lambda_I + (1-F(A_m))\theta q(\theta)(1-G(\bar{\gamma}_F)) + F(A_m)\theta q(\theta)(1-G(\bar{\gamma}_I))},$$

where  $\xi$ ,  $\psi$ , and  $\sigma$  are the flows due to retirements, new entries, and deaths, which are estimated assuming a working life of 35 years, entry at 18 years of age, and a life expectancy of 60 years for those that die before retiring.

The unemployment rate for the pre-reform period obtained with this formula is 4.84%, which is lower than the true unemployment rate of 11.8% in Colombia in 1988. The post-reform unemployment rate estimated with the post-reform shares is 4.69%, which is also a lower than the true unemployment in 1992 and 1996, 10.2% and 10%, respectively. These results suggest a reduction in unemployment of 0.15% points between the pre- and post-reform periods, compared to the actual reduction in unemployment of 1.6% between 1988 and 1992 and of 1.8% between 1988 and 1996. These results suggest the reform contributed to about 10% of the reduction in the unemployment rate between the pre- and post-reform periods.

### VIII. Conclusion

The Colombian labor market reform of 1990 provides an interesting quasi-experiment to analyze the effects of a reduction in firing costs. This study exploited the temporal change in the legislation together with the difference in coverage between formal and informal workers to analyze the impact of the reform on worker turnover. The differences-in-differences estimates indicate that the reform increased the dynamism of the Colombian labor market, by increasing the exit rates into and out of unemployment. Moreover, aside from contributing to increase mobility in the labor market, the reform is also likely to have contributed to increase compliance with labor legislation by lowering the costs of formal production. The increased churning in the

labor market and the greater compliance with the legislation are estimated to have contributed to about 10% of the reduction in the unemployment rate from the late 1980's to the early 1990's. At the same time, the reform is likely to explain in part the recent surge in the unemployment rate during the late 1990's. This is because the greater flexibility in hiring and firing after the reform is likely to translate in increased hiring relative to firing during expansions but in increased firings relative to hiring during recessions.

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**Table 1: Indemnities for ‘Unjust’ Dismissal by Tenure**

	Pre- And Post-Reform			Pre-Reform	Post-Reform
	Less than a Year	≥1 and <5 years	≥5 and <10 years	≥10 years	≥10 years
<b>Dismissal Costs</b>	45 days	45 days and 15 Additional days After the first year.	45 days and 20 additional days After the first year.	45 days and 30 additional days after the first year.	45 days and 40 additional days After the first year.

**Table 2: Advance Notice Requirements by Firm Size**

Firm Size	Threshold for Advance Notification of Collective Dismissals
>10 and <50 employees	30% of the workforce
≥50 and <100 employees	20% of the workforce
≥100 and <200 employees	15% of the workforce
≥200 and <500 employees	9% of the workforce
≥500 and <1,000 employees	7% of the workforce
≥1,000 employees	5% of the workforce

**Table 3: Basic Characteristics of Formal and Informal Workers,  
Before and After the Reform**

	Formal		Informal	
	Pre-reform	Post-reform	Pre-reform	Post-reform
<b>Definition 1 of Informality</b>				
Share of Total Employment	44.84 %	51.05 %	55.16 %	48.95 %
Share of Permanent Workers	90.66%	88.84%	77.64%	74.5%
Share of Men	68.69 %	64.95 %	69.6 %	67.56 %
Share of Married Workers	69.79 %	73.38 %	68.1 %	72.17 %
Average Education	8.9 years	9.74 years	6.1 years	6.67 years
Average Age	35.52 years	35.87 years	36.01 years	36.54 years
Average No. of Dependants	0.81 persons	0.72 persons	0.80 persons	0.78 persons
<b>Definition 2 of Informality</b>				
Share of Total Employment	41.47%	45.22%	58.63%	54.78%
Share of Permanent Workers	86.6%	84.95%	81.27%	79.24%
Share of Men	70.53%	66.8%	68.24%	65.75%
Share of Married Workers	69.71%	72.43%	68.39%	73.09%
Average Education	8.93 years	9.79 years	6.29 years	6.95 years
Average Age	34.7 years	35.02 years	36.57 years	37.17 years
Average No. of Dependants	0.84 persons	0.77 persons	0.78 persons	0.73 persons

Notes: the table reports proportions and means of the variables in the formal and informal sectors before and after the reform using two alternative definitions of informality. The proportions and means using the first definition are presented in the top panel, while those using the second definition are presented in the bottom panel. Under definition 1, workers are defined as those whose employers pay social security taxes and informal workers are those whose employer does not pay social security contributions. Under definition 2, formal workers are defined as wage-earners employed by firms with more than 10 employees and informal workers are wage-earners employed by firms with less than 10 employees, family workers, domestic workers, and self-employed workers. In Colombia, family workers, self-employed, and workers employed by firms with less than 5 employees are completely exempt from severance pay legislation, while domestic workers and workers employed by firms with little capital are subject to half the severance payments of workers completely covered by the legislation.

**Table 4: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Tenure**

	<b>Formal</b>	<b>Informal</b>
<b>Post-reform</b>	5.3130 (0.0461)	4.5376 (0.0496)
<b>Pre-reform</b>	5.6002 (0.0632)	4.5197 (0.0588)
<b>Differences</b>	-0.2872* (0.0782)	-0.0176 (0.0769)
<b>Differences-in-Differences</b>		- 0.3051** (0.1098)

**Table 5: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Tenure, by Gender**

	<b>Men</b>		<b>Women</b>	
	<b>Formal</b>	<b>Informal</b>	<b>Formal</b>	<b>Informal</b>
<b>Post-reform</b>	5.57424 (0.0610)	4.9987 (0.0636)	4.5173 (0.0659)	3.5772 (0.0749)
<b>Pre-reform</b>	6.1141 (0.0812)	5.0270 (0.0753)	4.4730 (0.0914)	3.3577 (0.0842)
<b>Differences</b>	-0.3717* (0.1016)	-0.0283 (0.0986)	0.0443 (0.1127)	0.2194** (0.1127)
<b>Differences-in-Differences</b>	-0.3434* (0.1416)		-0.1751 (0.1594)	

**Table 6: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Tenure, by Age Group**

	Age < 24 years		24- 55 years		Age > 55 years	
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	1.6480 (0.0331)	1.4058 (0.03030)	5.3971 (0.0821)	4.5180 (0.0525)	11.2889 (0.2860)	10.1111 (0.2523)
<b>Pre-reform</b>	1.6107 (0.0394)	1.3709 (0.0309)	5.7419 (0.0663)	4.5280 (0.0615)	12.3513 (0.3589)	10.7321 (0.3008)
<b>Differences</b>	0.0372 (0.0515)	0.0349 (0.0433)	-0.3448* (0.0821)	-0.0100 (0.0808)	-1.0624* (0.4589)	-0.6209† (0.3926)
<b>Diff's-in-diff's</b>	0.0023	(0.0684)	-0.3348* (0.1156)		-0.4414	(0.2111)

**Table 7: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Tenure, by Education Group**

	Primary Education		Secondary Education		High School	
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	6.0542 (0.1115)	5.1540 (0.0816)	4.9525 (0.0911)	3.8160 (0.0745)	4.7533 (0.0785)	3.9912 (0.1046)
<b>Pre-reform</b>	6.6346 (0.1316)	5.0796 (0.0862)	4.8250 (0.1105)	3.6165 (0.0963)	4.9365 (0.1222)	4.0059 (0.1451)
<b>Differences</b>	-0.5803* (0.1724)	0.0744 (0.1187)	0.1275 (0.1432)	0.1996** (0.1218)	-0.1832† (0.1453)	-0.0147 (0.1788)
<b>Diff's-in-diff's</b>	-0.6547* (0.2111)		-0.0720 (0.1867)		-0.1685 (0.2380)	
	University Education		University Degree or more			
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	4.6618 (0.1242)	3.4520 (0.1714)	6.2258 (0.1208)	5.2305 (0.2575)		
<b>Pre-reform</b>	5.0506 (0.1771)	3.6039 (0.2505)	6.3984 (0.1871)	4.9899 (0.3093)		
<b>Differences</b>	-0.3888** (0.2163)	-0.1519 (0.3035)	-0.1726 (0.2227)	0.2407 (0.4024)		
<b>Diff's-in-diff's</b>	-0.2368 (0.4018)		-0.4133 (0.4923)			

**Table 8: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Tenure, by Industry**

	Agriculture		Mining		Manufacturing	
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	5.6232 (0.3975)	5.0688 (0.4503)	5.8725 (0.4731)	4.1875 (0.8474)	5.3031 (0.0915)	4.2360 (0.1128)
<b>Pre-reform</b>	5.724 (0.6194)	6.0402 (0.4503)	4.4010 (0.5431)	3.4091 (0.7922)	5.0920 (0.1164)	4.3843 (0.1438)
<b>Differences</b>	-0.1008 (0.7359)	-0.9714 (0.6947)	1.4716** (0.7245)	0.7784 (1.1601)	0.2112 <sup>†</sup> (0.1481)	-0.1483 (0.1827)
<b>Diff's-in-diff's</b>	0.8706	(1.0964)	0.6931	(1.3608)	0.3595	(0.2341)
	Utilities		Construction		Commerce	
<b>Post-reform</b>	6.8926 (0.3778)	-	4.0121 (0.1859)	4.2889 (0.1729)	4.5763 (0.0823)	4.9136 (0.0862)
<b>Pre-reform</b>	7.9114 (0.4736)	-	4.0532 (0.2558)	3.4439 (0.1904)	4.6654 (0.1217)	4.9855 (0.1001)
<b>Differences</b>	-1.0188* (0.6059)	-	0.0411 (0.3163)	0.8449* (0.2572)	-0.0892 (0.1469)	-0.0719 (0.1321)
<b>Diff's-in-diff's</b>	-	-	-0.8861	(0.4382)	-0.0173	(0.2046)
	Transportation		Financial Services		Services	
<b>Post-reform</b>	5.22 (0.1766)	4.5496 (0.1564)	4.8835 (0.1364)	5.1026 (0.2744)	6.2118 (0.0992)	4.2454 (0.0985)
<b>Pre-reform</b>	6.1895 (0.2455)	4.9789 (0.2144)	5.6848 (0.2072)	5.0121 (0.3692)	6.8428 (0.1332)	4.0234 (0.1053)
<b>Differences</b>	-0.9695* (0.3025)	0.4292** (0.2654)	-0.8013* (0.2480)	0.0905 (1.2636)	-0.6310* (0.1661)	0.2220 <sup>†</sup> (0.1442)
<b>Diff's-in-diff's</b>	-0.5403 <sup>†</sup>	(0.4009)	-0.8919**	(0.4961)	-0.8530*	(0.2189)

**Table 9: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Tenure, by Firm Size**

	Self-employed		Firms 2-5 employees	
	Formal	Informal	Formal	Informal
<b>Post-reform</b>	6.2577 (0.1868)	5.8356 (0.1333)	4.9708 (0.1372)	4.1192 (0.0804)
<b>Pre-reform</b>	6.4868 (0.3235)	5.7927 (0.1014)	5.0944 (0.1826)	4.1052 (0.0931)
<b>Differences</b>	-0.2291 (0.3736)	0.0426 (0.1333)	-0.1237 (0.2284)	0.0139 (0.1230)
<b>Diff's-in-diff's</b>	-0.2718 (0.3734)		-0.1377 (0.2514)	
	Firms 5-10 employees		Firms > 10 employees	
	Formal	Informal	Formal	Informal
<b>Post-reform</b>	4.2154 (0.1254)	2.8678 (0.1175)	5.3992 (0.0542)	2.7353 (0.0863)
<b>Pre-reform</b>	4.2092 (0.1804)	2.9897 (0.1444)	5.7947 (0.0736)	2.6027 (0.1156)
<b>Differences</b>	0.0063 (0.2197)	-0.1219 (0.1862)	-0.3955* (0.0914)	0.1326 (0.1442)
<b>Diff's-in-diff's</b>	0.1281 (0.2864)		-0.5281* (0.2134)	

**Table 10: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Unemployment Duration**

	<b>Formal</b>	<b>Informal</b>
<b>Post-reform</b>	7.5985 (0.1187)	9.7731 (0.1489)
<b>Pre-reform</b>	7.3328 (0.1489)	8.7297 (0.1630)
<b>Differences</b>	0.2657 <sup>†</sup> (0.1904)	1.0434* (0.2208)
<b>Differences-in-Differences</b>	- 0.7777* (0.2929)	

**Table 11: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Unemployment Duration, by Gender**

	<b>Men</b>		<b>Women</b>	
	<b>Formal</b>	<b>Informal</b>	<b>Formal</b>	<b>Informal</b>
<b>Post-reform</b>	6.6402 (0.1284)	7.3753 (0.1420)	9.3743 (0.2394)	14.7665 (0.3413)
<b>Pre-reform</b>	6.3455 (0.1536)	6.9092 (0.1569)	9.4983 (0.3321)	12.8988 (0.3894)
<b>Differences</b>	0.2947** (0.2002)	0.4660* (0.2116)	-0.1240 (0.4094)	1.8678* (0.5178)
<b>Differences-in-Differences</b>	-0.1713 (0.2925)		-1.9918* (0.6592)	

**Table 12: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Unemployment Duration, by Age Group**

	Age < 24 years		24- 55 years		Age > 55 years	
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	5.0951 (0.1924)	5.7650 (0.1940)	7.6482 (0.1328)	10.0925 (0.1813)	11.7779 (0.6590)	14.7266 (0.6043)
<b>Pre-reform</b>	5.3906 (0.2454)	5.2083 (0.1823)	7.5569 (0.1729)	9.2324 (0.2077)	9.0156 (0.7171)	12.8679 (0.6642)
<b>Differences</b>	-0.2956 (0.3118)	0.5567* (0.2662)	0.0914 (0.2180)	0.8601* (0.2757)	2.7623* (0.9739)	1.8587** (0.8979)
<b>Diff's-in-diff's</b>	-0.8523**	(0.4184)	-0.7688*	(0.3481)	0.9037	(0.1396)

**Table 13: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Unemployment Duration, by Education Group**

	Primary Education		Secondary Education		High School	
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	8.8191 (0.2843)	9.4874 (0.2115)	7.8214 (0.2306)	9.6863 (0.2738)	7.5593 (0.2248)	10.8365 (0.4081)
<b>Pre-reform</b>	7.4296 (0.2739)	8.4493 (0.2166)	8.1881 (0.2948)	8.5266 (0.2956)	7.4414 (0.3164)	11.1706 (0.5824)
<b>Differences</b>	1.3894* (0.3948)	1.0381* (0.3027)	-0.3666 (0.3742)	1.1597** (0.4029)	0.1179 (0.3881)	-0.3341 (0.7111)
<b>Diff's-in-diff's</b>	0.3513	(0.5224)	-0.5263* (0.5560)		0.4520	(0.7431)

	University Education		University Degree or more	
	<b>Post-reform</b>	6.7676 (0.3448)	10.9950 (0.8242)	6.0907 (0.2727)
<b>Pre-reform</b>	6.9614 (0.4944)	8.3146 (0.8936)	5.3086 (0.3918)	7.8942 (0.9386)
<b>Differences</b>	-0.1938 (0.6027)	2.6804* (1.2157)	0.7822** (0.4773)	1.0441 (1.1648)
<b>Diff's-in-diff's</b>	-2.8742* (1.2379)		-0.2619 (1.1239)	

**Table 14: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Unemployment Duration, by Industry**

	Agriculture		Mining		Manufacturing	
	Formal	Informal	Formal	Informal	Formal	Informal
<b>Post-reform</b>	6.5332 (0.9948)	6.5428 (0.8265)	6.0294 (1.1816)	6.2292 (2.2612)	7.2766 (0.2177)	10.2512 (0.3665)
<b>Pre-reform</b>	7.812 (1.3781)	6.3489 (0.8538)	5.9455 (1.1462)	6.5606 (2.0028)	7.4136 (0.2703)	9.9015 (0.4279)
<b>Differences</b>	-1.2788 (1.6995)	0.1939 (1.1883)	0.0839 (1.6462)	-0.3314 (3.0207)	-0.1370 (0.3471)	0.3496 (0.5634)
<b>Diff's-in-diff's</b>	-1.4728	(2.0497)	0.4153	(3.2289)	-0.4866	(0.6275)
	Utilities		Construction		Commerce	
<b>Post-reform</b>	9.8 (1.1168)	6.5 (1.6065)	5.8669 (0.4841)	5.3911 (0.2734)	7.4709 (0.2522)	11.59 (0.2940)
<b>Pre-reform</b>	6.4314 (0.8747)	3 (1.5)	5.4792 (0.5700)	4.8239 (0.2947)	7.4513 (0.3427)	10.3010 (0.3118)
<b>Differences</b>	3.3686* (1.4186)	3.5 <sup>†</sup> (2.1979)	0.3878 (0.7478)	0.5671 <sup>†</sup> (0.4019)	0.0197 (0.4254)	1.2943 (0.4286)
<b>Diff's-in-diff's</b>	-0.1314	(6.2663)	-0.1794	(0.7816)	-1.2746**	(0.6425)
	Transportation		Financial Services		Services	
<b>Post-reform</b>	6.3961 (0.3678)	6.9820 (0.3759)	6.9234 (0.3546)	9.6664 (0.7508)	8.8563 (0.2602)	10.1112 (0.3019)
<b>Pre-reform</b>	6.6343 (0.5120)	6.4011 (0.4580)	6.6883 (0.4317)	10.1782 (1.0164)	8.0041 (0.3233)	7.9464 (0.2956)
<b>Differences</b>	-0.2381 (0.6304)	0.5809 (0.5925)	0.2351 (0.5586)	0.5119 (1.2636)	0.8522** (0.4150)	2.1648* (0.4226)
<b>Diff's-in-diff's</b>	-0.8190	(0.8679)	-0.7470	(1.1993)	-1.3126*	(0.5924)

**Table 15: Sample Differences-in-Differences Estimates of the Effect of the Reform on Average Unemployment Duration, by Firm Size**

	Self-employed		Firms 2-5 employees	
	Formal	Informal	Formal	Informal
<b>Post-reform</b>	9.8851 (0.5317)	12.0358 (0.2641)	8.3693 (0.3914)	8.7661 (0.2359)
<b>Pre-reform</b>	8.4208 (0.8966)	10.3226 (0.2876)	7.2331 (0.4802)	8.2628 (0.2618)
<b>Differences</b>	1.4642 <sup>†</sup> (1.0424)	1.7132 <sup>*</sup> (0.3905)	1.1361 <sup>**</sup> (0.6195)	0.5033 <sup>†</sup> (0.3524)
<b>Diff's-in-diff's</b>	-0.2490	(1.0863)	0.6328	(0.7099)
	Firms 5-10 employees		Firms > 10 employees	
	Formal	Informal	Formal	Informal
<b>Post-reform</b>	6.7852 (0.3668)	6.6247 (0.3684)	7.3144 (0.1333)	7.3804 (0.2880)
<b>Pre-reform</b>	6.6018 (0.4255)	5.6375 (0.3359)	7.3701 (0.1687)	7.1446 (0.3545)
<b>Differences</b>	0.1834 (0.5618)	0.9872 (0.4986)	-0.0556 <sup>*</sup> (0.2150)	0.2358 (0.3926)
<b>Diff's-in-diff's</b>	-0.8038	(0.7486)	-0.2913	(0.5205)

**Table 16: Exponential Hazard Model Estimates of Employment Duration ( n = 55,683 )**

<b>Variable</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Formal	- 0.2286 (0.0013)	0.1354 (0.0036)	-0.0853 (0.0027)	-0.2409 (0.0105)
Post90	- 0.1247 (0.0011)	-0.0508 (0.0022)	-0.0483 (0.0019)	0.0688 (0.0080)
Formal × Post90	0.0617 (0.0015)	0.0673 (0.0042)	0.0279 (0.0032)	0.0284 (0.0129)
Permanent	-	-0.3939 (0.0021)	-	-
Formal × Permanent	-	-0.3401 (0.0039)	-	-
Post90 × Permanent	-	0.0268 (0.0026)	-	-
Formal × Post90 × Permanent	-	-0.0062 (0.0045)	-	-
Formal × Post90 × Age 25-55 years	-	-	0.0359 (0.0029)	-
Formal × Post90 × Age > 55 years	-	-	-0.0222 (0.0049)	-
Formal × Post90 × Secondary Educ.	-	-	0.0124 (0.0031)	-
Formal × Post90 × High-School Degr.	-	-	0.0538 (0.0035)	-
Formal × Post90 × University Educ.	-	-	0.0596 (0.0035)	-
Formal × Post90 × University Degr.	-	-	-0.0254 (0.0054)	-
Formal × Post90 × Mining	-	-	-	-0.4799 (0.0281)
Formal × Post90 × Manufacturing	-	-	-	-0.0321 (0.0133)
Formal × Post90 × Utilities	-	-	-	1.9788 (0.0661)
Formal × Post90 × Construction	-	-	-	0.0867 (0.0143)
Formal × Post90 × Commerce	-	-	-	-0.0033 (0.0133)
Formal × Post90 × Transportation	-	-	-	0.1178 (0.0141)
Formal × Post90 × Financial Services	-	-	-	0.1339 (0.0144)
Formal × Post90 × Services	-	-	-	0.0367 (0.0133)
Log-likelihood	-12,256,412	-12,131,391	-12,157,990	-12,240,447

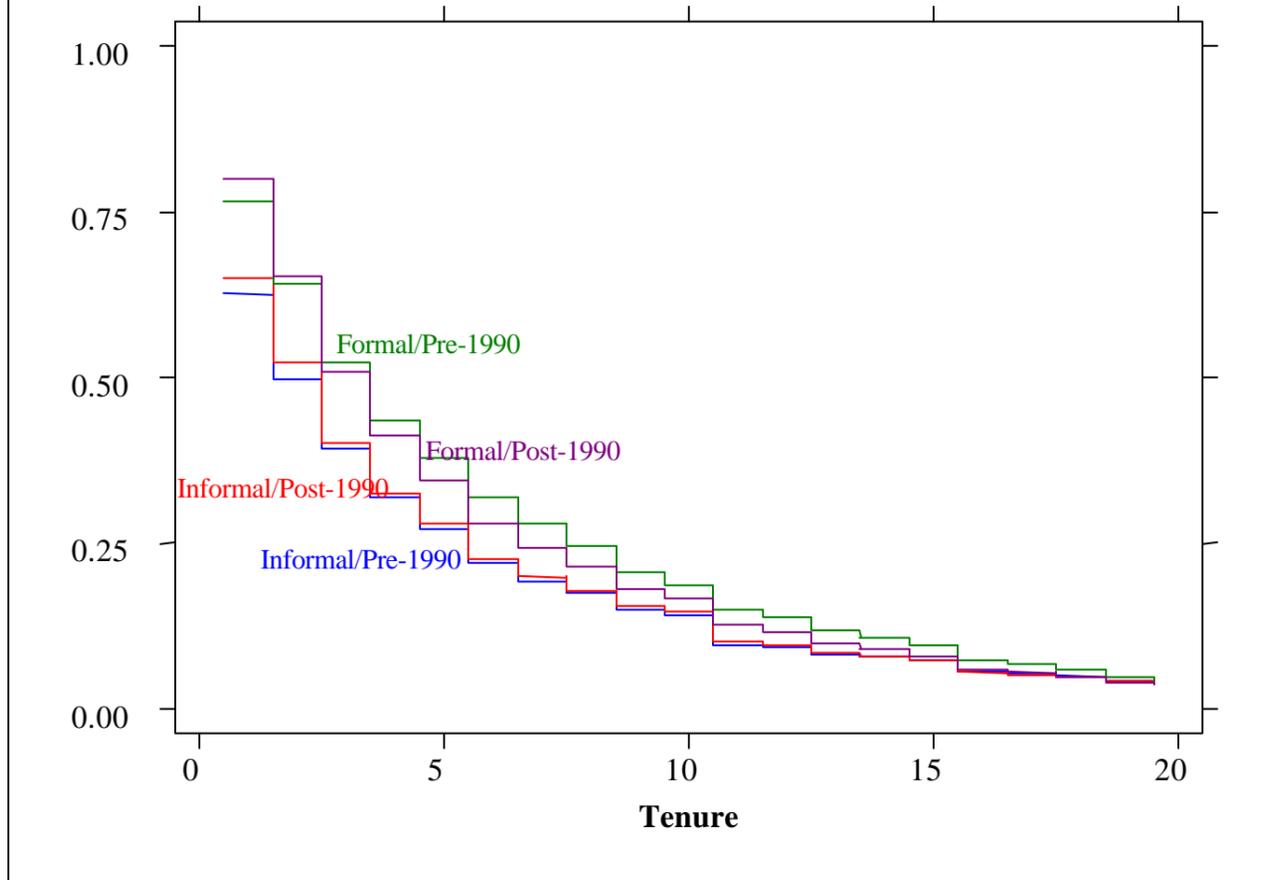
Notes: the table reports changes in the employment hazard estimate with exponential hazard models. The models include: three age dummies, five education dummies, dummies for sex and marital status, number of dependents, nine industry dummies, and six city dummies. Asymptotic standard errors are in parenthesis.

**Table 17: Exponential hazard models of unemployment duration ( n = 55,683 )**

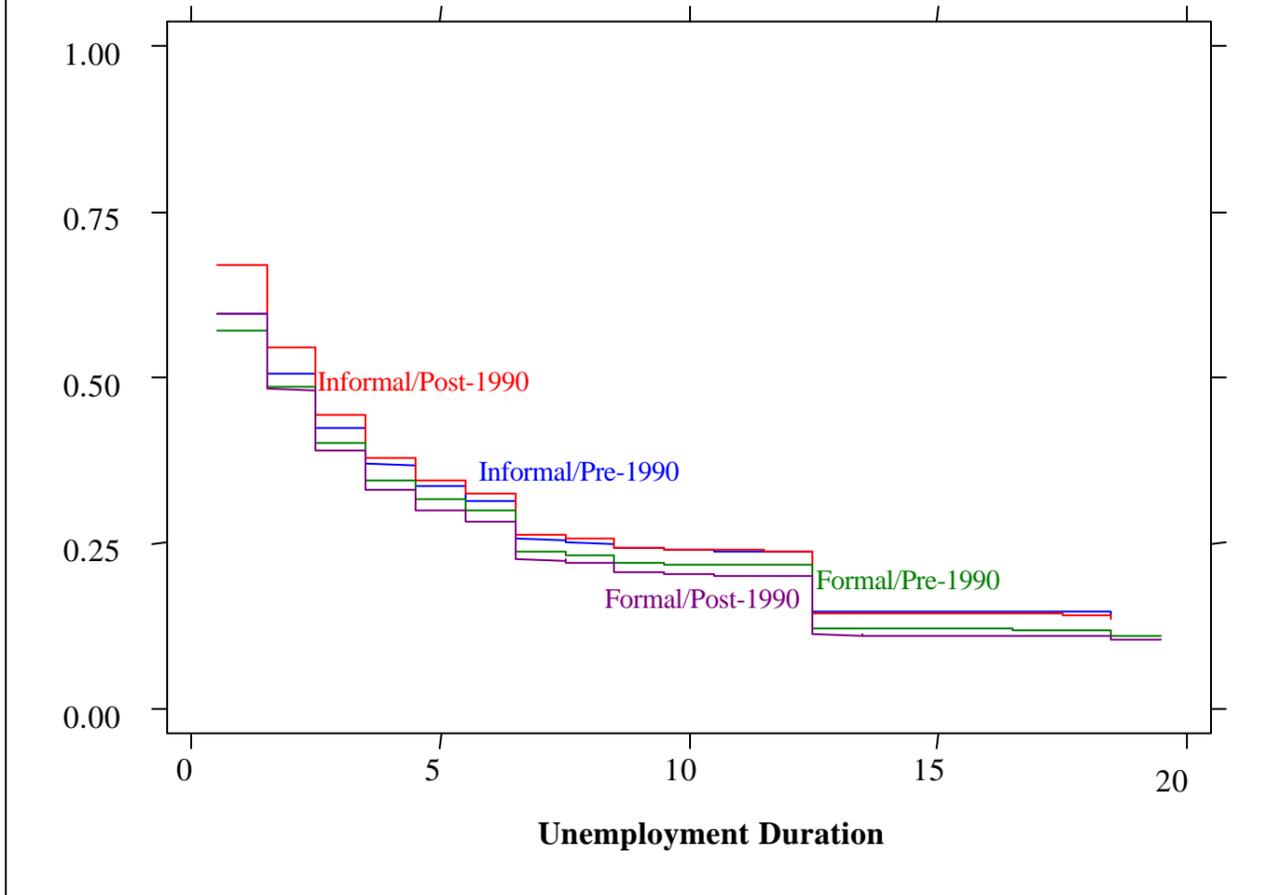
<b>Variable</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Formal	0.0575 (0.0016)	-0.0070 (0.0036)	-0.1752 (0.0036)	-0.3308 (0.0107)
Post90	- 0.0450 (0.0011)	-0.0255 (0.0023)	-0.1202 (0.0028)	0.0563 (0.0081)
Formal × Post90	0.0575 (0.0016)	0.0400 (0.0042)	0.0827 (0.0045)	0.3271 (0.0131)
Permanent	-	0.2676 (0.0022)	-	-
Formal × Permanent	-	0.1335 (0.0039)	-	-
Post90 × Permanent	-	-0.0092 (0.0026)	-	-
Formal × Post90 × Permanent	-	0.0208 (0.0046)	-	-
Formal × Post90 × Age 25-55 years	-	-	-0.1908 (0.0041)	-
Formal × Post90 × Age > 55 years	-	-	-0.3479 (0.0066)	-
Formal × Post90 × Secondary Educ.	-	-	0.1468 (0.0041)	-
Formal × Post90 × High School Degr.	-	-	0.1195 (0.0047)	-
Formal × Post90 × University Educ.	-	-	0.4229 (0.0072)	-
Formal × Post90 × University Degr.	-	-	0.2184 (0.0066)	-
Formal × Post90 × Mining	-	-	-	0.0493 (0.0282)
Formal × Post90 × Manufacturing	-	-	-	-0.2995 (0.0135)
Formal × Post90 × Utilities	-	-	-	-0.0830 (0.0661)
Formal × Post90 × Construction	-	-	-	-0.3426 (0.0145)
Formal × Post90 × Commerce	-	-	-	-0.2617 (0.0134)
Formal × Post90 × Transportation	-	-	-	-0.2872 (0.0142)
Formal × Post90 × Financial Services	-	-	-	-0.3947 (0.0146)
Formal × Post90 × Services	-	-	-	-0.2237 (0.0134)
Log-likelihood	- 17,671,211	-17,613,645	-17,639,878	-17,643,799

Notes: the table reports changes in the unemployment hazard estimated with exponential hazard models. The models include: three age dummies, five education dummies, dummies for sex and marital status, number of dependents, nine industry dummies, and six city dummies. Asymptotic standard errors are in parenthesis.

**Figure 1: Kaplan-Meier Employment Survival Estimates,  
by Period and Coverage**



**Figure 2: Kaplan-Meier Unemployment Survival Estimates,  
by Period and Coverage**



## The Effects of Hiring and Firing Regulation on Unemployment and Employment: Evidence Based on Survey Data

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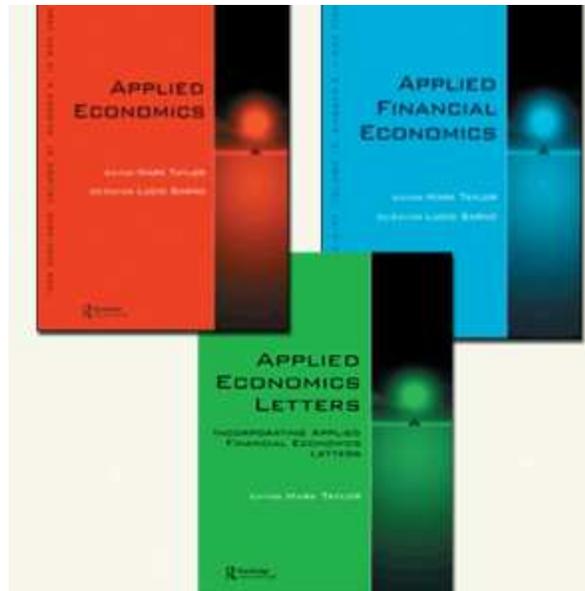
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## The Effects of Hiring and Firing Regulation on Unemployment and Employment: Evidence Based on Survey Data

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# The Effects of Hiring and Firing Regulation on Unemployment and Employment: Evidence Based on Survey Data

**Abstract.** We use the results of surveys among senior business executives to measure the strictness of hiring and firing regulations. The survey data are more likely than objective indicators (used in almost all previous studies) to correctly capture the de facto strictness of these regulations and their relevance to the performance of the labor market. Using data from 19 industrial countries for the period 1992 to 2002, we find that more flexible regulations are likely to lower unemployment and to increase employment rates. While the effects on the general population appear to be modest, the effects on female, young and low-skilled workers seem to be substantial.

**JEL classification:** E24, J23, J63, J64, J68

**Keywords:** employment, employment protection, hiring and firing regulation, unemployment

## 1. Introduction

As is well known, the net effects of hiring and firing regulation on unemployment and employment cannot be unambiguously deduced from theory (see, e.g., Bertola 1990). Given the ambiguity of theoretical models, the direction and magnitude of the impact of hiring and firing regulations have to be resolved empirically. Although many empirical studies have analyzed their effects over the

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3 past years, the evidence so far is mixed.<sup>1</sup> In recent surveys of the empirical literature, the OECD  
4 (2004a, p. 80), Layard et al. (2005, p. XVII) and Bassanini and Duval (2006, p. 89) conclude that  
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6 these studies do not settle the matter.  
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12 This paper attempts to gain new insights by using a subjective indicator of the strictness of hiring  
13 and firing regulation. By contrast, almost all previous studies have used so-called objective  
14 indicators. These indicators have their limitations though. Hiring and firing regulations comprise a  
15 large number of statute laws, administrative orders and court decisions. It is very hard to develop an  
16 objective indicator that correctly reflects the strictness of all of these rules and regulations. Even if  
17 it would be possible to correctly measure the de jure strictness of hiring and firing regulations,  
18 objective indicators are unable to capture the de facto strictness of these regulations, which also  
19 depends on informal norms and the way the formal rules are enforced. The de facto strictness may  
20 vary through time, for example because of changes in the manner how courts and public  
21 administrations apply a given set of laws and regulations. Furthermore, objective indicators are  
22 unable to measure how employers judge the strictness of a given set of hiring and firing regulations.  
23 Employers' judgments, and their responses in terms of recruitment and dismissal of workers, may  
24 also vary through time, even with de jure strictness remaining unchanged. For example, suppose  
25 hiring and firing regulations have recently been liberalized in other economies, or other economies  
26 with more flexible regulations have recently become more open to trade and foreign direct  
27 investment. As a result, employers may conclude that domestic hiring and firing regulations have  
28 become relatively more burdensome. This may induce them to move jobs abroad, lowering  
29 employment and increasing unemployment in the domestic economy.  
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58 <sup>1</sup> See, e.g., Lazear (1990), Addison and Grosso (1996), Scarpetta (1996), Elmeskov et al. (1998), International Monetary  
59 Fund (2003), Heckman and Pagés (2004), OECD (2004a), Baker et al. (2005), Nickell et al. (2005), Bassanini and  
60 Duval (2006).

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3 To capture these aspects and thus to shed new light on the unemployment and employment effects  
4 of hiring and firing regulations, this paper uses the results of surveys in which high-level managers  
5 characterized the strictness of the hiring and firing regulations of their respective economies.  
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7 Section 2 describes the data set and the empirical strategy, particularly discussing the strengths and  
8 weaknesses of the survey data. Section 3 presents and interprets the regression results. Section 4  
9 concludes.  
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## 22 **2. Data**

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27 To measure the strictness of hiring and firing regulation, this paper uses results from the World  
28 Economic Forum's Executive Opinion Surveys (EOS), which are carried out annually in a large  
29 number of countries to determine the international competitiveness of the relevant economies. The  
30 respondents are a company's CEO or a member of its senior management. In each country  
31 approximately 60 to 70 executives are interviewed. The industry structure of the companies  
32 questioned corresponds largely to the industry structure of the relevant economy (excluding the  
33 agricultural sector). Also, care is taken to question companies of various size categories and types  
34 (e.g., private and state-owned, domestically oriented and internationally active enterprises).<sup>2</sup>  
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52 <sup>2</sup> Over time, there have been some changes to the World Economic Forum's surveys that are of minor importance to our  
53 analysis. First, between 1989 and 1995 the surveys were conducted in collaboration with the Institute for Management  
54 Development, Lausanne, and between 1996 and 2001 in collaboration with the Center for International Development at  
55 Harvard University. Second, the number of countries covered has increased steadily from 36 in 1992 to 80 in 2002.  
56 (Due to a lack of data on some of our control variables, our empirical study covers only 19 industrial countries. See text  
57 and Appendix A for details.)  
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3 The typical EOS question asks participants to indicate on a numerical scale which of the two  
4 statements specified in each case they favor. After the questioning, arithmetic means for each  
5 question are calculated from the answers for each country. The Box contains the questions on hiring  
6 and firing regulation used in the following analysis. The World Economic Forum used different  
7 scales in the years before 1997. For the purpose of our analysis, we converted all pre-1997 answers  
8 to the 1-to-7 scale used in the more recent surveys. The period covered by our empirical analysis is  
9 1992 to 2002. In the years prior to 1992, the respective questions were phrased very differently. For  
10 example, in 1991 the EOS statement read: “Flexibility of management to adjust employment levels  
11 during difficult periods: 0 = low, 100 = high” (World Economic Forum and Institute for  
12 Management Development 1991). Thus the question did not explicitly refer to hiring and firing  
13 regulations. In 1990 the EOS statement read: “Flexibility of enterprises to adjust employment and  
14 compensation levels to economic realities: 0 = not at all, to 100 = a great deal” (World Economic  
15 Forum and Institute for Management Development 1990). Similarly, in the years 1984 to 1987 and  
16 in 1989 (there was no survey in 1988), the EOS statement read: “Flexibility of enterprises to adjust  
17 job security and compensation standards to economic realities: 0 = none at all, to 100 = a great  
18 deal” (EMF Foundation – The World Economic Forum 1984, 1985, 1986; World Economic Forum  
19 1987; World Economic Forum and Institute for Management Development 1989). Thus before  
20 1991, the questions did not exclusively refer to adjustments in employment or job security (and thus  
21 at least implicitly to hiring and firing regulations) but also to wage adjustments. Because of these  
22 substantial differences, we excluded the answers to the pre-1992 questions from our data set. The  
23 questions from the Executive Opinion Surveys 1992 to 2002 explicitly refer to hiring and firing  
24 regulations and are all phrased in a similar way (see Box). There are some slight variations but these  
25 are only refinements of style to make the questions more precise. Thus the answers to all 11  
26 questions can be used simultaneously.<sup>3</sup>

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<sup>3</sup> As higher marks on the EOS scale indicate more flexible regulation, we label our variable of interest ‘flexible hiring and firing regulation’.

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There are a number of reasons to assume that the answers of the Executive Opinion Surveys correctly reflect the strictness of hiring and firing regulations and thus may be superior to objective indicators:

- First, the selection of respondents is largely representative and the respondents have comprehensive knowledge of and practical experience with the hiring and firing regulations of their countries.
- Second, the questions are phrased objectively and, at the same time, permit a better coverage of the various facets of hiring and firing regulations than hard data. For example, a country's dismissal regulations comprise a large number of legal standards, administrative orders and court decisions. If only the duration of the statutory notice period and the amount of the severance payment for a worker with ten years' length of service are used as indicators, as was the case with Lazear (1990), the degree of strictness of hiring and firing regulations is not completely and correctly measured. The OECD's (1999, 2004a) employment protection legislation (EPL) indicator, which has been used in almost all recent studies, is much more sophisticated than Lazear's (1990) indicator. Still, although the OECD's EPL indicator does an excellent job in measuring the de jure strictness of hiring and firing regulations, it is unable to capture their de facto strictness. As already pointed out, the de facto strictness also depends on the degree of enforcement of the law and on informal norms. For instance, in some countries, like France, advance notice before dismissal given orally is more important than the length of the notice period stated in the law. Informal norms and the degree of enforcement of the law cannot be captured at all by hard data. By contrast, the answers to the EOS questions appear to be well suited to capture the de facto strictness of hiring and firing regulations.
- Third, as the respondents decide on the recruitment and dismissal of workers, their answers are likely to reflect the relevance of the strictness of hiring and firing regulations to the performance of the labor market. In fact, the answers are likely to reflect this relevance better than objective

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3 data. For instance, when deciding on whether to hire additional workers on a fixed-term basis,  
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5 the decisive aspect is neither the allowed maximum number of successive fixed-term contracts  
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7 nor their allowed maximum cumulated duration, as stated by the law (aspects measured by the  
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9 OECD's EPL indicator). What is decisive is whether the regulations on fixed-term contracts are  
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11 flexible enough in the opinion of those who decide on recruitment and dismissal. As pointed out  
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13 in section 1, employer's opinions are not only determined by domestic rules, formal and  
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15 informal, and the manner the rules are implemented in practice. They are also influenced by  
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17 (changes to) the international competitiveness of these rules. For example, if other economies  
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19 have recently relaxed their hiring and firing regulations, employers may conclude that the  
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21 domestic regulations have become relatively more burdensome, even if these regulations have  
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23 not changed. They may thus relocate jobs abroad, leading to lower employment and higher  
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25 unemployment in the domestic economy. Indeed, empirical studies have found that countries  
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27 with more flexible hiring and firing regulations are able to attract more foreign direct investment  
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29 (Cooke 1997, Görg 2005).  
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39 Of course, potential drawbacks also have to be considered in connection with the use of the  
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41 Executive Opinion Surveys. One potential drawback is that the answers may be distorted by the  
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43 state of the business cycle prevailing at the time of the questioning. For example, the managers of a  
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45 country might judge the dismissal protection regulations favorably during a boom when they do not  
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47 have to lay off many workers. In a subsequent recession, when they do have to substantially reduce  
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49 staff, they might feel restricted by those regulations. Thus, they might then judge them less  
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51 favorably, although the regulations have not been altered in the meantime. However, a closer look  
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53 at the data suggests that the business cycle does not affect the EOS scores. A first indication is that  
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55 the correlation coefficient between the variable output gap and the EOS-based variable hiring and  
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57 firing regulation, at  $-0.21$ , is low and negative, not positive as could be expected if the EOS scores  
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59 would be affected by the business cycle in the way described previously. Furthermore, Table 1  
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3 presents four different regressions with the output gap as an independent variable and flexible  
4 hiring and firing regulation as the dependent variable. Regressions (1) and (2) use the fixed effects  
5 method to control for unobserved country effects. In regression (1), the coefficient on output gap is  
6 statistically significant at the 1% level, but it is negative as well. If we add log income per capita to  
7 control for the impact of the level of economic development, the coefficient on output gap becomes  
8 statistically insignificant [regression (2)]. It remains statistically insignificant if we apply the  
9 random effects instead of the fixed effects method [regression (3)].<sup>4</sup> If we do not control for  
10 unobserved country effects but just for the level of economic development, the coefficient on output  
11 gap is statistically significant at the 1% level [regression (4)]. However, once again, it has a  
12 negative algebraic sign, contradicting the hypothesis that booms (recessions) lead to higher (lower)  
13 EOS scores. All in all, we can safely reject this hypothesis.  
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32 A second potential drawback of the EOS data is that each respondent could use his own yardstick  
33 when answering the questions. For example, on the 1-to-7 scale, an item marked 7 by one person  
34 may only be marked 5 by another. This is a concern particularly because only 60 to 70 managers  
35 were interviewed in each country. However, in the planning, implementation and analysis of the  
36 surveys, care was taken to ensure the use of a uniform yardstick. For one, the respondents were  
37 provided with a written explanation of the answering scale. Also, the answers were examined for  
38 robustness and consistency using various methods. In one of these checks, half of the responses in  
39 each country were randomly dropped from the sample. As the national EOS scores remained stable  
40 in the process, they have obviously not been distorted by individual peculiarities in responding  
41 (Cornelius and Warner 2000, p. 94; Cornelius and McArthur 2002, pp. 169-173; Blanke et al. 2003,  
42 pp. 372-375).  
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<sup>4</sup> The Hausman test indicates that the random effects estimates may be biased (Table 1).

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3 Another concern is that there may be a systematic bias among respondents at the national level. For  
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5 example, respondents in a country might have a similar biased assessment of the strictness of hiring  
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7 and firing regulation if this topic has recently been discussed extensively and with a certain flavor  
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9 in the press. Also, the questions may be interpreted differently in different countries. For these  
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11 reasons, the survey results may not accurately reflect differences in national hiring and firing  
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13 regulation. The authors of the Executive Opinion Surveys tried to avoid this problem by providing  
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15 all respondents with a written explanation of the answering scale and by asking them to think in  
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17 world terms rather than in national terms.  
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24 In order to check whether a “perception bias” exists, we compare the national EOS scores with  
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26 related hard data. As an objective indicator, we use the OECD’s (2004a) employment protection  
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28 legislation (EPL) indicator. This indicator measures the strictness of protection against individual  
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30 dismissals for workers with regular contracts and the strictness of regulation of temporary  
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32 employment (fixed-term contracts, temporary work agency employment).<sup>5</sup> As mentioned  
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34 previously, it solely uses objective data. For example, to measure the strictness of protection against  
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36 individual dismissal, it takes into account, inter alia, the length of the notice period and the amount  
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38 of severance pay at different lengths of tenure. To measure the strictness of regulation of temporary  
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40 employment, it takes into account, inter alia, the maximum number and the maximum cumulated  
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42 duration of successive fixed-term contracts as well as the maximum cumulated duration of  
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44 temporary work agency contracts. The OECD converted these measures into cardinal scores that  
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46 were normalized to range from 0 to 6, with higher scores representing stricter regulation. In  
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55 <sup>5</sup> A second version of the EPL indicator additionally includes specific requirements for collective dismissals. However,  
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57 data for this broader indicator are only available since the late 1990s. This does not pose a major problem, though, as  
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59 specific requirements for collective dismissals do not play a major role. Indeed, as the OECD (2004a, p. 72) has  
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demonstrated, taking account of these specific requirements in the overall measure of EPL strictness does not affect  
cross-country comparisons much.

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3 calculating the summary indicator of EPL strictness, it assigned the same weight to the regulation  
4 covering regular and temporary contracts.  
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10 As hiring and firing regulations are usually reformed only rarely, most of the variation results from  
11 differences across countries rather than from changes through time. Thus we first calculate country  
12 averages for the EPL indicator and the EOS scores. Figure 1 plots the EPL indicator on the  
13 horizontal axis and the survey results on the vertical axis. The graph shows a strong relationship  
14 between the two variables. Indeed, the correlation coefficient for these country averages is  $-0.84$ .  
15 For example, the United States and the United Kingdom had both the lowest EPL scores and some  
16 of the highest EOS scores on average between 1992 and 2002. At the other end of the spectrum are  
17 Italy and Portugal, for example. On average between 1992 and 2002, these countries had both very  
18 high EPL scores and some of the lowest EOS scores. Thus in countries with strict (flexible) hiring  
19 and firing regulations, as measured by the EPL indicator, few (many) respondents thought that  
20 hiring and firing practices were flexibly determined by employers.  
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39 Figure 2 presents the corresponding correlation for the annual data. Unsurprisingly, the overall fit is  
40 somewhat weaker than for the country averages. Still, Figure 2 also indicates that higher (lower)  
41 levels of employment protection strictness, as measured by the OECD's indicator, are strongly  
42 associated with lower (higher) EOS scores. The correlation coefficient for the panel data is  $-0.68$ .  
43 Furthermore, Figure 2 illustrates that changes in hiring and firing regulation that have occurred in  
44 some countries during our period of investigation are reflected not only in the EPL scores but in the  
45 EOS scores as well. For example, in 1994 Spain relaxed procedural requirements for dismissals for  
46 economic reasons, shortened notice periods, permitted temporary work agencies and tightened rules  
47 governing renewals of fixed-term contracts. As a result, not only did its EPL score drop from 3.8 in  
48 1993 to 3.1 in 1994, in addition Spain's EOS score increased from 2.32 in 1993 to 2.56 in 1994. In  
49 1995, its EOS score increased further to 2.76, which is plausible because the Executive Opinion  
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3 Surveys are always conducted in the early months of each year. Obviously, in the early months of  
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5 1995 the scope of the reform was more clearly visible than in the early months of 1994.  
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10 Belgium is a similar case in point. In 1997 it reduced restrictions on temporary work agencies and  
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12 made fixed-term contracts renewable. As a result, Belgium's EPL score fell from 3.2 in 1996 to 2.2  
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14 in 1997. Concurrently, its EOS score increased from 2.63 in 1996 to 3.00 in 1997 and 3.26 in 1998.  
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16 The case of New Zealand also illustrates that substantial changes in the strictness of hiring and  
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18 firing regulations are reflected in changes in EOS scores. Until 1999, New Zealand's hiring and  
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20 firing regulations were relatively flexible. In 2000, the employment relations act tightened  
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22 legislation on dismissals, fixed-term contracts and temporary work agencies. This reform is not only  
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24 reflected in an increase in New Zealand's EPL score from 0.9 in 1999 to 1.5 in 2000 but also in a  
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26 drop of its EOS score from 4.46 in 1999 to 3.00 in 2000 and 2.80 in 2001. The examples of these  
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28 three countries illustrate that significant changes in the strictness of hiring and firing regulations are  
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30 reflected in corresponding changes in EOS scores.  
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39 Overall, Figures 1 and 2 indicate a close connection between perceived hiring and firing regulation  
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41 and employment protection legislation, as measured by the OECD's indicator. Thus the subjective  
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43 data from the Executive Opinion Surveys appear to be well suited for analyzing the impact of hiring  
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45 and firing regulations on labor market performance. To be sure, as pointed out previously, they may  
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47 have certain limitations. However, objective measures have shortcomings of their own and, on  
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49 balance, may be less suitable. For instance, they measure only de jure strictness, whereas the EOS  
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51 scores measure de facto strictness, which certainly is more relevant. Thus the judgments of high-  
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53 level business executives, as recorded in the Executive Opinion Surveys, provide an alternative  
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55 characterization that may shed useful new light on the effects of hiring and firing regulations.  
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57 Therefore, this paper complements previous studies of other researchers who have almost  
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59 exclusively used objective measures.  
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6 To measure the performance of the labor market, we use not only the overall rates of unemployment  
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8 and employment but also unemployment and employment rates relating to women, youths and the  
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10 low skilled. Thus we analyze not only whether the strictness of hiring and firing regulation affects  
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12 the general situation on the labor market but also whether it affects three demographic groups that  
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14 usually have above-average unemployment rates.  
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20 We control for the impact of most other labor market institutions that have been considered in the  
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22 recent literature. As previous empirical studies have shown, certain labor market institutions appear  
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24 to have a considerable impact on the performance of the labor market (see footnote 1). By using  
25  
26 adequate controls, we try to make sure as far as possible that the coefficients on flexible hiring and  
27  
28 firing regulation are not biased due to omitted variables. To date, the OECD has undertaken the  
29  
30 most extensive effort to quantify labor market institutions and has developed the best indicators.  
31  
32 Therefore, we use these data, although they are available for only 19 industrial countries (see  
33  
34 Appendix A). The data cover the following labor market institutions (for variables definitions and  
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36 sources, see Appendix B):  
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- 39 – trade union density,
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- 41 – collective bargaining coverage,
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- 43 – wage bargaining at industry level<sup>6</sup>,
- 44
- 45 – wage bargaining coordination,
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- 47 – tax burden on labor ('tax wedge'),
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- 49 – unemployment benefits replacement rates,
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- 51 – expenditure on active labor market policies per unemployed person.
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<sup>6</sup> This variable is meant to test Calmfors and Driffill's (1988) hump hypothesis, according to which unemployment (employment) will be comparatively high (low) if wages are negotiated at the industry level.

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3 We use the output gap to control for the state of the business cycle. Additionally, we use log income  
4 per capita to account for the effects of differences in the level of economic development, e.g., with  
5 respect to the labor force participation of women. In the regressions to explain the youth  
6 employment rate, we also employ the tertiary enrollment rate. This variable is meant to account for  
7 varying academic education frequencies, which are likely to affect youth employment.  
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17 Finally, we control for unobserved country effects by using country-specific fixed effects. The fixed  
18 effects regressions, presented in the upper parts of Tables 2 and 3, are the baselines for our  
19 empirical estimates.<sup>7</sup> To check whether other methodologies yield similar results, the lower parts of  
20 both tables present the coefficients on our variable of interest from FGLS regressions with country-  
21 specific random effects and from pooled OLS regressions, respectively. In both cases, the control  
22 variables are the same as the ones used for the fixed effects regressions presented in the upper part  
23 of the tables.<sup>8</sup> We prefer the fixed effects model to the random effects model because in 5 out of 8  
24 regressions, the Hausman test indicates that the random effects estimates may be biased (Tables 2  
25 and 3). We prefer the fixed effects model to the pooled OLS model because, first, the estimates  
26 from the latter model are likely to be biased as well in these five cases, and, second, because the  
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47 <sup>7</sup> While controlling for the effects of most other major labor market institutions, the business cycle, the level of  
48 economic development and unobserved country effects goes a long way to avoid omitted variables bias, endogeneity  
49 still may be a problem for estimation because changes in unemployment and employment rates may lead to changes in  
50 the (perceived) strictness of hiring and firing regulation. Unfortunately, due to a lack of instruments we are unable to  
51 directly address this reverse causality problem. (This is in line with the previous literature, which does not use  
52 instruments either.) However, given the results presented in Table 1, it is unlikely that reverse causality is relevant in  
53 our case. (Unemployment and employment rates are strongly correlated with the output gap.)  
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<sup>8</sup> To save space, the estimates for the controls from the random effects FGLS and the pooled OLS regressions are not presented in Tables 2 and 3.

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3 OLS model does not control for unobserved country effects. Instead, it treats successive  
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5 observations for each country as independent.<sup>9</sup>  
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### 10 11 12 13 **3. Results** 14 15 16 17

18 Tables 2 and 3 present our multivariate regressions to explain unemployment and employment  
19 rates, respectively. Our results for the control variables largely accord with those obtained in many  
20 earlier studies. For example, in line with most previous studies we find that an increase in the tax  
21 wedge is likely to both raise unemployment and lower the employment level.<sup>10</sup> Furthermore, we  
22 find that generous unemployment benefit schemes appear to increase unemployment. This is also in  
23 line with most recent studies.<sup>11</sup> Additionally, while some of our estimates corroborate Calmfors and  
24 Driffill's (1988) hump hypothesis, overall the evidence in favor of this hypothesis is weak. This,  
25 too, accords with the previous literature (Aidt and Tzannatos 2002).  
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39 We now turn to the results for our variable of interest. Indeed, the key finding of our empirical  
40 investigation is that hiring and firing regulation appears to have a statistically significant and robust  
41 effect on labor market performance. The coefficient on flexible hiring and firing regulation is  
42 statistically significant in all fixed effects regressions, in seven out of eight random effects  
43 regressions and in four out of eight pooled OLS regressions. According to our estimates, more  
44 flexible hiring and firing regulation is associated with lower unemployment among the total labor  
45 force as well as among female, young and low-skilled workers (Table 2). Similarly, it is associated  
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56 <sup>9</sup> We also checked the robustness of our results by dropping the control variables from our baseline specifications one at  
57 a time. In these checks (results not reported here), the coefficient on our variable of interest remained very similar.  
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60 <sup>10</sup> Important studies on the effects of labor taxes include, e.g., Daveri and Tabellini (2000) and Prescott (2004).

<sup>11</sup> See, e.g., Jenkins and Garcia-Serrano (2004), Lalive and Zweimüller (2004) and Nickell et al. (2005).

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2  
3 with a higher level of employment among the overall working-age population as well as among  
4  
5 women, youths and the low-skilled (Table 3).<sup>12</sup>  
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10 Our estimates suggest that liberalizing hiring and firing regulation would have a notable, though  
11 generally modest, pay-off in terms of lower unemployment and higher employment. For example,  
12 according to the Executive Opinion Surveys, France had one of the strictest hiring and firing  
13 regulation in our sample of 19 industrial countries. During the period under review, its EOS score  
14 averaged 2.84. By contrast, Switzerland had one of the most flexible hiring and firing regulation. Its  
15 EOS score averaged 5.31. Switzerland also had substantially lower unemployment rates as well as  
16 substantially higher employment rates, both among the total population and among each of the three  
17 demographic groups. According to our fixed effects estimates, if hiring and firing regulation in  
18 France had been as flexible as in Switzerland, the French unemployment rate would have been 1.1  
19 percentage points lower among the total labor force, 1.6 percentage points lower among women, 2.1  
20 percentage points lower among young people and 1.7 percentage points lower among the low  
21 skilled, *ceteris paribus*. Additionally, France's employment rate would have been 1.1 percentage  
22 points higher both among the total working-age population and among women, 1.5 percentage  
23 points higher among young people and 2.1 percentage points higher among low-skilled workers,  
24 *ceteris paribus*. Of course, these figures should be interpreted with some caution. However, they  
25 illustrate the magnitude of the effects.  
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50 According to our results, flexible hiring and firing regulations are favorable for workers,  
51 particularly for female, young and low-skilled workers. If the regulations relating to fixed-term  
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56 <sup>12</sup> As mentioned in section 1, the evidence from previous empirical studies, which almost exclusively use objective  
57 indicators, so far is mixed. By contrast, our results are less ambiguous. The main reason for this difference may be that  
58 our survey-based indicator is more likely than objective indicators to correctly capture the *de facto* strictness of hiring  
59 and firing regulations and their relevance to the performance of the labor market (see section 2).  
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3 contracts and temporary work agencies are flexible, these workers seem more often to have an  
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5 opportunity to find a job via temporary employment contracts and thus to establish themselves in  
6  
7 working life. If dismissal regulations are not too restrictive, employers seem to be more inclined to  
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9 hire women, young people and low-skilled workers for an indefinite period, as they are in a position  
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11 to rapidly dismiss them if the profitability of their employment proves to be inadequate or if the  
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13 business situation deteriorates. In the end, these workers benefit from this planning scope of  
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15 employers.  
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22 Our results corroborate those theoretical models according to which high costs of hiring and firing  
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24 impair the employment situation. For example, extending Bertola's (1990) well-know model,  
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26 Risager and Sørensen (1997) have shown that an increase in hiring and firing costs *ceteris paribus*  
27  
28 reduces the return on capital, lowering investment, labor demand and employment. As our results  
29  
30 indicate that strict hiring and firing rules are likely to have an especially adverse impact on women,  
31  
32 young people and low-skilled workers, they particularly corroborate Lindbeck and Snower's (1988)  
33  
34 insider-outsider theory, according to which these kind of rules deteriorate the employment  
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36 opportunities of these groups in particular.  
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#### 46 **4. Conclusion**

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51 This paper provides new evidence of the effects of hiring and firing regulations on unemployment  
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53 and employment rates. In contrast to the previous literature, which almost exclusively relies on hard  
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55 data, we use the results of surveys among senior business executives to measure the strictness of  
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57 these kind of regulations. The survey data are more likely than objective indicators to correctly  
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59 capture their *de facto* strictness and their relevance to the performance of the labor market.  
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Controlling for the impact of important labor market institutions, the business cycle, the level of

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3 economic development and unobserved country effects, we find that more flexible hiring and firing  
4 regulations are likely to lower unemployment and to increase the employment level. While the  
5 effects on the general population appear to be modest, the effects on women, young people and low-  
6 skilled workers seem to be substantial.  
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## 12 13 14 15 16 17 **Appendix A. List of countries**

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22 Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan,  
23 Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom,  
24 United States.  
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## 34 **Appendix B. Definitions and sources of variables**

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39 Active labor market policies: Expenditure on active labor market programs per unemployed person,  
40 divided by 1,000. Source: OECD (2004a).  
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44 Collective bargaining coverage: Percentage of salaried workers subject to union-negotiated terms  
45 and conditions of employment. Source: OECD (2004a).  
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48  
49 Employment protection legislation: Indicator for strictness of protection against individual  
50 dismissals and for strictness of regulation of temporary employment (fixed-term contracts,  
51 temporary work agency employment). The indicator ranges from 0 to 6, with higher values  
52 representing stricter regulation. Source: OECD (2004a).  
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58 Employment rate: Employed aged 15 to 64 years as a percentage of the population in the same age  
59 bracket. Source: International Labour Office (2003), OECD (2005a, 2005b).  
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3 Employment rate among low-skilled workers: Employed with less than upper secondary education  
4 as a percentage of the population with the same educational attainment. Persons aged 25 to  
5  
6 64 years. Source: OECD (1997, 1998, 1999, 2005a).  
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10 Female employment rate: Employed women aged 15 to 64 years as a percentage of the female  
11 population in the same age bracket. Source: International Labour Office (2003), OECD  
12 (2005a; 2005b).  
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17 Female unemployment rate: Unemployed women aged 15 to 64 years as a percentage of the female  
18 labor force in the same age bracket. Source: International Labour Office (2003), OECD  
19 (2005a).  
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24 Flexible hiring & firing regulation: Survey responses from the World Economic Forum's annual  
25 Executive Opinion Surveys. In each country approximately 60 to 70 senior business  
26 executives were interviewed (see text for a more detailed description of the surveys). The  
27 answer scale ranges from 1 to 7, with higher marks on the scale meaning more flexible  
28 regulation (see Box for phrasing of questions). Source: World Economic Forum (1996,  
29 1997, 1998, 1999, 2000, 2002, 2003), World Economic Forum, Institute for Management  
30 Development (1992, 1993, 1994, 1995).  
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41 Log income per capita: The natural logarithm of gross national income divided by midyear  
42 population, converted into current international dollars using purchasing power parity rates.  
43 Source: World Bank (2005).  
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48 Output gap: Deviations of actual GDP from potential GDP as a per cent of potential GDP. Source:  
49 OECD (2005c).  
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53 Tax wedge: Income tax plus employee's and employer's social security contributions less cash  
54 benefits as a percentage of labor costs; one-earner family with two children; average  
55 production worker. Source: OECD (2004b).  
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3 Tertiary enrollment rate: Students enrolled in tertiary education, regardless of age, as a percentage  
4 of the population of the age group that officially corresponds to this level of education.  
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8 Source: World Bank (2004).  
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10 Trade union density: Percentage of employees in trade unions. Source: OECD (2004a).  
11

12 Unemployment benefits replacement rates: Gross unemployment benefits as a percentage of  
13 previous gross wage earnings. Averages across two earnings levels, three family types, and  
14 three unemployment duration categories. Source: OECD (2004c).  
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19 Unemployment rate: Unemployed as a percentage of the civilian labor force (standardized rates).  
20  
21 Source: OECD (2005c).  
22  
23

24 Unemployment rate among low-skilled workers: Unemployed with less than upper secondary  
25 education as a percentage of the labor force with the same educational attainment. Persons  
26 aged 25 to 64 years. Source: OECD (1997, 1998, 1999, 2005a).  
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31 Wage bargaining at industry level: Industry level predominant in wage bargaining, dummy variable.  
32  
33 Source: OECD (2004a).  
34  
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36 Wage bargaining coordination: Degree of coordination in wage bargaining. The indicator ranges  
37 from 1 to 5, with higher values representing a higher degree of coordination. Source: OECD  
38 (2004a).  
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43 Youth employment rate: Employed aged 15 to 24 years as a percentage of the population in the  
44 same age bracket. Source: OECD (2005a, 2005b).  
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48 Youth unemployment rate: Unemployed aged 15 to 24 years as a percentage of the labor force in  
49 the same age bracket. Source: International Labour Office (2003), OECD (2005a).  
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**Questions on hiring & firing regulation from the Executive Opinion Surveys (EOS)**

- EOS 1992: “Hiring and firing practices are: (0 = too restricted by government, 100 = flexible enough)”
- EOS 1993, 1994 & 1995: “Hiring and firing practices are: (0 = too restricted by government, 10 = flexible enough)”
- EOS 1996: “Hiring and firing practices are flexible enough (1 = strongly disagree; 6 = strongly agree)”
- EOS 1997, 1998 & 1999: “Hiring and firing practices are flexibly determined by employers (1 = strongly disagree; 7 = strongly agree)”
- EOS 2000: “Hiring and firing practices by companies are determined by employers. (1 = strongly disagree; 7 = strongly agree)”
- EOS 2001 & 2002: “Hiring and firing of workers is: (1 = impeded by regulations, 7 = flexibly determined by employers)”

*Source:* World Economic Forum (1996, 1997, 1998, 1999, 2000, 2002, 2003), World Economic Forum and Institute for Management Development (1992, 1993, 1994, 1995).

**Table 1. Correlation between output gap and hiring & firing regulation<sup>a)</sup>**

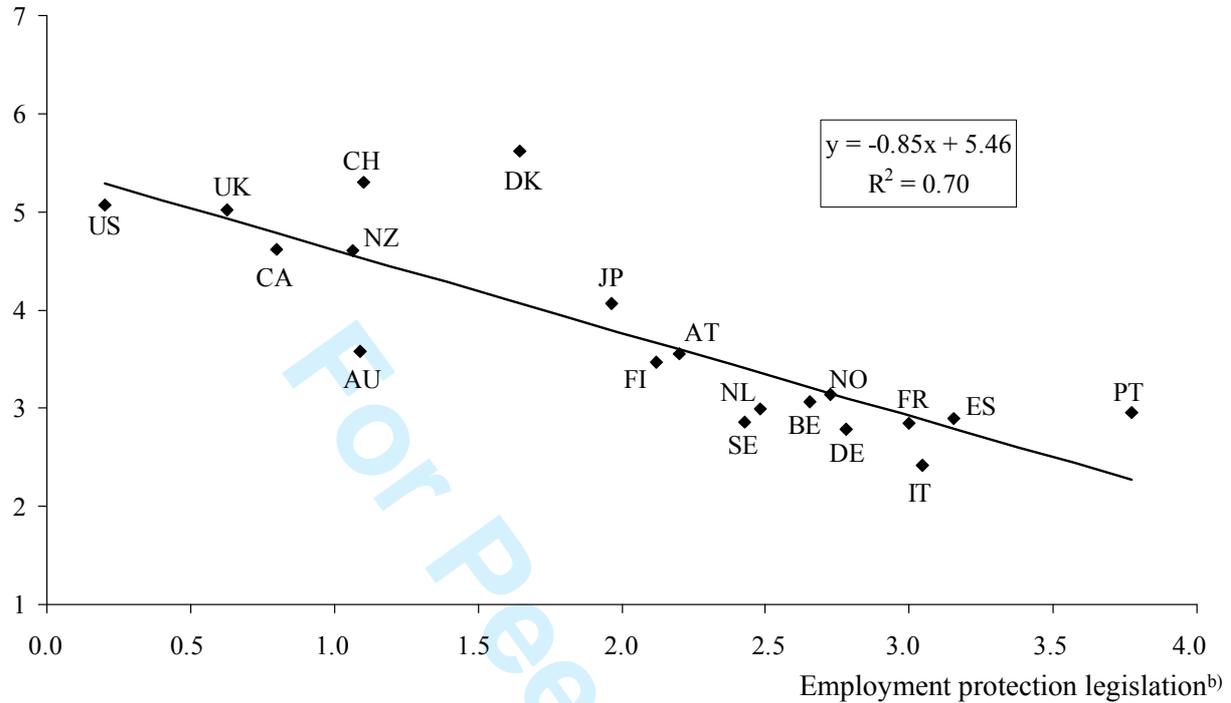
	Dependent variable: Flexible hiring & firing regulation			
	Fixed effects regression	Fixed effects regression	Random effects FGLS regression	Pooled OLS regression
	(1)	(2)	(3)	(4)
Output gap	-0.13*** (-7.74)	0.00 (0.10)	-0.01 (-0.45)	-0.12** (-2.57)
Log income per capita		-3.03*** (-7.89)	-2.74*** (-6.73)	0.61 (0.88)
Country-specific effects	Yes	Yes	Yes <sup>b)</sup>	No
Number of observations	209	209	209	209
Adjusted R <sup>2</sup>	0.78	0.85	0.41	0.05
Standard error of regression	0.53	0.44	0.45	1.11
F-statistic	40.81***	60.24***	72.88***	6.07***
Hausman test			13.05***	

<sup>a)</sup>Data for 19 industrial countries from the years 1992 to 2002. Heteroskedasticity-consistent t-statistics in parentheses (White method), except for the pooled OLS regression, where the figures in parentheses are heteroskedasticity- and autocorrelation-consistent t-statistics (Newey-West method). \*\*\*(\*\*/\*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain a constant term. See Appendix A for a list of countries. See Appendix B for variables descriptions and sources.

<sup>b)</sup>Swamy-Arora method.

## Figure 1. Hard versus survey data on hiring & firing regulation – Country averages<sup>a)</sup>

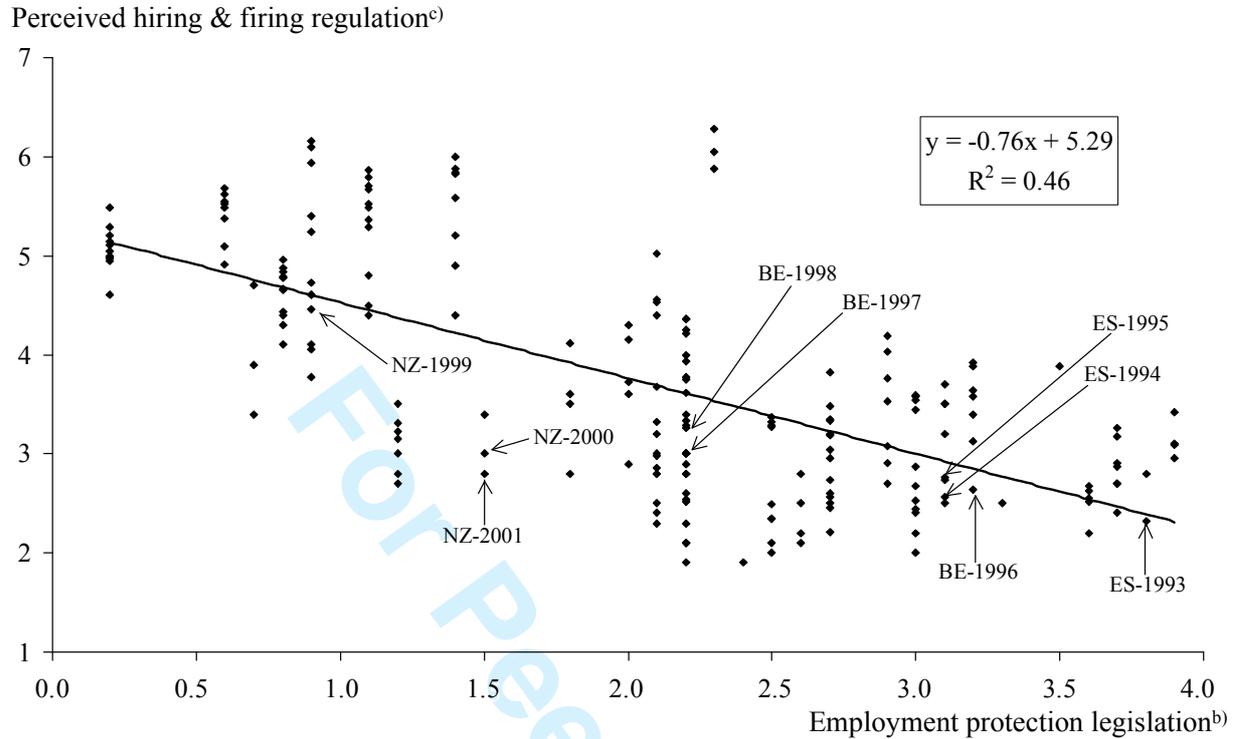
Perceived hiring & firing regulation<sup>c)</sup>



- a) 19 industrial countries; averages over 1992-2002. See Appendix A for a list of countries.
- b) Indicator for strictness of protection against individual dismissals and for strictness of regulation of temporary employment (fixed-term contracts, temporary work agency employment). The indicator ranges from 0 to 6, with higher values representing stricter regulation. It was developed by the OECD.
- c) Answers from the World Economic Forum's Executive Opinion Surveys. The answer scale ranges from 1 to 7, with higher marks on the scale meaning more flexible regulation. See Box for phrasing of questions.

Source: See Appendix B.

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4 **Figure 2. Hard versus survey data on hiring & firing regulation**  
5 **– Panel data<sup>a)</sup>**  
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- 32 a) 19 industrial countries; annual data for the years 1992-2002. See Appendix A for a list of countries.  
33 b) Indicator for strictness of protection against individual dismissals and for strictness of regulation of temporary  
34 employment (fixed-term contracts, temporary work agency employment). The indicator ranges from 0 to 6, with  
35 higher values representing stricter regulation. It was developed by the OECD.  
36 c) Answers from the World Economic Forum's Executive Opinion Surveys. The answer scale ranges from 1 to 7, with  
37 higher marks on the scale meaning more flexible regulation. See Box for phrasing of questions.

38 *Source:* See Appendix B.

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**Table 2. Fixed effects regressions to explain unemployment rates<sup>a)</sup>**

	Unemployment rate	Female unemployment rate	Youth unemployment rate	Unemployment rate among low-skilled workers
	(1)	(2)	(3)	(4)
Flexible hiring & firing regulation	-0.43*** (-2.78)	-0.66** (-2.60)	-0.85** (-2.11)	-0.68* (-1.91)
Trade union density	0.00 (0.01)	0.03 (0.38)	-0.05 (-0.37)	-0.27*** (-4.57)
Collective bargaining coverage	0.03 (1.49)	0.00 (0.06)	-0.02 (-0.43)	0.09*** (2.84)
Wage bargaining at industry level	3.07*** (5.57)	1.43 (1.27)	2.32 (1.46)	9.31*** (9.70)
Wage bargaining coordination	2.10*** (5.18)	1.00 (1.12)	3.33*** (2.84)	2.55*** (5.61)
Tax wedge	0.20*** (5.36)	0.24*** (5.05)	0.38*** (6.39)	0.17** (2.60)
Unemployment benefits replacement rates	0.06*** (4.07)	0.04*** (2.66)	0.06* (1.65)	0.13*** (5.26)
Active labor market policies	-0.12*** (-4.37)	-0.20*** (-8.07)	-0.19*** (-4.82)	-0.10*** (-3.21)
Output gap	-0.42*** (-24.39)	-0.26*** (-7.90)	-0.86*** (-14.67)	-0.53*** (-8.00)
Log income per capita	-4.46*** (-2.72)	-6.31** (-2.29)	-6.36 (-1.43)	-11.91*** (-5.88)
Adjusted R <sup>2</sup>	0.95	0.94	0.94	0.93
Standard error of regression	0.77	1.29	2.01	1.16
F-statistic	140.87***	122.64***	124.06***	78.43***
Memorandum item: Random effects FGLS regressions <sup>b)</sup>				
Coefficient on flexible hiring & firing regulation	-0.25** (-1.98)	-0.56*** (-2.79)	-0.89** (-2.54)	-0.40 (-1.37)
Adjusted R <sup>2</sup>	0.74	0.58	0.58	0.64
Standard error of regression	0.83	1.28	2.03	1.29
F-statistic	61.05***	29.36***	30.18***	31.53***
Hausman test	39.00***	8.20	13.96	48.80***
Memorandum item: Pooled OLS regressions				
Coefficient on flexible hiring & firing regulation	-0.67** (-2.40)	-0.78 (-1.62)	-2.19*** (-3.34)	-0.23 (-0.58)
Adjusted R <sup>2</sup>	0.73	0.62	0.69	0.69
Standard error of regression	1.78	3.29	4.67	2.39
F-statistic	57.66***	35.61***	48.28***	39.09***
Number of observations	208	209	209	170

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**Table 2. Fixed effects regressions to explain unemployment rates<sup>a)</sup>**  
(continued)

<sup>a)</sup>Pooled least squares estimates with country-specific fixed effects. The lower parts of the table present estimates from FGLS regressions with country-specific random effects and from pooled OLS regressions, respectively. In both cases, the control variables are the same as the ones used for the fixed effects regressions presented in the upper part of the table. Data for 19 industrial countries from the years 1992 to 2002. Heteroskedasticity-consistent t-statistics in parentheses (White method), except for the pooled OLS regressions, where the figures in parentheses are heteroskedasticity- and autocorrelation-consistent t-statistics (Newey-West method). \*\*\*(\*\*/\*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain a constant term. See Appendix A for a list of countries. See Appendix B for variables descriptions and sources.

<sup>b)</sup>Swamy-Arora method.

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**Table 3. Fixed effects regressions to explain employment rates<sup>a)</sup>**

	Employment rate	Female employment rate	Youth employment rate	Employment rate among low-skilled workers
	(1)	(2)	(3)	(4)
Flexible hiring & firing regulation	0.45*** (3.28)	0.45*** (3.67)	0.59** (2.32)	0.84*** (4.04)
Trade union density	-0.01 (-0.20)	-0.11 (-1.64)	0.06 (0.58)	0.45*** (5.45)
Collective bargaining coverage	-0.01 (-0.62)	0.00 (0.09)	0.06 (1.27)	-0.15*** (-4.74)
Wage bargaining at industry level	1.47 (1.12)	4.74*** (2.88)	-0.44 (-0.21)	-2.62*** (-3.90)
Wage bargaining coordination	-1.10** (-2.05)	-0.20 (-0.44)	-2.53** (-2.02)	-3.14*** (-3.89)
Tax wedge	-0.19*** (-5.46)	-0.18*** (-4.23)	-0.31*** (-4.04)	-0.16** (-2.43)
Unemployment benefits replacement rates	-0.02 (-1.15)	-0.00 (-0.02)	-0.10*** (-3.76)	0.03 (0.95)
Active labor market policies	0.34*** (7.74)	0.44*** (8.21)	0.61*** (8.05)	0.27*** (6.34)
Output gap	0.27*** (6.59)	0.03 (0.43)	0.82*** (11.37)	0.24*** (4.25)
Log income per capita	8.02*** (5.37)	12.24*** (9.68)	-2.37 (-0.75)	9.28*** (5.42)
Tertiary enrollment rate			-0.01 (-0.95)	
Adjusted R <sup>2</sup>	0.98	0.99	0.98	0.94
Standard error of regression	1.03	1.14	1.95	1.72
F-statistic	359.68***	561.93***	308.30***	103.15***
Memorandum item: Random effects FGLS regressions <sup>b)</sup>				
Coefficient on flexible hiring & firing regulation	0.48*** (3.21)	0.47*** (3.59)	0.98*** (5.48)	0.70*** (3.03)
Adjusted R <sup>2</sup>	0.77	0.80	0.58	0.32
Standard error of regression	1.04	1.17	2.01	1.78
F-statistic	68.92***	84.07***	26.54***	8.93***
Hausman test	14.06	19.55**	22.73**	19.76**
Memorandum item: Pooled OLS regressions				
Coefficient on flexible hiring & firing regulation	1.09** (2.03)	0.47 (0.60)	4.74*** (6.64)	-0.56 (-0.64)
Adjusted R <sup>2</sup>	0.76	0.69	0.78	0.41
Standard error of regression	3.55	5.54	6.09	5.60
F-statistic	66.40***	47.42***	67.28***	12.85***
Number of observations	209	209	207	170

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**Table 3. Fixed effects regressions to explain employment rates<sup>a)</sup>**  
(continued)

<sup>a)</sup>Pooled least squares estimates with country-specific fixed effects. The lower parts of the table present estimates from FGLS regressions with country-specific random effects and from pooled OLS regressions, respectively. In both cases, the control variables are the same as the ones used for the fixed effects regressions presented in the upper part of the table. Data for 19 industrial countries from the years 1992 to 2002. Heteroskedasticity-consistent t-statistics in parentheses (White method), except for the pooled OLS regressions, where the figures in parentheses are heteroskedasticity- and autocorrelation-consistent t-statistics (Newey-West method). \*\*\*(\*\*/\*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain a constant term. See Appendix A for a list of countries. See Appendix B for variables descriptions and sources.

<sup>b)</sup>Swamy-Arora method.

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The Incidence of Mandated Maternity Benefits

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## The Incidence of Mandated Maternity Benefits

By JONATHAN GRUBER\*

*I consider the labor-market effects of mandates which raise the costs of employing a demographically identifiable group. The efficiency of these policies will be largely dependent on the extent to which their costs are shifted to group-specific wages. I study several state and federal mandates which stipulated that childbirth be covered comprehensively in health insurance plans, raising the relative cost of insuring women of childbearing age. I find substantial shifting of the costs of these mandates to the wages of the targeted group. Correspondingly, I find little effect on total labor input for that group. (JEL I18, J32, H51)*

In an era of tight fiscal budget constraints, mandating employer provision of workplace benefits to employees is an attractive means for a government to finance its policy agenda. Consequently, in recent years there has been a growth of interest in mandated benefits as a tool of social policy. For example, the centerpiece of President Bill Clinton's health-care proposal is mandated employer provision of health insurance, and more than 20 states have mandated some form of maternity leave since 1987.

Aside from their political attraction, there may be an efficiency argument for mandates, relative to public expenditure, as a means of financing benefit expansions. As highlighted by Lawrence H. Summers (1989), publicly financed benefits require an increase in government revenue-raising, with the resulting deadweight loss from taxation.

Mandates, however, are financed by a benefits tax; if employees value the benefit that they are receiving, then the deadweight loss from financing that benefit will be lower than from tax financing. In the limit, with full valuation of the benefit by employees, wages will fall to offset the cost of the benefit to the employer, and there will be no efficiency cost. In fact, recent research has suggested that the increased costs of one workplace mandate, workers compensation, were largely shifted to wages with little effect on employment (Jonathan Gruber and Alan B. Krueger, 1991).

This efficiency argument, however, may not apply to a popular type of policy, the "group-specific mandate," which mandates the expansion of benefits for a demographically identifiable group within the workplace.<sup>1</sup> In the case of mandates such as maternity leave, there is likely to be less scope for the free adjustment of wages to

\* Department of Economics, Massachusetts Institute of Technology, Cambridge, MA 02139. I am grateful to Gary Chamberlain, David Cutler, Richard Freeman, Rachel Friedberg, Jerry Hausman, Olivia Mitchell, Rodrigo Vergara, seminar participants at Harvard, MIT, and the NBER, and two anonymous referees for helpful comments; to Josh Angrist, Larry Katz, Jim Poterba, and Larry Summers for both valuable suggestions and guidance; and to the Sloan Foundation and the Harvard Chiles Fellowship for financial support.

<sup>1</sup> Given the prevalence of experience rating in insurance markets, any social insurance mandate may be group-specific, since different individuals may cost the employer different amounts. In this paper, I define group-specific mandates as those which affect a demographically identifiable group only. It is unclear whether the results can be extended to cases in which workers are distinguished along more subtle dimensions.

reflect the valuation of the benefit by the targeted group, since there are barriers to *relative* wage adjustment within the workplace (such as antidiscrimination rules or workplace relative-pay norms) which do not affect the adjustment of overall workplace wage levels. Without the ability of relative wages to adjust, there may be substantial deadweight loss from these mandates even if the benefit is valued by that group. Thus, in considering the efficacy of these mandates, a central consideration is whether the cost of the mandate is shifted to the wages of the group that benefits.

This paper uses a set of “natural experiments” to estimate the response of the labor market to a group-specific mandate: state and federal laws that mandated comprehensive coverage for childbirth in health insurance policies. A commonly accepted feature of health insurance benefits before the mid-1970’s was limited coverage for childbirth. Maternity coverage was sometimes excluded from basic health benefits; if included, it was often subject to flat-rate cash amount limits regardless of the cost of delivery. This differential coverage was widely perceived as discriminatory (Geraldine Leshin, 1981; Alan Guttmacher Institute, 1987). Many states responded to this perception in the 1975–1978 period by passing laws which prohibited treating pregnancy differently from “comparable illnesses” in health insurance benefits. Then, in October 1978, the Federal Government passed the Pregnancy Discrimination Act (PDA), which prohibited any differential treatment of pregnancy in the employment relationship.

This set of laws offers two advantages for studying the labor-market impact of a group-specific mandate. First, they affected a readily identifiable group, women of childbearing age and their husbands (under whose insurance these women may have been covered), so that I am able to study their impact based on observable characteristics. Second, they were fairly costly for these individuals, due both to the widespread existence of differential maternity benefits before 1978 and the large fraction

of health insurance costs for women of childbearing age which are accounted for by maternity benefits.

I use the Current Population Survey (CPS) to study the extent to which the cost of these group-specific mandates was shifted to the targeted group’s wages and the effect on net labor input. I begin by examining changes in wages, hours worked, and employment for married women of childbearing age in states which passed these “maternity mandates,” relative to a set of control individuals within the state and relative to similar states which did not pass this legislation. I then assign each worker an individual-specific cost of the mandate, which is a function of the age-specific cost of maternity coverage, the probability that the worker receives insurance on the job, and the predicted type of insurance coverage that she receives. This allows me to use individual variation in identifying the impact of the mandate and to estimate more precisely the extent of shifting. Finally, I note that, with the passage of the 1978 federal law, the existing state laws provide a natural set of controls; I exploit this “reverse experiment” to confirm my earlier findings. The findings consistently suggest shifting of the costs of the mandates on the order of 100 percent, with little effect on net labor input.

The paper proceeds as follows. Section I presents some background on health insurance benefits for maternity in the 1970’s and discusses the economics of a group-specific mandated benefit. After describing the data and my estimation strategy in Section II, I estimate the impact of the state mandates on the labor-market outcomes of women of childbearing age (and their husbands) in Section III. In Section IV, I study the federal mandate. Section V concludes by discussing the welfare implications of these findings and suggesting directions for future research.

## I. Background

Before 1978, health insurance benefits for maternity were generally limited along two

dimensions: either there was no coverage for pregnancy, or benefits were paid as a flat lump-sum cash amount, regardless of the ultimate costs of childbirth. This stood in contrast to coverage for common illnesses in this era, which was fairly complete.<sup>2</sup> During the 1975–1979 period, 23 states passed laws that outlawed treating pregnancy differently from comparable illnesses. This was also an important feature of the 1978 federal legislation, the PDA, which prohibited discrimination against pregnant women more broadly. The employer cost of the state (and later federal) mandates depends on two factors: the extent of differential coverage before these laws and the cost of its removal.

#### A. *The Extent of Differential Coverage*

There are two previous estimates of the extent of differential coverage for maternity benefits in this era. Dorothy R. Kittner (1978) used a 1976 Labor Department survey of health insurance plans to show that, while over 90 percent of plans included maternity benefits, nearly 60 percent of the plans provided less generous benefits for childbirth than for other disabilities. However, the Health Insurance Association of America (1978) used data from a survey of new group health insurance policies written in early 1978 to estimate that only 52 percent of employees had any coverage for maternity. Both of these estimates are problematic: Kittner's only includes firms with more than 26 employees and does not include information on dependent coverage; the Health Insurance Association of America looks only at new policies, which may have been supplementary to existing policies (and therefore less generous), and does not focus on women of childbearing age.

To obtain more accurate estimates, I use the 1977 National Medical Care Expendi-

<sup>2</sup>This differential coverage may have been a natural response to problems of adverse selection in the timing of pregnancy. Arleen Leibowitz (1990) finds that fertility rates of women with first-dollar coverage were 29-percent higher than those with some coinsurance in the RAND Health Insurance Experiment.

ture Survey (NMCES), which collected data on demographics and health insurance coverage for a nationally representative sample of more than 40,000 individuals. While this survey was completed before the PDA was put in place, many states had passed their own maternity mandates by 1977, so that my calculations will represent underestimates of the extent of discrimination in the early 1970's.<sup>3</sup>

The NMCES contains data on approximately 2,900 females between ages 20 and 40 who were covered through employment-based group health insurance, either in their own name or through a family member. I use "hospital room and board" and "other inpatient services" as comparable illnesses in order to define differential coverage. I find that about 20 percent of women did not have coverage for maternity benefits when they had coverage for either of these comparable illnesses. There were an additional 30 percent of women who received less coverage of the physician's "usual, customary, and reasonable charges" for delivery than for other services, or received only a flat lump-sum provision (less than \$250) for a delivery fee. Thus, at least 50 percent of women faced either differential coverage or benefits.<sup>4</sup>

#### B. *The Cost of Expanding Maternity Benefits*

Estimating the cost of the maternity mandates would require information on the increase in premiums for adding maternity

<sup>3</sup>The data do not contain state identifiers, so I was unable to control for the effects of state laws. Regional controls were not sufficient, due to the widespread passage of state laws in 1976 and 1977. By January 1, 1977, 28 percent of the U.S. population lived in states that had passed mandates; if all firms in these states had completely eradicated differential benefits by the time of the survey, then the discrimination figures should be multiplied by a factor of 1.39.

<sup>4</sup>Another 33 percent of women did not receive any major-medical coverage of normal pregnancies in the presence of major-medical coverage of comparable illnesses. However, it is unclear whether these laws should be construed to require major-medical coverage of normal childbirth.

benefits to a group health package, as well as the cost of increasing the generosity of benefits to the level of comparable illnesses. This sort of data is difficult to gather because nondifferential maternity benefits are now mandated nationally. However, as with all Equal Employment Opportunity Commission legislation, this mandate does not apply to firms with fewer than 15 employees. I have thus been able to gather information on the cost of adding maternity benefits to a small-group plan by using a premium-calculation package from a national insurer. This program is typical of that used by a group-health-insurance salesperson for calculating premiums for a small firm: it inputs the details of the plan and the demographic composition of the workforce and returns the premium cost.<sup>5</sup> For each of several demographic classifications, I use this program to observe the increase in premium cost with the addition of maternity benefits to a typical health insurance plan.

Table 1 presents the cost of adding maternity benefits to a group package for six demographic classifications, in 1990 dollars, in 1978 dollars, and as a percentage of average earnings for each group in 1978. The 1990 cost was deflated to 1978 by using a weighted average of the detailed CPI for hospital services and physician services, where the weights correspond to the fraction of costs in a typical delivery attributable to each.<sup>6</sup> The cost for each group varies widely as a percentage of wages, from less than 1 percent to almost 5 percent. To the extent that there was coverage for childbirth in health insurance plans before the

mandates but differential benefits, the figures in Table 1 will be overestimates of the mandates' costs.<sup>7</sup>

A check on these costs is provided by comparing them to the expected cost of childbirth for an employee in these categories. In 1989, the average cost of a normal delivery was \$4,334 (Health Insurance Association of America, 1989); for married women 20–30 years old, the average probability of having a child in a year was 17.7 percent (U.S. Department of Health and Human Services, 1987). The annual expected cost of childbirth for this group is thus \$767. Compared to the additional cost of \$984 for maternity benefits in family coverage for this age group, this implies an insurance loading factor of 28 percent, which appears reasonable.<sup>8</sup> The high cost of childbirth meant that this mandate was an expensive one for many insured persons.

### C. *The Economics of Group-Specific Mandated Benefits*

The advantages and disadvantages of mandates as tools of social policy are discussed by Thomas G. McGuire and John T. Montgomery (1982), Summers (1989), and Gruber (1992b). Summers presents the efficiency argument for mandates (relative to public provision), noting that when a benefit is provided through the workplace only, individuals will increase their labor supply in order to take advantage of it. Thus, mandates are benefit taxes; if employees value the benefit they are receiving, the increase in labor supply will reduce the deadweight

<sup>5</sup>Since much of the insurance price differential across firm sizes arises from fixed administrative costs, the incremental cost of maternity benefits should not be very sensitive to firm size. The fact that maternity benefits are now mandated nationally for large firms makes this contention difficult to confirm, although, within the range of this program, there is no effect of size differences. My source for this program requested anonymity.

<sup>6</sup>These were two-thirds and one-third, respectively (Health Insurance Association of America, 1989). Unfortunately, the detailed CPI for obstetrics was discontinued in 1978.

<sup>7</sup>These mandates raised the cost of individual workers due to the widespread existence of experience rating in insurance policies in this era (see the appendix to Gruber [1992a]).

<sup>8</sup>Furthermore, the costs in Table 1 will account for the possibility of a nonnormal delivery; in 1989, cesarean sections cost 66-percent more than normal births on average (Health Insurance Association of America, 1989). On the other hand, the fertility rate for working women may be somewhat lower than the average rate overall. A 28-percent loading factor is approximately the average for a firm of 50 employees, according to Congressional Research Service (1988).

TABLE 1—THE COST OF ADDING MATERNITY BENEFITS TO A HEALTH INSURANCE PACKAGE

Coverage	Demographic group	Annual cost (1990 dollars)	Annual cost (1978 dollars)	Cost as percentage of 1978 weekly earnings
Family	20–29-year-old females	\$984	\$360	4.6
Family	30–39-year-old females	\$756	\$277	3.5
Individual	20–29-year-old females	\$324	\$119	1.5
Individual	30–39-year-old females	\$252	\$92	0.9
Family	20–29-year-old males	\$984	\$360	2.9
Family	30–39-year-old males	\$756	\$277	1.7

*Notes:* The source of the data is a premium-calculation program from an anonymous insurance carrier. The cost was calculated for a two-person firm in Maryland. Maryland was a location which was approximately at the midpoint of the locational cost distribution. The results are not sensitive to variations in firm size. Costs are for 1990; they are deflated to 1978 using a weighted average of the detailed CPI for hospital services and physician services, where the weights are  $\frac{2}{3}$  and  $\frac{1}{3}$ , respectively. Costs are normalized by 1978 weekly wages from the May 1978 CPS. For single coverage, wages of unmarried persons are used; for family coverage, wages of married persons are used.

loss of finance. If valuation is full, then there is no deadweight loss from the mandate.

As I showed in an earlier version of this paper (Gruber, 1992a), this analysis is readily extended to the case of a group-specific mandate.<sup>9</sup> However, there may be a number of barriers to full group-specific shifting which are less important when the benefit is extended to everyone in the workplace. Most obviously, there are antidiscrimination regulations which prohibit differential pay for the same job across groups, or which prevent differential promotion decisions by demographic characteristic.<sup>10</sup> Furthermore,

workplace norms that prohibit different pay across groups or union rules about equality of relative pay may have similar effects to antidiscrimination rules. Finally, if the group that benefits is disproportionately composed of workers earning at or near the minimum wage, there may not be scope for shifting to wages.

As Gruber (1992a) shows, these rigidities can cause mandates to have efficiency consequences even in the presence of full valuation, with resulting group-specific unemployment. Furthermore, the distortion will be higher than that which would arise if the group-specific benefit were financed by a payroll tax assessed on all workers. This is because the smaller tax base for a group-specific mandate will lead to a higher tax rate for a given level of expenditures, and the deadweight loss from taxation rises with the square of the tax rate. As Summers (1989 p. 182) states, referring to the effects of these types of impediments, "It is thus possible that mandated benefit programs can work against the interests of those who most

<sup>9</sup>Of course, if there is full valuation, the fact that the benefit is not part of the existing compensation package implies that there must be a market failure in its provision. In fact, there is a strong a priori argument for market failures in many cases of group-specific mandates, such as maternity leave, maternity insurance, or coverage for AIDS, due to problems of adverse selection in insurance markets.

<sup>10</sup>See Ronald G. Ehrenberg and Robert S. Smith (1991) for a discussion of U.S. antidiscrimination legislation, which was in place well before the mid-1970's. In this discussion, I focus only on laws prohibiting discrimination in rates of pay or promotion. In fact, if there are *also* binding restrictions on relative hiring

practices, then employers may be forced to bear the cost of the mandate. If discrimination rules are *only* binding on the hiring side, then they will not impede group-specific shifting in the case of full valuation.

require the benefit being offered. Publicly provided benefits do not drive a wedge between the marginal costs of hiring different workers and so do not give rise to a distortion of this kind.”

Since the efficiency case for mandates rests largely on employee valuation which is reflected in wage adjustments, the empirical work below will estimate the extent of group-specific shifting to wages of the cost of mandated health insurance for maternity. If there is *not* shifting to wages, then either the group that benefits does not value the mandate, or there are impediments to the adjustment of relative wages to reflect that valuation. As a result, there may be large efficiency costs associated with such a policy.

In considering these results, two caveats are in order. First, I am not studying whether mandated maternity benefits represent sensible social policy, but instead only whether there appear to be large efficiency costs from the financing of such policies. In the conclusion, I will consider more broadly the desirability of mandated maternity coverage. Second, I have focused purely on efficiency considerations and have ignored equity considerations about the source of finance of a group-specific mandate. If the goal of a mandate is not to correct a market failure, but rather to provide benefits to some deprived group in society, then full shifting to wages may not be viewed as a desirable outcome. Thus, in considering the results that follow, it is important to understand the goal of government mandate policy: is it to correct a market failure, or to redirect resources across groups?<sup>11</sup>

## II. Data and Identification Strategy

The goal of the empirical work is to identify the effect of laws passed by certain states (experimental states) which affected

particular groups of individuals (treatment group). Identifying this effect requires controlling for any systematic shocks to the labor-market outcomes of the treatment group in the experimental states that are correlated with, but not due to, the law. I do so in three ways in the estimation below. First, I include year effects, to capture any national trends in the earnings of the treatment group. Second, I include state effects, to control for secular earnings differences in the states that passed the laws and those that did not. Finally, I include state-by-year effects, to control for state-specific shocks over this period which are correlated with the passage of these laws. That is, I compare the treatment individuals in the experimental states to a set of control individuals in those same states and measure the change in the treatments' *relative* outcomes, relative to states that did not pass maternity mandates. The identifying assumption of this “differences-in-differences-in-differences” (DDD) estimator are fairly weak: it simply requires that there be no contemporaneous shock that affects the relative outcomes of the treatment group in the same state-years as the law.<sup>12</sup>

The treatment group here comprises those insured workers who are “at risk” for having a child, or whose health insurance covers someone who is at risk for having a child. The controls are other individuals who were directly unaffected by the law. However, the Current Population Survey (before May 1979) contained no information on health insurance coverage. I am thus unable to identify exactly the employees for whom this was a costly mandate.

I address this problem in two ways in the empirical work below. First, I use as the treatment group married women of ages 20–40. This group will contain the individuals for whom the mandate was most costly (according to Table 1), married women of

<sup>11</sup>For the set of laws under study, the answer appears to be the former, as they were part of a larger set of state insurance-market regulations which appeared in the 1970's. See Gruber (1992b) for more detail on these state mandates.

<sup>12</sup>This name derives from the “differences-in-differences” estimator used, for example, by David Card (1990). Such estimation, in my context, would include only state and year effects and would assume that there were no state-specific shocks.

childbearing age. My control group is all individuals over age 40 and single males of ages 20–40. I exclude single 20–40-year-old women, as well as 20–40-year-old married males, who may also be affected by the laws if their insurance covers their wives.<sup>13</sup> This “treatment-dummy” approach has the virtue that it is relatively nonparametric.

Second, I use data on insurance coverage from other data sets to model the likelihood that individuals were covered by insurance and the type of insurance coverage that they receive, and I assign each individual a cost of the mandate based on these predictions and the cost data in Table 1. This approach has the advantage that I use individual variation, rather than differences across broad demographic groups, to identify the impact of the law. However, it has the disadvantage that it imposes strong parametric assumptions. If the functional form for the expected cost of the mandate is incorrect, then the demographic-group dummy may be a more effective means of capturing the law’s impact. Thus, in the empirical work that follows, I will rely on both the treatment-group dummy and the individually parameterized cost measure.

I examine two sets of law changes in order to identify the effect of the maternity mandates. First, I study several of the states that passed the mandates in the mid-1970’s, comparing them to similar states that did not pass mandates. Second, I study the effect of the federal mandate on the states that had not yet passed maternity mandates, using the states that had passed mandates as controls.

I focus on three of the 23 states that passed maternity mandates before the federal PDA: Illinois, New Jersey, and New

York (the “experimental” states). The choice of these three states was motivated by two considerations. First, all of these laws went into effect between July 1, 1976, and January 1, 1977, so that they can be studied simultaneously, and there is sufficient time to examine their impact before the federal law was put into place (October 1978). Second, the data that I use to study the labor-market impact of these laws, the May Current Population Survey, did not identify all states separately before May 1977, but rather grouped some states into regional classifications. Thus, I can only use those states that were identified separately in the survey before 1977.

My set of “nonexperimental” states was chosen using similar criteria: these states had to be separately identified in these CPS’s, and they had to be able to capture any regional shocks to the experimental states. For Illinois, the control states used are Ohio and Indiana; for New Jersey and New York, the controls are Connecticut, Massachusetts, and North Carolina.<sup>14</sup>

The data consist of observations on all individuals in these sets of experimental and nonexperimental locations for two years before the legislation (1974 and 1975) and for two years after the legislation (1977 and 1978). Because I use the May CPS, the 1978 survey collects data from before the passage of the federal law. The means of the data are presented in the left-hand panel of Table 2, for the experimental states and the nonexperimentals (both for the “before” years and for the “after” years), for all wage-earners.<sup>15</sup>

<sup>13</sup>That is, there are three demographic subsets of costly individuals under the mandate, and the treatment-dummy approach focuses on just one (married women). Approximately 56 percent of working married women had insurance from their employers in 1979; as I will show below, the expected cost of the mandate is roughly comparable across these three groups, as a fraction of wages. I therefore focus on married women for expositional ease; the effects on the other groups, as well as the overall treatment effect, is presented below.

<sup>14</sup>Pennsylvania could not be used as a “mid-Atlantic” control because it implemented broad anti-sex-discrimination insurance regulations during 1977, which included a “maternity mandate.” North Carolina is included as a control in order to avoid comparing New York and New Jersey solely to New England; the results are similar if North Carolina is excluded.

<sup>15</sup>Hourly wages are in 1978 dollars. I exclude any individuals who report earning less than \$1/hour or more than \$100/hour in 1978 dollars. I also exclude any persons less than 20 years old or older than 65, and I likewise exclude the self-employed. The means are unweighted.

TABLE 2—MEANS FOR ALL WAGE-EARNERS

Variable	State laws				Federal PDA			
	Nonexperimental states		Experimental states		Nonexperimental states		Experimental states	
	Before law	After law	Before law	After law	Before law	After law	Before law	After law
Percentage female	41.4 [49.3]	43.9 [49.6]	41.4 [49.3]	43.1 [49.5]	44.4 [49.7]	45.6 [49.8]	44.5 [49.7]	45.8 [49.8]
Average age	38.1 [12.6]	37.6 [12.5]	38.9 [12.6]	38.4 [12.6]	37.6 [12.7]	37.5 [12.4]	37.5 [12.7]	37.2 [12.4]
Percentage married	75.0 [43.3]	70.8 [45.5]	71.6 [45.1]	67.9 [46.7]	65.7 [47.5]	63.8 [48.1]	70.0 [45.8]	67.0 [47.0]
Percentage nonwhite	8.8 [28.3]	9.2 [28.9]	10.2 [30.3]	12.0 [32.5]	12.3 [32.8]	13.5 [34.2]	10.9 [31.2]	11.2 [31.4]
Average education	12.1 [2.87]	12.3 [2.81]	12.4 [2.94]	12.7 [2.88]	12.5 [3.04]	12.7 [2.99]	12.3 [2.97]	12.6 [2.88]
Average hourly wage	5.68 [3.31]	5.59 [3.16]	6.61 [3.98]	6.40 [3.62]	6.33 [4.02]	5.88 [3.74]	5.80 [3.81]	5.49 [3.63]
Percentage union	27.0 [44.4]	26.8 [44.3]	33.4 [47.2]	33.8 [47.3]				
Percentage manufacturing	36.5 [48.2]	35.3 [47.8]	28.5 [45.1]	26.6 [44.2]	25.1 [43.3]	23.9 [42.6]	23.6 [42.5]	22.6 [41.8]
Percentage services	29.7 [47.2]	31.5 [46.5]	35.3 [47.8]	37.3 [48.4]	41.4 [49.3]	42.6 [49.4]	39.9 [49.0]	40.9 [49.2]
Weekly cost of mandate	4.01 [1.68]	3.87 [1.65]	3.92 [1.66]	3.85 [1.63]	3.64 [1.59]	3.56 [1.58]	3.71 [1.60]	3.64 [1.59]
Cost/wages	0.020 [0.010]	0.020 [0.010]	0.018 [0.009]	0.018 [0.010]	0.019 [0.012]	0.021 [0.013]	0.021 [0.013]	0.022 [0.013]
N:	9,954	10,180	10,597	10,636	41,772	45,332	48,713	59,647

Notes: Numbers in square brackets are standard deviations. Observations with wages below \$1/hour or above \$100/hour are dropped, as are individuals younger than 20 or older than 65 and the self-employed. See text for definitions of experimental and nonexperimental states and for definitions of before and after years.

There are not many striking differences across the groups of states: the experimental states have higher wages, are more unionized, and are less manufacturing-oriented. Differences in unionization and industry distribution, as well as systematic wage differences across locations, are controlled for in the estimation. Overall, wages fell more in the experimental states than in the nonexperimental states; below, I will assess whether the maternity mandates played any role in this relative fall.

The federal legislation provides a distinct opportunity to study the impacts of increasing the costs of health insurance coverage for maternity. In this case, the states that had already passed maternity mandates are

the nonexperimentals, and those that had not are the experimentals. The advantage of this “experiment” is that by this later date the CPS was identifying all states separately, so that I am able to use as control states all those states that had passed laws by January 1, 1977 (12 states), and as experimentals all states that did not pass laws before 1979 (28 states).<sup>16</sup> These states are more broadly representative of the country

<sup>16</sup>The controls are Arkansas, California, Colorado, Hawaii, Idaho, Illinois, Iowa, Maryland, New Jersey, New York, Tennessee, and Wisconsin. The experimen-

as a whole, which should help to overcome any problems induced by using three (somewhat similar) states as experimentals in the earlier estimation. The disadvantage is that the PDA was more expansive than the state mandates, covering the entire employment relationship, rather than just health benefits. Thus, there may have been some effect on the cost of employing women of child-bearing age in the nonexperimental states as well.<sup>17</sup> Nevertheless, health-insurance industry representatives estimated that the effects on health benefit plans would represent two-thirds of the cost of implementing the PDA (Commerce Clearing House, 1978). To the extent that the net cost difference across these two sets of states represents the health insurance requirements of the law only, the shifting estimates should be comparable to those from the first (state mandates) strategy.

I use the 1978 and 1979 (before), and 1981 and 1982 (after) March CPS to study the impact of the federal law. The March data differ from the May data used earlier in that the earnings and labor-market data are retrospective; that is, individuals are asked for their annual earnings, weeks worked, and usual hours per week in the previous year.<sup>18</sup> The means for the federal law change are presented in the right-hand panel of Table 2. Once again, the two sets

of states are fairly similar: in this case, the experimental states have slightly lower wages and are less manufacturing-oriented.

### III. The Labor-Market Impact of the State Laws

#### A. DDD Estimation

Table 3 illustrates DDD estimation of the effect of the maternity mandates on wages. The top panel compares the change in wages for 20–40-year-old married women in the states that passed the laws to the change for 20–40-year-old married women in the nonexperimental states. Each cell contains the mean average real wage for the group labeled on the axes, along with the standard error and the number of observations. There was a 3.4-percent fall in the real wages of women in the experimental states over this period, compared to a 2.8-percent rise in the real wages of women in other states. Thus, there was a (significant) 6.2-percent relative fall in the wages of women of child-bearing age in states that passed these laws; this is the differences-in-differences estimate of the law's impact. This figure seems somewhat large given the magnitude of the costs identified in Table 1.

However, if there was a distinct labor-market shock to the experimental states over this period, this estimate does not identify the impact of the law. I examine this in the bottom panel of Table 3, where I perform the same exercise for the control group, all those older than 40 and single males ages 20–40. For that group, I do find a fall in wages in the experimental states, relative to the other states, of 0.8 percent. Although not significant, this suggests that it may be important to control for state-specific shocks in estimating the impact of the law.

Taking the difference between the two panels of Table 3, there is a 5.4-percent fall in the *relative* wages of 20–40-year-old married women in the states that passed the laws, compared to the change in relative wages in the nonexperimental states. This statistically significant DDD estimate provides some evidence that the cost of a group-specific mandate is borne by

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tals are Alabama, Alaska, Delaware, the District of Columbia, Indiana, Kentucky, Louisiana, Maine, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Rhode Island, South Carolina, South Dakota, Texas, Utah, Vermont, Washington, West Virginia, and Wyoming. Connecticut was excluded in this part of the study because the state mandated benefit nondiscrimination rules for all groups in 1979.

<sup>17</sup>For example, another major cost of the PDA was the requirement that firms offering disability coverage extend that coverage to include pregnancy.

<sup>18</sup>Thus, the actual labor-market data come from 1977, 1978, 1980, and 1981. The use of the March CPS was dictated by the fact that, starting in 1979, the May CPS only asked earnings information of one-quarter of the sample. The March CPS also does not report data on union status.

members of that group. However, its interpretation is problematic, since there may be important variation in the effect of the law within the set of married 20–40-year-old women; for example, only some of these women will have insurance on the job. This source of variation will be exploited below, where I build individual-specific measures of the impact of the law. First, however, I discuss how the analysis of Table 3 can be expressed within a regression framework.

### B. Regression Framework for DDD Estimation

The sampling variance of the DDD estimate in Table 3 can be reduced by moving to a regression framework, which allows me to control for other observables that affect the outcome variables of interest. The regression equation has the following form:

$$(1) \quad W_{ijt} = \alpha + \beta_1 X_{ijt} + \beta_2 \tau_t + \beta_3 \delta_j \\ + \beta_4 \text{TREAT}_i + \beta_5 (\delta_j \times \tau_t) \\ + \beta_6 (\tau_t \times \text{TREAT}_i) \\ + \beta_7 (\delta_j \times \text{TREAT}_i) \\ + \beta_8 (\delta_j \times \tau_t \times \text{TREAT}_i).$$

In this equation,  $i$  indexes individuals,  $j$  indexes states (1 if experimental state, 0 if nonexperimental), and  $t$  indexes years (1 if after the law, 0 if before).  $W$  is the log real hourly wage,  $X$  is a vector of observable characteristics,  $\delta_j$  is a fixed state effect,  $\tau_t$  is a fixed year effect, and  $\text{TREAT}$  is a dummy for treatment group (1 if treatment, 0 if control).

The analogy of this regression to Table 3 is straightforward. The fixed effects control for the time-series changes in wages ( $\beta_2$ ), the time-invariant characteristics of the experimental states ( $\beta_3$ ), and the time-invariant characteristics of the treatment group ( $\beta_4$ ). The second-level interactions control for changes over time in the experimental states ( $\beta_5$ ), changes over time for the treatment group nationwide ( $\beta_6$ ), and time-invariant characteristics of the treatment group in the experimental states ( $\beta_7$ ). The third-level interaction ( $\beta_8$ ) captures all

variation in wages specific to the treatments (relative to controls) in the experimental states (relative to the nonexperimentals) in the years after the law (relative to before the law). This is the DDD estimate of the extent of shifting of the cost of the mandate to group-specific wages. The set of demographic covariates used includes education, experience and its square, sex, marital status, a marital-status  $\times$  sex interaction, a dummy for nonwhite, a dummy for union status, dummies for 15 major industries, and separate year dummies for 1974 and 1978.

The first row of Table 4 presents the estimates of the third-level interaction from (1),  $\beta_8$ . The coefficient indicates that wages fell by 4.3 percent for the treatment group; it is marginally statistically significant. While this is slightly smaller than the estimate from Table 3, the standard error has been reduced as well, so that the significance is approximately the same. The fact that introducing the other covariates did not have a sizeable impact on this coefficient is comforting, given the experimental interpretation of the estimate.<sup>19</sup>

The next two columns of Table 4 examine the effects of this mandate on hours of work and probability of employment. If this benefit is fully valued, on average, by workers in the treatment group, there should be no change in their net labor input. However, even with full valuation on average, it is possible that the mandate could affect the *composition* of labor input. This mandate represents an increase in the fixed costs of employment and is thus more costly (as a

<sup>19</sup>The other coefficients in the regression are of their expected signs and magnitudes. There is a 1.2-percent fall in wages for the within-state control group. This suggests that the experimental states, on average, saw a negative shock over this period. Alternatively, the mandate itself could be causing this fall for the control group, if the groups are complements or if there is cross-subsidization across groups due to relative pay restrictions. However, given the findings of substantial shifting to group-specific wages, such spillover seems unlikely. The full set of coefficients are reported in Gruber (1992a).

TABLE 3—DDD ESTIMATES OF THE IMPACT OF STATE MANDATES ON HOURLY WAGES

Location/year	Before law change	After law change	Time difference for location
<i>A. Treatment Individuals: Married Women, 20–40 Years Old:</i>			
Experimental states	1.547 (0.012) [1,400]	1.513 (0.012) [1,496]	–0.034 (0.017)
Nonexperimental states	1.369 (0.010) [1,480]	1.397 (0.010) [1,640]	0.028 (0.014)
Location difference at a point in time:	0.178 (0.016)	0.116 (0.015)	
Difference-in-difference:	–0.062 (0.022)		
<i>B. Control Group: Over 40 and Single Males 20–40:</i>			
Experimental states	1.759 (0.007) [5,624]	1.748 (0.007) [5,407]	–0.011 (0.010)
Nonexperimental states	1.630 (0.007) [4,959]	1.627 (0.007) [4,928]	–0.003 (0.010)
Location difference at a point in time:	0.129 (0.010)	0.121 (0.010)	
Difference-in-difference:	–0.008: (0.014)		
<b>DDD:</b>	<b>–0.054</b> <b>(0.026)</b>		

*Notes:* Cells contain mean log hourly wage for the group identified. Standard errors are given in parentheses; sample sizes are given in square brackets. Years before/after law change, and experimental/nonexperimental states, are defined in the text. Difference-in-difference-in-difference (DDD) is the difference-in-difference from the upper panel minus that in the lower panel.

fraction of labor payments) for low-hours employees. If employers are able to lower each worker's wages by the lump-sum cost of the mandate, then neither hours nor employment should change. However, if employers are not able to implement a percentage reduction in pay that is inversely proportional to hours worked, then part-time workers will become more expensive. Employers may thus react by increasing hours and lowering employment, reducing

the cost per hour of the mandate while leaving total labor input unchanged.

Of course, if the wage offset is lower for low-hours workers, workers will demand the opposite outcome; there will be increasing demand for part-time work, with hours falling and employment increasing. Furthermore, since part-time workers may be more readily excluded from health insurance coverage, there may also be a countervailing effect on the employer side, as full-time

TABLE 4—TREATMENT-DUMMY RESULTS ACROSS DEMOGRAPHIC GROUPS

Group	Log hourly wage	Log hours/week	Employment (probit)	Percentage changes in labor input
Married women, ages 20–40	–0.043 (0.023)	0.049 (0.022)	–0.047 (0.048) [–0.016]	1.40
Single women, ages 20–40	–0.042 (0.026)	–0.014 (0.024)	–0.095 (0.064) [–0.030]	–5.95
Married men, ages 20–40	–0.009 (0.018)	0.030 (0.015)	–0.139 (0.072) [–0.038]	–1.08
All treatments	–0.023 (0.015)	0.027 (0.014)	–0.079 (0.039) [–0.024]	–0.88

*Notes:* Standard errors are given in parentheses. The coefficient is that on the third-level interaction in equation (1). The treatment group is the group indicated for each row. The control group is the same as that for Table 3 (all those older than 40 and single men younger than 40). The number in brackets in the employment column is the marginal probability (see text). The change in total labor input is the change in hours at the average-employment/population ratio plus the change in employment in terms of average hours per employed person. This is then divided by the ratio of employment to population to get per-worker figures and then divided by average hours per week for the treatment group to get a percentage change.

employees are replaced with their (uninsured) part-time counterparts. In this case as well, hours would fall, and employment would rise.<sup>20</sup> Thus, the effects on hours and employment are uncertain, even if the cost of the mandate can be shifted to wages on average.

Table 4 confirms the conclusion of full shifting, on average, but does show some compositional changes. In the second column, the dependent variable is the log of weekly hours of work; hours rise by a significant 4.9 percent for the treatment group. I measure employment by a dummy variable which equals 1 if the individual is employed, and 0 otherwise (unemployed or out of the labor force); the employment regressions are run as probits. Table 4 also shows an insignificant fall in employment; it implies that the treatments saw a 1.6-percent fall in employment over this period, relative to the

sets of controls.<sup>21</sup> There is a small net positive effect on total labor input of 0.48 hours per week per worker; this amounts to a rise in hours of about 1.4 percent of average hours per week for the treatment group.<sup>22</sup> This is consistent with the large wage offsets uncovered in the columns for log hourly wage and log hours/week.

As mentioned above, married women represent only one of three groups of workers that are potentially affected by these mandates. The costs of employing single women of childbearing age rose as well, as did costs

<sup>21</sup>This is calculated by using the probit coefficients to predict the probability of employment as if all individuals in the experimental state/years were treatments, then predicting the probability as if none were treatments, and taking the average of the differences of these predictions across individuals.

<sup>22</sup>I calculate the change in total labor input as the change in hours at the average employment-to-population ratio plus the change in employment at average hours per employed person. This is then divided by the employment-to-population ratio to get per-worker figures.

<sup>20</sup>Of course, another option for employers is to drop insurance coverage altogether. Gruber (1992b) finds that there was little effect of other expensive state-mandated benefits on the propensity of firms to offer health insurance.

of employing married males, who may cover their wives in their insurance policies. The effects on these other groups, as well as the effect on all of these groups together, are presented in the remaining rows of Table 4. There are some differences in the results across groups: shifting to wages is small and insignificant for married males, and there is evidence of a sizable fall in total labor input for single females, which is of the same magnitude as the fall in wages for that group. However, the overall results across all groups (i.e., from a regression in which the treatment dummy is 1 for members of all of these groups) is consistent with that for married women only: a decrease in wages, a rise in hours, and a fall in employment, with an overall labor input effect that is small relative to the wage effect.

The reasons for this differential effect across the demographic subgroups may be heterogeneity in the impact of this law across the groups, due to differential probabilities of insurance coverage and costs of extending maternity health-insurance benefits. In the next subsection, I address this heterogeneity by attempting to model the individual-specific cost of these mandates.<sup>23</sup>

### C. Individual Parameterization of the Cost of the Mandates

In assessing the cost of these maternity mandates for each individual, one must consider (i) whether the individual is covered by insurance and whether that insurance provides differential maternity benefits; (ii)

whether this coverage is from the individual's own job or is through a family member; (iii) whether the coverage is for the entire family, or just the individual;<sup>24</sup> and (iv) the individual's (or spouse's) age-specific probability of childbearing. Unfortunately, the CPS does not contain information about insurance coverage during the 1974–1978 period. I have thus calculated *predicted* individual-specific costs, drawing on three sources of data: the estimates of age-specific costs from the premium program; data on the probability of insurance coverage in the 1979 May CPS Pension Supplement; and data on type of insurance coverage from the 1977 NMCES. These cost calculations are described in detail in the appendix to Gruber (1992a); I will briefly review them here.

For all individuals over age 40, and for single males ages 20–40, a cost of zero is assigned. I divide the remaining 20–40-year-olds into three treatment groups: single females, married females, and married males. I use the CPS Pension Supplement, which collects data on employer-provided insurance, to model the probability of insurance coverage as a function of individual demographics, hours of work, union status, and industry of employment. Separate predictor regressions are run for each of the three groups. I then create an extract from the NMCES of all persons in each of these three groups who are employed, who have insurance on the job, and who are the primary insured for their household. For each group I model the probability that a worker will have family coverage versus individual coverage as a function of demographics, industry, spouse's employment status, and spouse's industry.

<sup>23</sup>As I discuss in the next subsection, the expected costs of the mandates across the three groups are roughly equal. The reason for the much smaller wage effect for married males is therefore unclear; it may be that employers perceived the law as having a larger effect on the cost of employing women for other reasons. In any case, the coefficients across the different groups are not significantly different from each other, and the more appropriate test of the effect of the laws is to use the variation in the cost across individuals, which I do next. The overall conclusions from the individually parameterized results below are not sensitive to the exclusion of any one of these three groups from the analysis.

<sup>24</sup>The premium-pricing program described earlier assigns a much higher incremental cost of adding maternity benefits to family coverage than to individual coverage. Presumably, this proxies for differences in the probability of childbearing. Indeed, the relative cost difference between the two types of policies is almost exactly the same as the difference in the relative probabilities of childbearing between single and married women (U.S. Department of Health and Human Services, 1987).

Finally, I use Table 1 to assign age-specific costs: I take a weighted average of the costs of individual and family coverage (where the weights are the predicted probabilities of each type of coverage from the NMCES) and multiply by the predicted probability of having insurance coverage on the job. This yields a predicted weekly cost which varies by the six 10-year age groupings in Table 1.<sup>25</sup> The results of this exercise, for all treatment individuals, are presented at the bottom of Table 2. The cost averages \$3.91 per week, which is 1.9 percent of wages on average; it has a maximum value of 28 percent of wages. The average cost is not appreciably different across the experimental/nonexperimental locations, nor does it change much over time. The weekly cost is highest for married males, reflecting both the high cost for that group from Table 1 and the fact that they are more likely than married females to be the primary insured. However, once costs are normalized by wages, they are roughly equal for married men and women, and slightly lower for single women.

Since a fixed-cost-of-employment mandate is more costly for part-time workers, the predicted cost should also be normalized by hours worked per week, given that the probability of insurance coverage has been appropriately downweighted for that group in the predictor equation. However, for workers who report weekly wages in the CPS, the hourly wage is calculated as the weekly wage divided by hours worked. Thus, if there is measurement error in hours, this may induce a spurious correlation between

hourly wage and hourly mandate cost. I will present results below both with and without the normalization for hours worked, as the results are sensitive to the specification chosen.

The individually parameterized cost measure can be introduced in place of the treatment dummy in equation (4). Since the calculated cost of the mandate is expressed in dollars, it would be interpreted most straightforwardly in a levels wage equation, rather than the log wage specification used earlier. However, since wages are distributed lognormally, a levels wage equation is potentially misspecified. In a log wage equation, the linear cost measure estimates the percentage fall in wages for a one-dollar increase in cost, which varies along the wage distribution. Ideally, this problem could be solved by normalizing costs by individual wages, but this would induce a spurious negative correlation between the dependent and independent variables in the wage regression. Instead, I note that the wage equation can be specified as  $W = (e^{\beta X} + \text{COSTNN})e^{\varepsilon}$ , where COSTNN is the individual hourly mandate cost, and  $\varepsilon$  is a normally distributed error term. Taking logs of both sides of this equation, one obtains:  $\log(W) = \log(e^{\beta X} + \text{COSTNN}) + \varepsilon$ . This nonlinear model thus has both a normally distributed error and a directly interpretable coefficient on the individual mandate cost in dollars.<sup>26</sup>

To the extent that my estimate of the cost of the mandate is correct, a coefficient of  $-1$  on the third-level interaction would in-

<sup>25</sup>In an earlier version of this paper, I also let the cost vary by single-year age-specific probabilities of childbearing. The results were similar; I rely on the 10-year averages because this seems to be the level at which the costs of insurance vary. For married males, I use own age rather than wife's age, since this appears to be the relevant variable for the premium calculation. Ideally, I would also control for the probability that the individual has differential benefit coverage; however, I am not confident enough in my estimates of the incidence of differential benefits to make this an integral part of the analysis. This implies that the result may underestimate the extent of shifting.

<sup>26</sup>The results are quite similar when the cost is included linearly in the log wage regression and normalized by average wages (see Gruber, 1992a). I have also tried entering hourly cost, not normalized by wages, into a linear wage equation: the estimated third-level interaction is  $-3.76$ , with a standard error of  $0.99$ . Furthermore, the coefficient on cost (not normalized by wages) in a log wage regression should fall as the wage rises, since a dollar cost increase represents a smaller percentage of wages. This prediction is testable by cutting the sample by some measure of *permanent* income, such as education. In fact, the shifting coefficient for workers who did not graduate from high school is twice that of those who did, although the estimates are not significantly different from each other.

TABLE 5—WAGES AND LABOR INPUT RESULTS—PARAMETRIZED COST OF THE MANDATE

Coefficient	Specification				
	(i) Log wage	(ii) Log wage (no hours)	(iii) Log wage (full-time)	(iv) Log hours/week	(v) Employment (probit)
$\beta_8$	-2.140 (0.759)	-0.028 (0.019)	-0.037 (0.019)	0.0049 (0.0031)	-0.027 (0.011) [-0.022]
Shifting (percentage):	214	109	156		
N:	41,367	41,367	35,868	41,367	84,305

Notes: All regressions are estimated by nonlinear least squares, as described in the text. Standard errors are given in parentheses. The mandate cost in columns (ii) and (iii) is not normalized by hours worked; shifting is calculated at average hours for the treatments. The sample in column (iii) is restricted to those who work at least 35 hours per week. Column (v) is a probit. Cost is assigned by demographic group average. The number in brackets shows the change in the probability of employment for a \$1 increase in costs.

dicate full shifting to wages. Even if the level of the estimate is incorrect, however, so long as I capture the *relative costliness* across individuals appropriately, I will gain efficiency in estimation over the treatment-dummy case by using individual variation in relative costs.<sup>27</sup>

#### D. Individual Parameterization: Results

Table 5 presents the coefficient of interest from wage regressions with the individually parameterized costs. In column (i), the cost is normalized by hours worked. The regression indicates very sizable shifting to wages, on the order of 210 percent of the cost of the mandate. While this coefficient is significantly different from 0, it is not significantly different from 1, which would imply full shifting to wages.

In column (ii), I remove the normalization of the mandate cost for hours worked. At the mean hours worked for the treat-

ment group, there is 109 percent shifting to wages, but the estimate is not significant. This reduction in the shifting coefficient implies that the fall in wages was greater for the low-hours workers, since they saw the greatest increase in predicted costs when predicted costs were normalized by hours worked. To the extent that these part-time workers were covered by health insurance, this is a sensible finding, since the hourly cost of the mandate was highest for them. However, only 20 percent of individuals who worked less than 35 hours per week in 1979 were covered by health insurance (based on tabulations from the May 1979 CPS). The predictor equation for the probability of insurance coverage controls for hours worked, a dummy for part-time work, and interactions of union status with hours of work and the part-time dummy; nevertheless, it would be disturbing if these results were driven solely by low-hours workers.

Thus, in column (iii) of Table 5, I focus only on full-time workers (35 hours per week or more); over 75 percent of this group is covered by insurance on the job. Cost is not normalized by hours worked for full-time workers, since the noise-to-signal ratio in hours is presumably quite high for this group.<sup>28</sup> The results reveal that the conclu-

<sup>27</sup>Using this estimated cost in place of a demographic dummy does introduce more imprecision into the estimation, since I have predicted the cost from earlier regression models. This imprecision will not be appropriately reflected in the standard errors in my outcome regressions, which will therefore be too small. However, this problem can be shown to disappear as the precision of the predictor equations increases; the predictor equations used fit fairly well, predicting between 73 percent and 85 percent of the cases correctly.

<sup>28</sup>The shifting estimate is similar if cost is normalized.

sion of group-specific shifting was not driven by low-hours workers. The shifting estimate for full-time workers lies between the estimates of columns (i) and (ii).

If these estimates are correct, and there is full shifting of the cost of this mandate to the wages of the treatment group, then there should be no net effect on labor input. I test this in columns (iv) and (v) of Table 5. In column (iv), the dependent variable is the log of hours worked, and the cost is not normalized by average wages or hours.<sup>29</sup> The regression reveals a rise in hours worked by about 0.5 percent of their average level for a \$1 increase in cost.

For the cost measure in the employment regression, I cannot predict individual probabilities of insurance coverage or type of coverage, since I cannot measure industry of employment or hours worked for the unemployed. I thus assign each individual the average probability of insurance coverage and the average probability of family/individual coverage for his or her demographic group (single females, married females, and married males). That is, I assume that if nonemployed individuals were employed, they would face the same probabilities of insurance coverage and buy the same type of insurance as their demographic counterparts who are employed. As before, the employment regression is run as a probit.

As column (v) of Table 5 shows, there is a significant fall in employment for the treatment group. The probit coefficient implies that a \$1 increase in cost would lead to a 0.22-percent fall in probability of employment.<sup>30</sup> Taken together with the hours co-

efficient, this implies a rise in total labor input per worker of 0.63 percent of its average value for a 100-percent rise in cost. This can be contrasted to the estimate of a fall in wages of 4.7 percent of their average value. Thus, the estimated effect on net labor input is small, which confirms the conclusion of substantial shifting to wages.<sup>31</sup>

#### IV. The Federal Experiment

Tables 4 and 5 find extensive shifting of the cost of the maternity mandates to group-specific wages, both in a relatively unrestricted treatment-group-dummy model and in a more parametric specification which tried to capture individual variation in the cost of the mandates. However, these results emerged from the analysis of only three experiments, using a select set of control states. This suggests the desirability of finding an example of a group-specific mandate that affected a broader range of states. The federal PDA of 1978 provides such an example.

The federal law can be studied within the same regression framework used above, with the exceptions that there are no data on union status and that the year dummies are now for 1978 and 1981. These results

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in predicted probability of employment across treatment individuals gives the effects of a dollar increase in costs.

<sup>31</sup>I have also performed two specification checks to assess the robustness of this result. First, I assessed whether one of the law changes was driving the results, by running the regression separately by state, relative to the regional controls. While I found stronger results for New York and weaker results for New Jersey, the result was not driven by any one state's experience; the shifting estimate was significant at the 10-percent level even if New York was excluded. In all cases the net labor-input effect was very small relative to the wage effect, confirming the conclusion of full shifting. Second, in an attempt to include more detailed controls for industry-specific shocks which may be driving the results, I allowed the industry dummies to vary by state and year. This is a very general specification, which allows for state-specific, year-specific, and state  $\times$  year-specific shocks by industry. Nevertheless, the shifting estimate is virtually identical to that in column (i) of Table 5. These results are reported in Gruber (1992a).

<sup>29</sup>While normalizing by hours is once again theoretically appropriate, it would induce a spurious negative correlation between predicted cost and hours worked. Furthermore, the predictor equation for the probability of insurance coverage used here does not control for hours worked, since this would induce a spurious positive correlation.

<sup>30</sup>This is calculated similarly to the earlier case: predicted employment is calculated at average cost and at average cost plus one dollar for the treatment group in the experimental state/years; the average difference

TABLE 6—FURTHER RESULTS—FEDERAL EXPERIMENT

Demographic group/treatment	Specification					
	(i) Log wage	(ii) Log wage (no hours)	(iii) Log wage (full-time)	(iv) Log hours/week	(v) Employment (probit)	(vi) Change in total labor input
Married women, ages 20–40	–0.021 (0.012)			0.0012 (0.0098)	–0.018 (0.028) [–0.0055]	–0.0071
Single women, ages 20–40	–0.014 (0.014)			0.0157 (0.0101)	0.0184 (0.0374) [0.0050]	0.0219
Married men, ages 20–40	–0.008 (0.0012)			–0.0008 (0.0073)	0.0020 (0.0046) [0.0005]	–0.0003
All treatments	–0.0014 (0.0009)			0.0032 (0.0064)	0.0001 (0.0233) [0.00004]	0.0033
Individual parameterization	–0.587 (0.412)	–0.023 (0.010)	–0.017 (0.010)	–0.0002 (0.0015)	0.0007 (0.0068) [0.00005]	–0.0005
Shifting (percentage):	59	90	75			

Notes: The coefficient is  $\beta_8$  in equation (1). Standard errors are given in parentheses. In column (v), the number in brackets interprets the probit coefficient for employment, by calculating the change in probability of employment for a \$1 increase in the cost of the mandate. Change in total labor input is the change in total hours per week per worker for a 100-percent rise in the cost of the mandate. It is calculated by adding the change in hours at average employment to the change in employment at average hours, for a \$1 rise in cost, for the relevant treatment group. This is then divided by average labor input (hours times employment/population ratio) for the treatment group (and multiplied by cost per week in the parameterized cost case) to get the percentage change in labor input for a 100-percent rise in the dollar cost.

are reported in Table 6. The first row repeats the estimation using the demographic dummy, which is once again equal to 1 for married women aged 20–40, and 0 for all others (excluding married 20–40-year-old males and single 20–40-year-old women). There is evidence of shifting to wages, although the magnitude is approximately half that of the earlier regressions and is only significant at the 10-percent level. There is also an increase in hours and a fall in employment, as before, although neither the hours nor the employment coefficient is as large as the respective standard errors. The net effect on labor input is approximately zero. Thus, once again one finds a fall in group-specific wages with no effect on net labor input.

The next three rows of Table 6 examine the other demographic groups. The wage results for both single women and married men are weaker than those for married

women, although in no case are the estimates significantly different from each other. The overall treatment effect is about two-thirds the size of the effect for married women only. The labor-input results are once again mixed; overall, there is a small rise in hours and no effect on employment.

As above, moving to the individually parameterized cost yields further variation which can be used to pin down the extent of shifting to wages more precisely. The individually parameterized cost is calculated in the same way as for the state laws, and this is presented at the bottom of the right-hand side panel of Table 2.<sup>32</sup> The results are quite similar to those from the state laws,

<sup>32</sup>The only difference is that the predictor equations now no longer include controls for union status and its interaction with hours worked and part-time status.

with the cost averaging about 2 percent of wages.

The regression results using the individually parameterized costs are reported in Table 6; the same nonlinear specification described earlier is used. In column (i) the cost is normalized by hours worked, and in column (ii) it is not normalized. Here, the results are reversed from the previous case; the shifting estimate is higher and more significant when cost is *not* normalized. When cost is normalized by hours, the estimate indicates 60-percent shifting, but the estimate is insignificant. When it is not normalized, the shifting estimate rises to 90 percent, once again indicating approximately full shifting to wages, and it is statistically significant.

One reason for the worse results when cost is normalized by hours could be the fact that hours per week in the March CPS are for the previous year, while in the May survey they are the usual hours per week worked currently. The May measure may be a less noisy proxy for actual hours, which makes the estimate of cost per hour more precise and reduces the problems that arise from dividing both the dependent and independent variables by hours. To address this point, as well as to reduce the possible spurious influence of low-hours workers who are not covered by health insurance, I focus only on individuals who worked 35 hours per week or more in column (iii). The non-normalized estimate is similar for this restricted sample, and it indicates shifting of about 75 percent of the cost of the mandate; it is significant at the 10-percent level.

The fifth row of Table 6 reports labor-input results for the individually parameterized costs. Here, the results are the opposite of those uncovered earlier; there is now a *fall* in hours and a *rise* in employment. However, both the hours coefficient and the employment coefficient are completely insignificant, and there is no net effect on labor input. This confirms the conclusion that, on average, the cost of the mandate was fully shifted to wages.<sup>33</sup>

<sup>33</sup>I have also performed the two specification checks described above for the federal law change. First, I

## V. Conclusions

Mandated employer provision of employee benefits is a topic of increasing interest in America today, and many of the proposed mandates are group-specific ones. When there is a market failure in the provision of a particular benefit, a mandate may be an efficient means of correcting the failure. By exploiting the fact that employees value the benefit that they are receiving, mandates act as a benefits tax, and can (in the limit) be as efficient as lump-sum financing of the benefit expansion. However, this argument rests crucially on the ability of wages to adjust freely to reflect employee valuation of the mandated benefit; in the case of group-specific mandates, there may be a number of impediments to such free adjustment of relative wages.

The evidence in this paper supports the contention that there will be group-specific shifting of the costs of mandates such as comprehensive health insurance coverage for maternity. This finding was robust to a variety of different specifications of the effect of these maternity mandates. The fact that the wages of women of childbearing age and their husbands were free to reflect the valuation of these benefits suggests that group-specific mandates do not change the relative cost of employing the targeted group of workers. This is an important precondition for arguing that mandates are an efficient tool of social policy.

It is important to highlight that this paper focused only on the efficiency case for mandates as a tool of public policy. In fact, there are at least two equity arguments

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reran the regressions within each of four regions of the country: the Northeast, the Midwest, the South, and the West. Within each region, there was evidence of wage offsets, with the shifting estimates (from the regressions in which cost is not normalized by hours) ranging from 56 percent to 122 percent. However, none of the estimates was individually statistically significant, and none was significantly different from any of the others. Second, I controlled for industry-specific shocks by once again including industry-by-area-by-year controls. As with the earlier state laws, this had no effect on the coefficient of interest.

against mandates. First, the goal of the mandate may be to redistribute resources toward a certain group in society. In this case, group-specific shifting of the costs of a mandate undoes this redistributive policy. Second, mandates may be relatively regressive policies for financing benefit expansions. As Rodrigo Vergara (1990) shows, a tax on all labor which finances a benefit expansion will be more progressive than a mandate if the distribution of income is sufficiently unequal.

Furthermore, the case of maternity health benefits may illustrate how correcting one market failure can serve to exacerbate another. Health economists have shown that full insurance may lead to large welfare losses through the overutilization of medical resources (Martin S. Feldstein, 1973). Indeed, it is interesting to note that the number of cesarean births per 1,000 population doubled from 1975 to 1981 and that cesarean sections are now the second most frequently performed surgical procedure in the country (Health Insurance Association of America, 1989; U.S. Department of Commerce, 1990). More research is needed on the effects of increased coverage for maternity after the mid-1970's on the costs of childbirth. Did full insurance coverage lead to more costly treatment of the complications of childbirth?

Finally, this analysis has focused solely on the financing of expansions of insurance coverage and has ignored the potential benefits of mandates. If expanded coverage of maternity did lead to a change in the style of treatment of childbirth, this may have had beneficial effects on birth outcomes. Similarly, if maternity-leave provisions increase the continuity of labor-force participation of women, there could be important gains in terms of reducing workplace inequality. There have also been almost 1,000 other mandated benefits at the state level which are similar to these maternity mandates; that is, they dictate the inclusion of minimum levels of certain benefits in existing health insurance plans. Some mandates, such as mental illness and alcoholism treatment, may have substantial "offset" effects in terms of reducing medical expenditures in other parts of the health-care system

(McGuire and Montgomery, 1982). If these benefits can be estimated, they could be weighed against the wage costs to employees in evaluating the efficacy of future workplace benefit expansions.

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## THE INFLUENCE OF POLICIES ON TRADE AND FOREIGN DIRECT INVESTMENT

Giuseppe Nicoletti, Stephen S. Golub, Dana Hajkova,  
Daniel Mirza and Kwang-Yeol Yoo

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## INTRODUCTION

The beneficial effects of foreign trade and foreign direct investment (FDI) on efficiency and growth are generally recognised, and there is a wide consensus that policy should aim at reducing or eliminating hindrances to global trade and FDI integration. Successive multilateral trade rounds, regional trade agreements and bilateral and multilateral investment accords have reduced formal barriers to trade and FDI. The current World Trade Organization (WTO) trade negotiations aim at continuing this trend. However, border barriers are still significant in some countries and industries, in particular in the form of restrictions to FDI. Moreover, there is growing recognition that policies aimed at non-border-related objectives may have a significant impact on the extent of trade and activities of multinational enterprises (MNEs). Thus, unnecessarily restrictive product and labour-market regulations can act as barriers to trade and FDI. The state of the domestic physical infrastructure can also influence countries' capacities to participate in the globalisation of economic activity.

This paper assesses the importance of certain border and non-border policy measures for global economic integration. A number of studies have looked at the influence of economic and/or policy factors on trade and FDI, but most of them tended to deal mainly with geographical and structural factors or focus on a small subset of policy variables (*e.g.* border variables). Building on previous OECD work, this paper takes into account a much broader set of policy variables, including product and labour-market regulation as well as openness to FDI and infrastructure supply. In addition, it looks at both FDI and trade, in a framework in which these two dimensions of global integration respond to similar structural and policy factors. The analysis covers FDI and trade in both goods and services, thus aiming to account for the most important channels of globalisation and dealing with most modes of cross-border service supply.<sup>1</sup> The aim of the paper is threefold:

- First, it describes trends in goods trade, services trade and FDI, as well as border and non-border policies that are likely to affect them. To this end, a large set of policy indicators constructed by the OECD is used, including the new summary indicators for FDI-specific regulations described in Golub (2003). Indicators of tariffs, non-tariff barriers and participation in free trade areas are also used to gauge the stance of policy toward trade openness.<sup>2</sup>

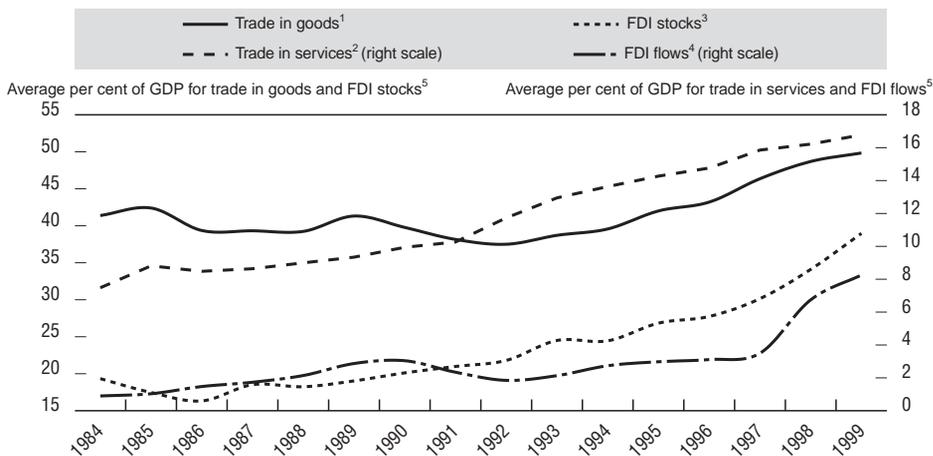
- Second, the paper estimates the impact of these policies on trade and FDI in a framework in which trade flows and the activity of MNEs are seen to be determined jointly and respond to the same market and policy influences.<sup>3</sup> The empirical analysis focuses on bilateral trade and FDI patterns, including bilateral trade in services, but also looks at the determinants of multilateral inward FDI to explain the overall ability of individual OECD countries to attract international investment.
- Third, using the results of the empirical analysis, the paper discusses and quantifies the effects on global integration of policies targeted at removing border and non-border barriers and levelling the playing field for FDI in the OECD area. In this context, the focus is on four widely-advocated policies: removing explicit restrictions to trade and FDI; promoting domestic competition; improving the adaptability of labour markets; and ensuring adequate levels of infrastructure capital. It should be noted at the outset that the results of the simulations are only suggestive of what could happen under different policy scenarios, notably because the empirically-estimated models on which they are based are partial equilibrium, reduced-form models that are unable to account for the general equilibrium interactions between policy changes and trade and FDI flows. Notably, to the extent that diversion effects are important, the simulation results may overestimate the effects of policy changes on the variables of interest.

The paper is structured as follows. The next section documents recent trends in foreign trade and internationalisation of production. The following sections, respectively: discuss the main factors that are likely to jointly affect trade and FDI patterns in OECD countries, focusing on the role of policy; present econometric evidence on the impact of these factors on trade and FDI; use the results of this analysis to perform policy simulations; and conclude. Details about empirical results (including their sensitivity to changes in empirical specifications) and the construction of the underlying data sets can be found in Nicoletti *et al.* (2003).

## RECENT TRENDS IN TRADE, FDI AND THE INTERNATIONALISATION OF PRODUCTION

Focusing on the OECD area, Figure 1 depicts stylised facts on what is commonly called “globalisation”. Over the past decade, both the trade intensity (defined as the sum of exports and imports over GDP) and the foreign investment intensity (defined as the sum of outward and inward FDI positions over GDP) have increased significantly in the average OECD country.<sup>4</sup> The upward trend was particularly pronounced since the early 1990s for FDI and trade in goods, which remained significantly more intense than services trade. The aim of this section is

Figure 1. Trade and FDI patterns in the OECD



1. Trade in goods is defined as the sum of exports and imports of goods realised between a reporting country and the OECD area.
2. Trade in services is defined as the sum of exports and imports of services realised between a reporting country and the world (due to the lack of OECD-specific data, services trade cannot be defined relative to the OECD area).
3. FDI stock is the sum of inward and outward positions of the average country in the OECD area.
4. FDI flows are the sum of yearly investment inflows and outflows of the average country to the OECD area.
5. Simple average of the ratios of OECD countries.

Source: OECD.

to illustrate the main cross-country and cross-industry features of these trends and highlight some of the questions that need to be addressed to understand the economic factors that underlie these phenomena as well as the role that policy can play in favouring the trend towards OECD-wide integration.

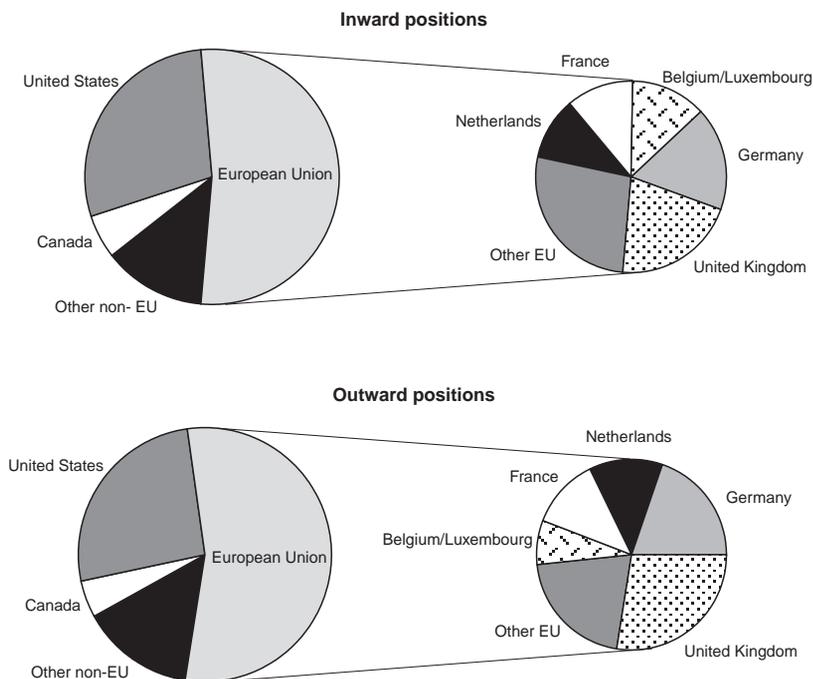
### Trends in FDI

Most global international investment activity goes on among OECD countries and takes the form of ownership changes in existing enterprises (mergers and acquisitions, privatisation), with so-called “green-field” investment playing only a minor role (OECD, 2002).<sup>5</sup> While different forms of FDI might respond to policies differently, the empirical analysis of the paper is based on aggregate financial FDI data since the identification of the different forms of FDI is not possible for many OECD countries. In 1999, the OECD accounted for around 91 per cent of world investment outflows and 74 per cent of world inflows (UNCTAD, 2001). Over the same period, EU countries combined were both the largest recipients and the

largest suppliers of FDI in the OECD area, followed by the United States, Japan, Canada and Switzerland (Figure 2).

The average share of FDI inflows in total business investment went from little more than 3 per cent over the 1980s to almost 11 per cent in the 1990s, bringing about a significant increase in the outward and inward positions of most OECD countries. Given the way these data are constructed (Box 1), part of this increase may be due to a revaluation of existing positions reflecting the sharp increase in equity prices over the same period (OECD, 2002c). Nonetheless, the upward trend in FDI flows points to a rising internationalisation of production over the 1990s. FDI activity dropped sharply in recent years, but most observers attribute the decline to transitory causes rather than to a reversal of the earlier decade-long upward trend.<sup>6</sup>

Figure 2. Distribution of OECD FDI positions in 1998<sup>1</sup>



1. The charts are based on bilateral data. As the method used for valuing FDI positions varies across countries, the resulting shares are undervalued for countries that report book values (e.g. the United States).

Source: OECD.

## Box 1. Trade and FDI data

### Foreign direct investment

Foreign direct investment is a category of international investment made by a resident entity in one country (direct investor) with the objective of establishing a lasting interest in an enterprise resident in another country (direct investment enterprise).<sup>1</sup> This involves both the initial transaction between the two entities and all subsequent capital transactions between them and among affiliated enterprises, both incorporated and unincorporated.

Conventionally, a foreign direct investment enterprise is an incorporated enterprise in which a foreign investor owns 10 percentage or more of the ordinary shares or voting power or an unincorporated enterprise in which a foreign investor has equivalent ownership. Financial FDI data may be geographically biased to the extent that MNEs use strategically-located holding companies to intermediate their investments.

Statistics on FDI transactions and positions are based on the OECD database developed by the Directorate for Financial, Fiscal and Enterprise Affairs (published under the title *International Direct Investment Statistics Yearbook*). These statistics are compiled according to the concepts used for balance of payments (flows) and international investment position (stocks) statistics. Both data sets are available for inward and outward investment with further breakdowns *i*) by partner country and *ii*) by economic sector (according to ISIC Rev. 3 classifications).

Generally, information on inward flows and stocks and on outward flows and stocks is available. The data set used in the empirical analysis covers 28 OECD countries (Luxembourg and Belgium report together; data for Slovakia are not included) over the 1980-2000 period and hence comprises 756 country-partner pairs per year for a potential of 15 876 observations. However, some countries are not yet able to provide complete sets of statistics and, therefore, the panel is unbalanced.<sup>2</sup> An attempt has been made to restore some of the missing data by using available antipodal bilateral data.

Substantial progress has been made towards the agreed international standards for FDI data compilation established by the IMF and the OECD. However, some OECD countries still deviate from the standards in terms of, for instance, the elements included in the disseminated data (income on equity, reinvested earnings and income on debt), the treatment of indirectly-owned investment enterprises or, to a minor extent, definitions used to identify direct investment enterprises resident in the reporting country. The majority of countries report data on investment positions based on book values, but some measure the positions in market values. These issues make the cross-sectional comparability of the data somewhat problematic.

### Foreign trade

Information on international trade has been collected from three sources. Data on trade in goods come from the OECD publication *International Trade by Commodity*

## Box 1. Trade and FDI data (cont.)

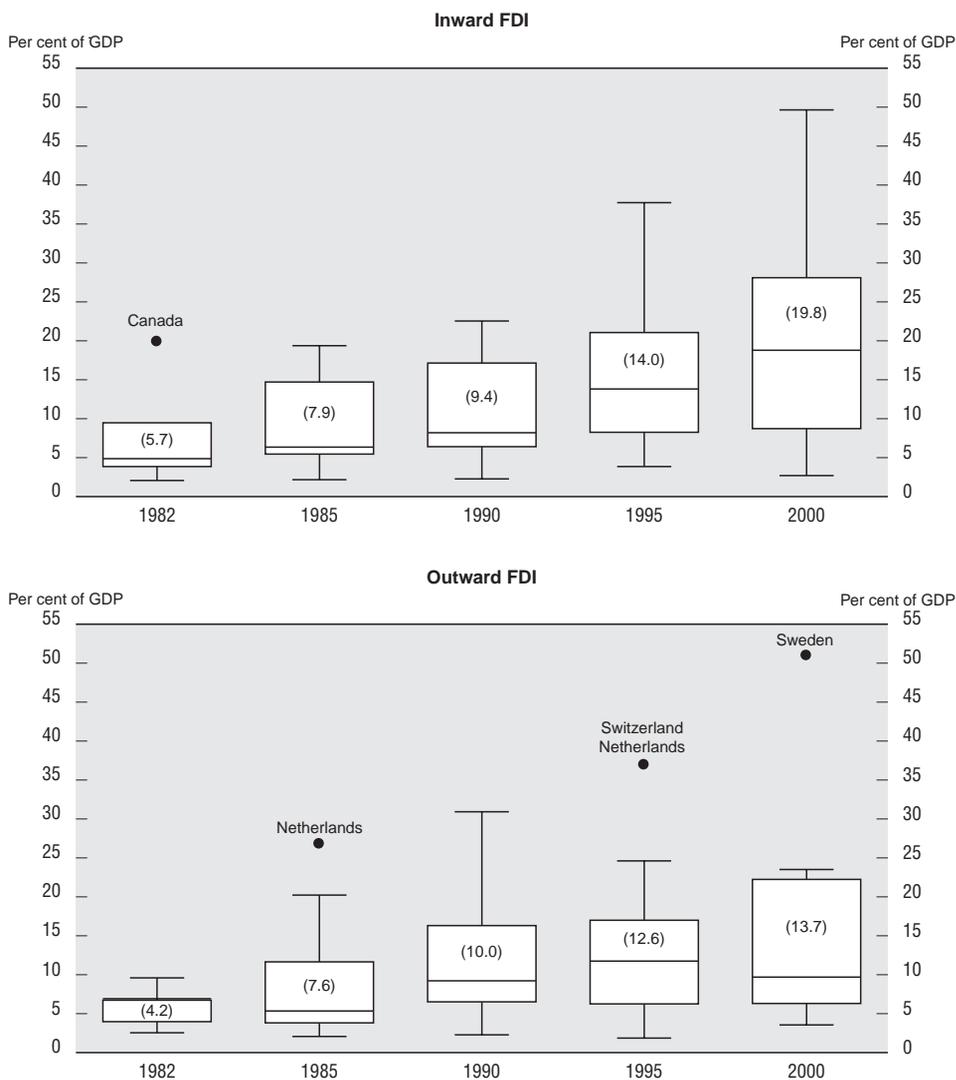
Statistics and match the same format as the financial FDI data, *i.e.* 28 countries and partners during the period 1980-2000. Information on trade in services with partner disaggregation has been taken from the OECD *Statistics on International Trade in Services* 1999-2000. Information is available for two years only, the data covering 20 countries and 27 partners.<sup>3</sup> Data on trade in services by sector (bilateral information is not available) are based on the OECD *Statistics on International Trade in Services* 1990-1999. These data have been so far used for descriptive purposes only.

1. "Lasting interest" implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the direct investor on the management of the direct investment enterprise.
2. For the period 1980-2000, no geographic breakdown is available for the stock data for the Belgium-Luxembourg Economic Union, Spain, Ireland and Turkey; for outward stocks for Hungary and Mexico; and for outflows for Greece and Mexico.
3. Balance of payments statistics on services cover cross-border supply (*e.g.* freight and communications) and consumption abroad (*e.g.* tourism). They exclude the exchange of services that take place through commercial presence (*i.e.* the activity of foreign affiliates) and movement of individuals (*i.e.* temporary presence of service suppliers).

The general move towards internationalisation has been matched by an increasing cross-country dispersion of the amount of FDI supplied and hosted relative to the size of the investor and host countries (Figure 3). By the year 2000, the variances of the instock and outstock as ratios to GDP among OECD countries were larger than two decades earlier, though less so for outstocks. Figure 3 also shows that a number of host countries have relatively large instock ratios, while outstock ratios tend to be more evenly distributed across investor countries. Focusing on inward FDI positions, Figure 4 shows the average instock to GDP ratios of individual countries in the 1980s and 1990s. It suggests that the largest contribution to the increase in the cross-country dispersion of the OECD instock was provided by Ireland, Belgium and the transition countries, in which inward FDI surged during the 1990s.

The variance of the multilateral measures masks very different cross-country patterns at the bilateral level. First, in 1998 (the latest year for which bilateral data are reasonably complete) the number of host partners varied across investing countries, ranging from below 10 for Hungary and Turkey to above 20 for many EU countries, the United States and Canada. Second, the extent to which countries

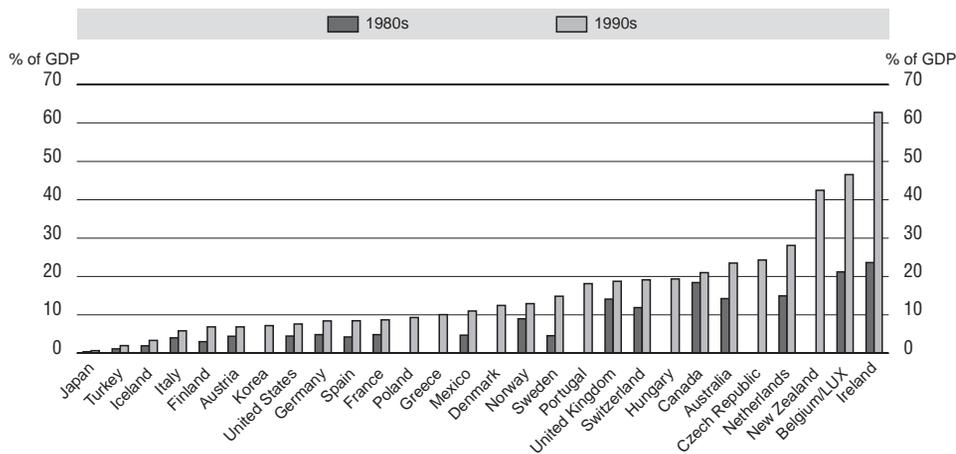
Figure 3. **Inward and outward FDI positions: trends and cross-country dispersion<sup>1</sup>**  
Unweighted OECD average position<sup>2</sup>



1. The box plot shows, in each year, the median OECD value of the inward or outward stock of FDI (the horizontal line in the box), the third and second quartiles of the cross-country distribution (the edges of each box) and the extreme values (the two whiskers extending from the box). Dots identify outlier observations.

2. Data in parentheses are unweighted average GDP ratios.

Source: OECD.

Figure 4. Inward FDI positions in OECD countries, 1980s and 1990s<sup>1</sup>

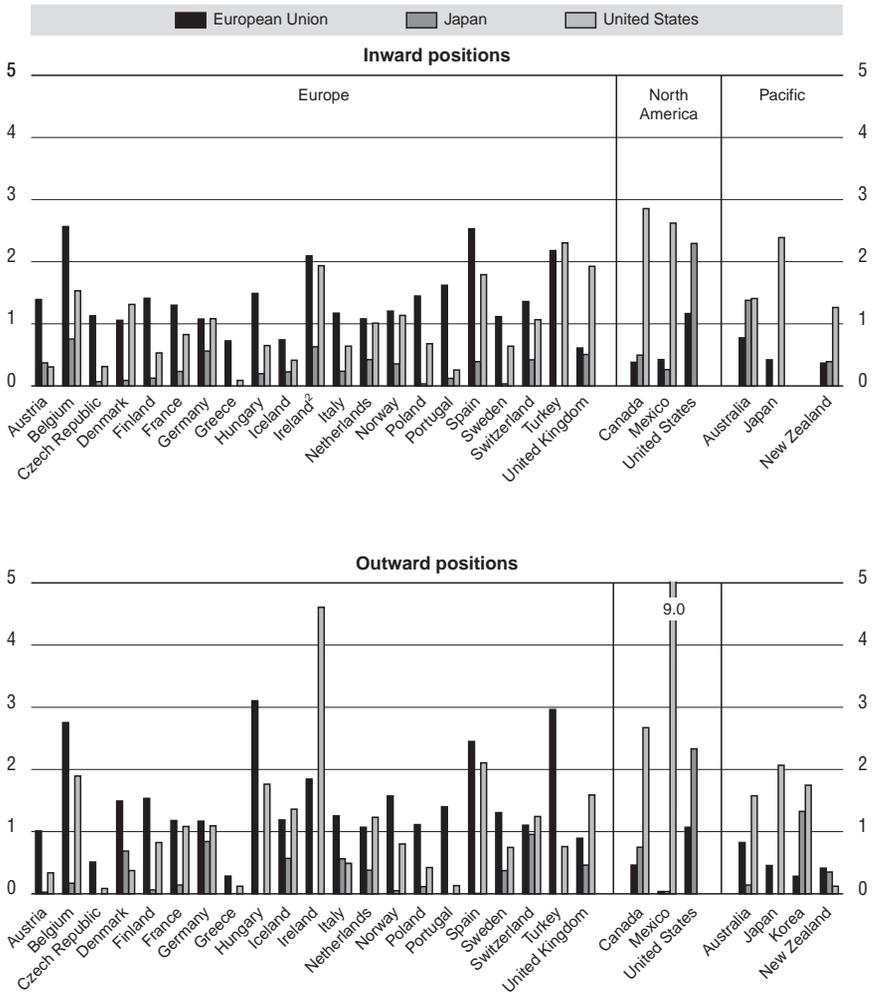
1. Average values over the two periods. For countries where FDI position data are not available, values of bilateral stocks reported by their OECD partners were summed up to obtain an approximate measure of multilateral FDI stocks.

Source: OECD.

geographically specialise their FDI across a given number of partners also differs. While many countries tend to evenly distribute their FDI across partners, some of them (*e.g.* Canada, Korea, Denmark and the United Kingdom) tend to concentrate FDI on a few host countries. Similarly, some countries (Austria, Canada, the United Kingdom and Mexico) mostly host FDI originating from just a few countries.

The indicators depicted in Figure 5 report patterns of geographical specialisation focusing on inward (and outward) FDI from (to) the European Union, the United States and Japan – where specialisation is defined in terms of a country hosting (supplying) a share of FDI from an investor country (to a host country) larger than the share hosted (supplied) by the OECD. Geographical factors are clearly important in explaining patterns of FDI instocks (Panel A): most European countries specialise in hosting FDI originating from EU countries; Canada, Mexico and Ireland specialise in hosting FDI from the United States; and Pacific shore countries specialise in hosting FDI from the United States and/or Japan. Interestingly, however, the degree of geographical specialisation varies significantly both within the same area and relative to countries located outside the area. On the whole, the dispersion of specialisation patterns suggests that geographical factors are important, but they cannot explain the entire variability in the data.<sup>7</sup>

Figure 5. **Patterns of geographical specialisation in inward and outward FDI<sup>1</sup>**  
Average 1995-1998



1. Inward geographical specialisation is defined as the revealed tendency of a country to host a share of FDI from an investor country (European Union, Japan, United States), which is larger than the share hosted by the OECD as a whole. Outward geographical specialisation is defined as the revealed tendency of a country to invest a share of FDI in a host country (European Union, Japan, United States) which is larger than the share invested by the OECD as a whole. A country is "geographically specialised" in investing to (or in hosting from) another country if the indicator is above unity. For computational details, see Annex.

2. Data for FDI from Japan are for 1991-1994.

Source: OECD.

## Trade developments: goods and services

As pointed out in Figure 1, both goods and services trade flows rose faster than GDP over the past decade in the OECD area. At the same time, the intensity of trade in services remained much lower than in goods. Underlying these OECD-wide stylised facts are wide cross-country differences in export and import intensities and in the geographical specialisation of the exports of individual OECD countries.

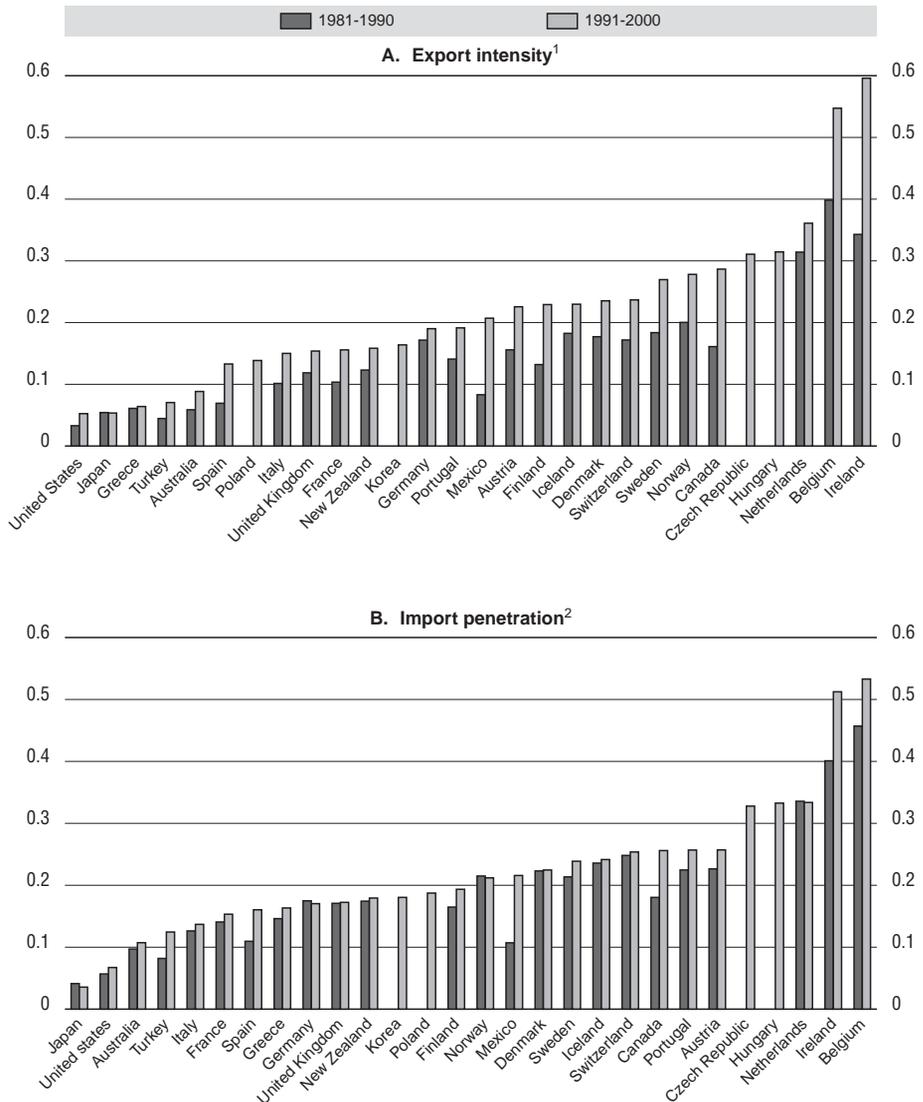
### *Goods trade*

Figure 6 shows average intensities of goods trade within the OECD area for individual member countries over the 1980s and the 1990s. The intensity of exports to OECD countries (defined as the share of exports in GDP) increased in all countries except Japan,<sup>8</sup> partly reflecting a stronger propensity of the Japanese economy to export to non-member Asian countries over the past decade (Panel A). The increase was particularly noticeable in Ireland and Mexico, which almost doubled their OECD export intensity between the two periods, but significant increases also took place in Canada and the northern European countries. It is also known that the increase in OECD export intensities over the 1990s has been marked for transition member countries.

The increase in trade intensities over the past two decades has probably been matched by rising intra-firm trade related to the widening role played by MNEs in the OECD area (OECD, 2002d). Indirect evidence of this is provided by the rising share of intra-industry trade, especially in transition countries, which parallels the sharp increase in FDI inflows over the same period. Direct measures of intra-firm trade, which are available for only a few countries (notably the United States, Japan and some Nordic countries), also point in this direction. The available data suggest that intra-firm trade among MNEs and foreign affiliates located in high-income OECD countries mainly involved the export of final goods for sale in local markets, reflecting horizontal-type FDI, while trade between MNEs located in high-income countries and their affiliates in middle-income OECD countries also involves imports of intermediate goods to be further manufactured and sold in the country of the parent company (or other countries), reflecting vertical-type FDI.

A cursory view at Figure 6 also suggests that both the location and the size of the countries are important factors determining the propensity to trade. For instance, economies that are large, such as Japan and the United States, or geographically remote relative to major OECD markets, such as Australia, have relatively low trade intensities, reflecting either a wide internal market or high transport costs. By contrast, economies that are small and well-connected to large

Figure 6. Intensity of goods trade within the OECD area, 1980s and 1990s



1. Export intensity is defined as the ratio of exports to GDP.

2. Import penetration is defined as the ratio of imports to domestic absorption.

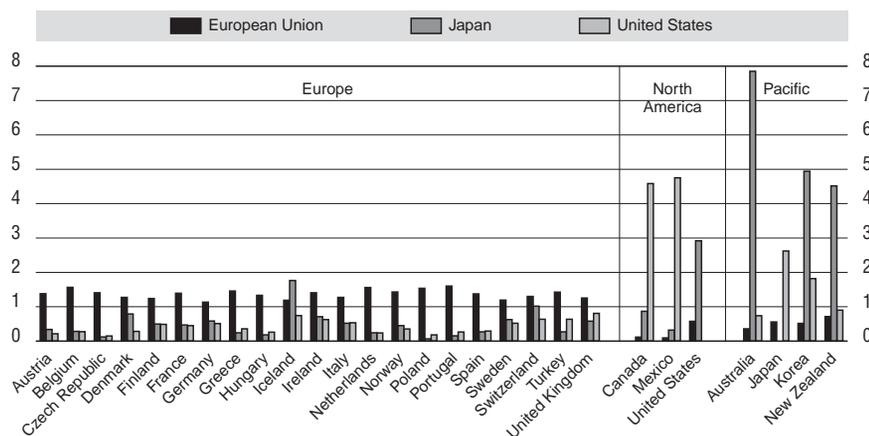
Source: OECD.

neighbouring countries, such as Belgium and the Netherlands, have high trade intensities. However, location and size cannot fully explain the cross-country patterns of export intensities, because there are small countries with low intensities, such as Greece, and relatively remote countries with higher intensities, such as New Zealand and Korea.

Using the same indicator as for FDI, Figure 7 shows the patterns of geographical specialisation over the 1990s in exporting to the European Union, Japan and the United States. The relative distance of each country from the three destinations seems to matter. Japan is the favourite destination of exports from Australia, New Zealand and Korea; and the United States is the favourite destination of exports from Canada and Mexico. Exports from European countries are more uniformly distributed, though still biased towards EU destinations. Clearly, as neighbouring countries are often linked by free-trade agreements (such as the EU Single Market or NAFTA), the transport cost effect underlying these patterns is likely to act in parallel with a free-trade area effect (see below). Indeed, develop-

Figure 7. **Patterns of geographical specialisation in goods exports to the European Union, Japan and the United States<sup>1</sup>**

Average of the 1990s



1. Geographical specialisation in goods trade is defined as the revealed tendency of a country to export a share of exports of its total exports to a partner country, which is larger than the share exported to that country by the OECD in total OECD exports. A country is "geographically specialised" when the indicator is above unity.

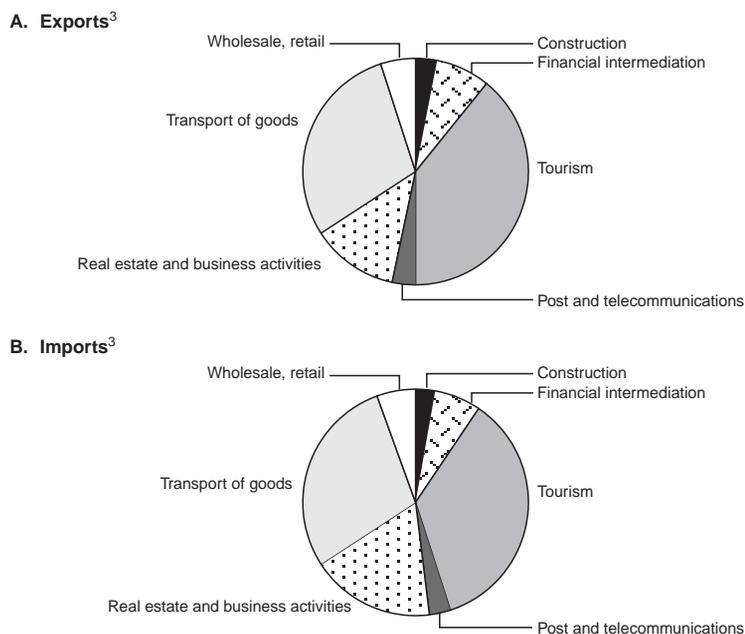
Source: OECD.

ments in both European and North American countries suggest that free-trade agreements such as the EU Single Market and NAFTA may have borne their fruits over the 1990s.

### Trade in services

Figure 8 shows the average industry structure of OECD trade in services in 1999 as recorded in balance of payments statistics on multilateral trade, which cover only a subset of modes of cross-border services supply (notably excluding commercial presence and movement of individuals) (see Box 1). According to these figures, most services trade, whether exporting or importing, relates to tourism (around 30 per cent) and transport (around 25 per cent), followed by business

Figure 8. **Composition of services trade in the OECD area,<sup>1</sup> 1999**  
OECD average<sup>2</sup>



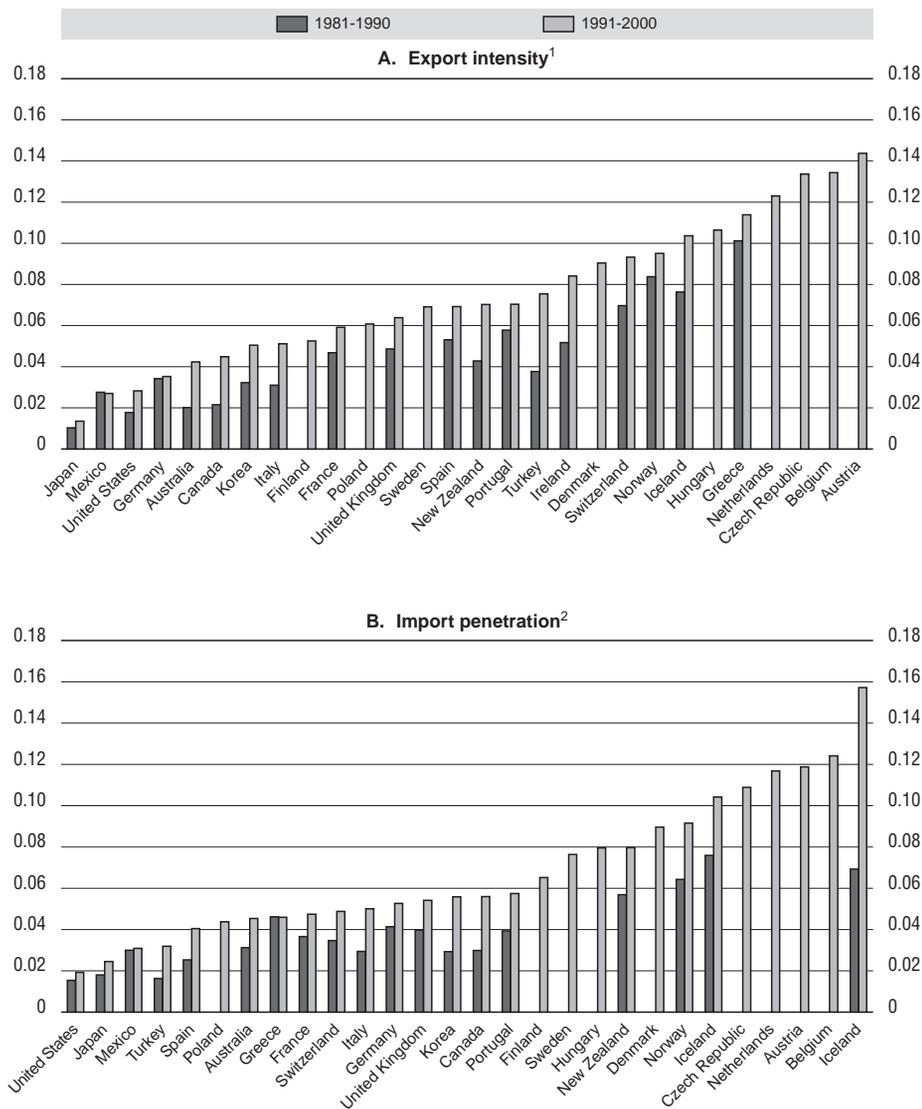
1. Service trade reported by balance of payments statistics includes only cross-border supply and consumption abroad. Service supplied through commercial presence or movement of individuals are excluded.

2. Simple average.

3. Ratio of exports or imports in each industry to total exports or imports.

Source: OECD.

Figure 9. Intensity of global trade in services, 1980s and 1990s



1. Export intensity is defined as the ratio of exports to GDP.

2. Import penetration is defined as the ratio of imports to domestic absorption.

Source: OECD.

services (12 per cent) and financial services (6 per cent). The composition of services trade is similar at the individual country level. In other words, a large share of trade in services is related to international movements of people and manufactured goods. Yet, the most striking feature of services trade is that both export and import intensities are several times lower than the corresponding trade intensities for goods in all OECD countries for which data are available, with the ratio of manufacturing to services trade flows generally ranging from three to six in most countries. Even though such gaps could be narrowed once cross-border supply through commercial presence (*i.e.* FDI) is taken into account, differences in the trade intensities of goods and services are puzzling.

Lower services trade intensities are often related to the cost of transport, which is, for some services, much higher than the cost of shipping manufactured goods.<sup>9</sup> Also, the influence of geographical and structural factors, such as location and size of the economy, on trade in services and goods may differ. Cross-country patterns of export intensities and import penetration ratios suggest that these factors play partly the same role as for trade in goods (Figure 9). Trade is strong in relatively small and well-located countries – such as Austria, Belgium, the Netherlands and Ireland – and weak in relatively large or remote countries – such as the United States, Japan and Australia. However, these patterns are less clear than for goods trade and, indeed, the cross-country correlation between export intensities in goods and services is relatively low (around 0.2), though the correlation of import penetration ratios is higher (around 0.6). This suggests that other forces are impinging on the openness of OECD economies to trade in services.

### **Twin developments in FDI and trade**

The discussion of trends and patterns in FDI and trade offers *prima facie* evidence that the two phenomena are closely linked: both increased sharply over the past decade; both seem to be at least partly affected by factors related to distance, location and size of the economy; and in some cases trade openness seems to go hand in hand with high FDI and foreign affiliate activity, such as in Ireland and Belgium. Table 1 provides further evidence concerning this stylised fact at a finer level of detail. It reports the correlations between different measures of bilateral trade and bilateral FDI over the period 1980-2000 as well as in sub-period averages. All correlations are positive and significant at conventional levels, with particularly high coefficients between trade measures and FDI outstocks and instocks.

Although these correlations may imply a testable hypothesis that to some extent trade and FDI may be driven by the same set of economic factors, they are not necessarily evidence in favour of complementarity between FDI and trade. As discussed in the next section, at the firm or industry level the relation-

Table 1. Bivariate correlations between bilateral trade and FDI<sup>1</sup>

Bilateral FDI measures	Outward position	Inward position	Outward investment	Inward investment	Outward position (% of GDP)	Outward investment (% of GDP)
<b>Bilateral trade measures</b>						
<b>A. All available years</b>						
<b>Manufacturing exports</b>	<b>0.64</b>	<b>0.57</b>	<b>0.39</b>	<b>0.34</b>		
	(5 998)	(5 963)	(7 930)	(7 610)		
<b>Manufacturing imports</b>	<b>0.59</b>	<b>0.63</b>	<b>0.34</b>	<b>0.37</b>		
	(5 997)	(5 961)	(7 930)	(7 610)		
<b>Services exports<sup>2</sup></b>	<b>0.81</b>	<b>0.83</b>	<b>0.50</b>	<b>0.58</b>		
	(344)	(347)	(559)	(498)		
<b>Services imports<sup>2</sup></b>	<b>0.77</b>	<b>0.67</b>	<b>0.45</b>	<b>0.53</b>		
	(344)	(347)	(559)	(498)		
<b>Total exports</b> (manufacturing plus services)	<b>0.64</b>	<b>0.58</b>	<b>0.36</b>	<b>0.40</b>		
	(344)	(347)	(559)	(498)		
<b>Total imports</b> (manufacturing plus services)	<b>0.61</b>	<b>0.63</b>	<b>0.35</b>	<b>0.41</b>		
	(344)	(347)	(559)	(498)		
<b>B. Average 1990-2000</b>						
<b>Manufacturing exports</b> (% of GDP)					<b>0.73</b>	<b>0.71</b>
					(298)	(321)
<b>C. Average 1998-2000</b>						
<b>Total exports (% of GDP)</b>					<b>0.61</b>	<b>0.57</b>
					(67)	(76)

1. Number of observations in parentheses. All correlations are significant at 5 per cent levels.

2. Balance of payments definition.

Source: OECD.

ship between FDI and manufacturing trade crucially depends on whether FDI is aimed at accessing foreign markets or fragmenting production in stages. Aggregate evidence concerning FDI and trade is, therefore, the result of conflicting influences and may only be interpreted as suggesting that, overall, one type of FDI dominates the other or, alternatively, that both FDI and trade are correlated to a third variable (*e.g.* income). By contrast, services trade and FDI can be expected *a priori* to be complementary, because establishing commercial presence abroad generally brings stronger services trade in terms of transport (*e.g.* supplying goods to foreign affiliates in the distribution sector), communications (*e.g.* data transactions with foreign affiliates in the financial, telecommunications or tourism sectors), etc. FDI in the services sectors indeed accounted for up to 65 per cent of total FDI flows (OECD, 2002c). In this connection, it is interesting to note that, among the correlations in Table 1, those between FDI and services exports and imports (which due to lack of data focus on the most recent period) are the highest.

## POLICY AND OTHER DETERMINANTS OF TRADE AND INTERNATIONAL INVESTMENT

Two broad sets of factors jointly affect trade and FDI: *non-policy factors* – including the effects of gravity (*e.g.* market size and distance) and factor proportions (*i.e.* relative endowments of different inputs) – and *policy factors*. The influence of these factors (*i.e.* the sign of the relationship and its intensity) is not necessarily the same across FDI and trade. In particular, it may depend on whether FDI is of the horizontal or vertical type (Box 2). Moreover, their influence may also differ in some cases across trade in goods and trade in services.

With an eye to the interdependency between trade and FDI, this section principally looks at key policy factors, grouping them into four categories: openness, product-market regulation, labour-market arrangements and infrastructure.<sup>10</sup> Some of these policy channels restrict market access by exporters and foreign investors. For instance, non-tariff barriers and FDI restrictions raise border obstacles to trade and investment. Other border and non-border policies make trade and investment unprofitable, for instance by increasing the relative cost of foreign *versus* home goods (*e.g.* tariffs or regulations that raise production costs) or decreasing the net returns of MNEs when they invest abroad. Finally, policies can also raise the overall cost of the transaction by affecting the costs of inputs that both the exporter and importer must use in order to implement the exchange (*e.g.* transport or communication services). Alternatively, policies can facilitate trade and FDI, for example by creating areas of free trade, improving the business environment in which exporters and MNEs operate or reducing the cost of transactions through the development of the necessary infrastructure.<sup>11</sup> This section shows by means of newly-developed indicators that approaches often differ across countries in each of the four policy categories and, when possible, offers *prima facie* evidence that these differences may be relevant for trade and FDI.

### Openness

As noted above, openness of a country to trade and FDI is assessed here in terms of policies that create (or eliminate) border barriers for exporters or investors, measured by indicators of tariff and non-tariff barriers, statutory restrictions to FDI and multilateral agreements that create areas of free trade among signatory countries.

#### **Tariff and non-tariff barriers**

Figure 10 reports the evolution of average (import-weighted) most-favoured-nation (MFN) tariff rates and import coverage of non-tariff barriers from 1988 to 1996, the latest year for which time-series data are available.<sup>12</sup> The conclusion

<sup>24</sup>

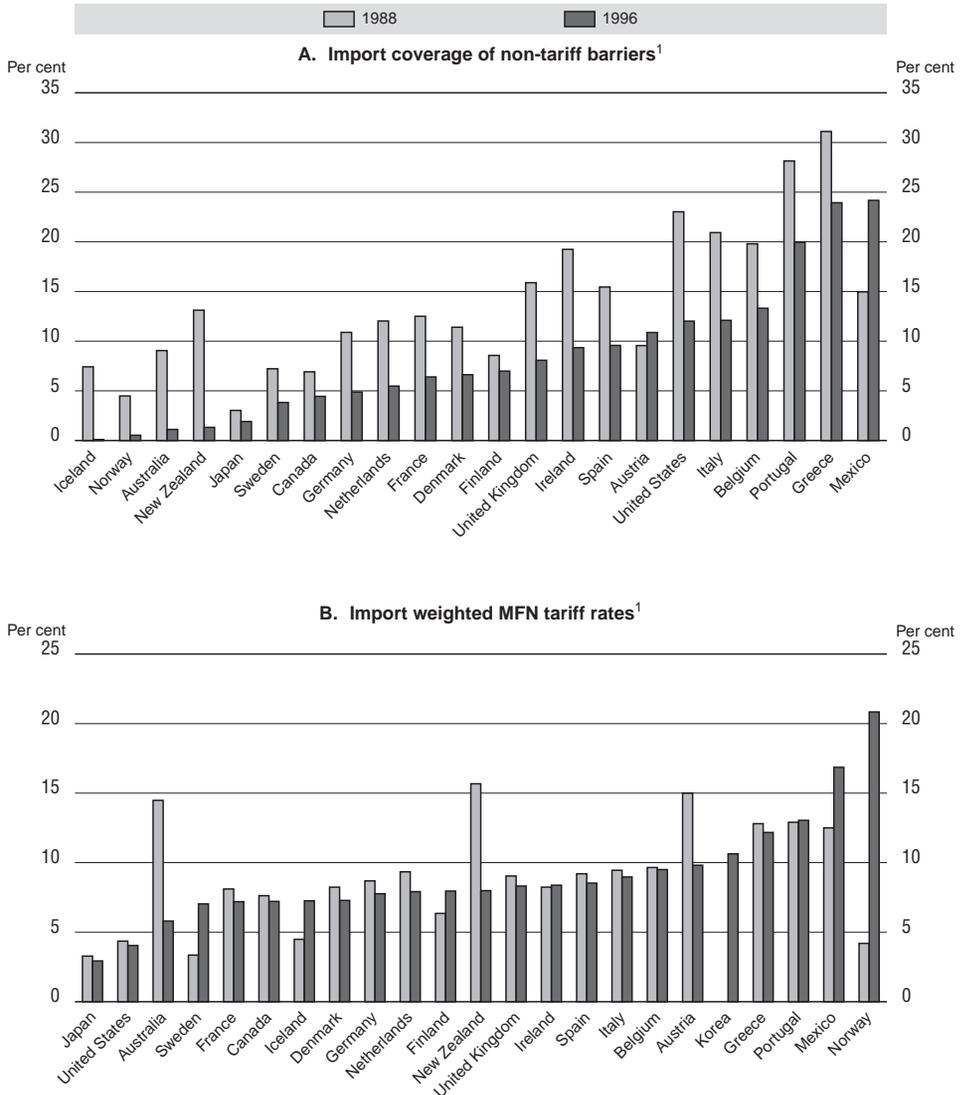
**Box 2. Trade and different types of FDI**

As pointed out by recent research, the interdependence of trade and FDI derives from the fact that the decision to export or invest abroad for producing locally is increasingly taken by the same unit, the multinational enterprise. This is clearest in the so-called “knowledge-capital” theory of the MNE (Markusen, 2002; Markusen and Maskus, 2001), which builds on previous work by Dunning (1981) and Buckley and Casson (1985). This theory notes that three types of firms exist in each country: purely domestic firms, which have headquarters and plants that produce only at home for local or export markets; the horizontal MNEs, which have headquarters at home and production plants both at home and abroad that produce the same goods; and the vertical MNEs, which fragment different stages of production by having headquarters at home and production plants in different foreign countries that produce different intermediate or final goods. Since the objective of the horizontal MNEs is to access foreign markets, trading or investing abroad are two substitute activities. They will choose one or the other depending on their relative returns, which depend among other things on the cost of trade, the cost of FDI and the firm-level economies of scale they can enjoy by duplicating production plants in foreign countries.\* By contrast, the objective of vertical MNEs is to take advantage of cross-country comparative advantage patterns by locating plants in different countries in order to specialise in different stages of production. Therefore, trade and FDI are complementary activities: vertical MNEs will typically export components to foreign affiliates and re-export to the home (or other) markets the goods produced abroad. Recent evidence suggests that horizontal MNEs may be prevalent in the OECD area, partly reflecting the increasing similarity in factor costs and endowments among member countries (OECD, 2002d). However, MNEs’ strategies have also been shown to vary across OECD countries, with horizontal strategies dominating in the United States (Markusen and Maskus, 1999) and vertical strategies dominating in Sweden (Mathä, 1999) and France (Soubaya Camatchy Ariguelou, 2002). See OECD (2002e) for a discussion of the relationship between trade and FDI.

\* Firm-level economies of scale arise when two-plant firms have fixed costs that are less than the double those of a single-plant firm. Firm-level economies of scale and trade costs are crucial elements for explaining the existence of horizontal FDI, as first pointed out by Markusen (1984).

of global and regional trade agreements (Box 3) during this period was reflected in a decline of both non-tariff and, to a lesser extent, tariff barriers within the OECD area. However, cross-country differences in average barriers still persist. Indeed, using a recent data set that includes a wider set of tariffs at the bilateral level, Figure 11 shows that in 2001 the dispersion of average (unweighted) applied tariff

Figure 10. Manufacturing trade liberalisation in the OECD area, 1988-1996



1. OECD calculations based on UNCTAD data. Aggregation from 2-digit level tariffs to national level using sectoral value-added weights. See annex for details on sources and methodologies.

Source: UNCTAD, OECD.

### Box 3. Trade agreements

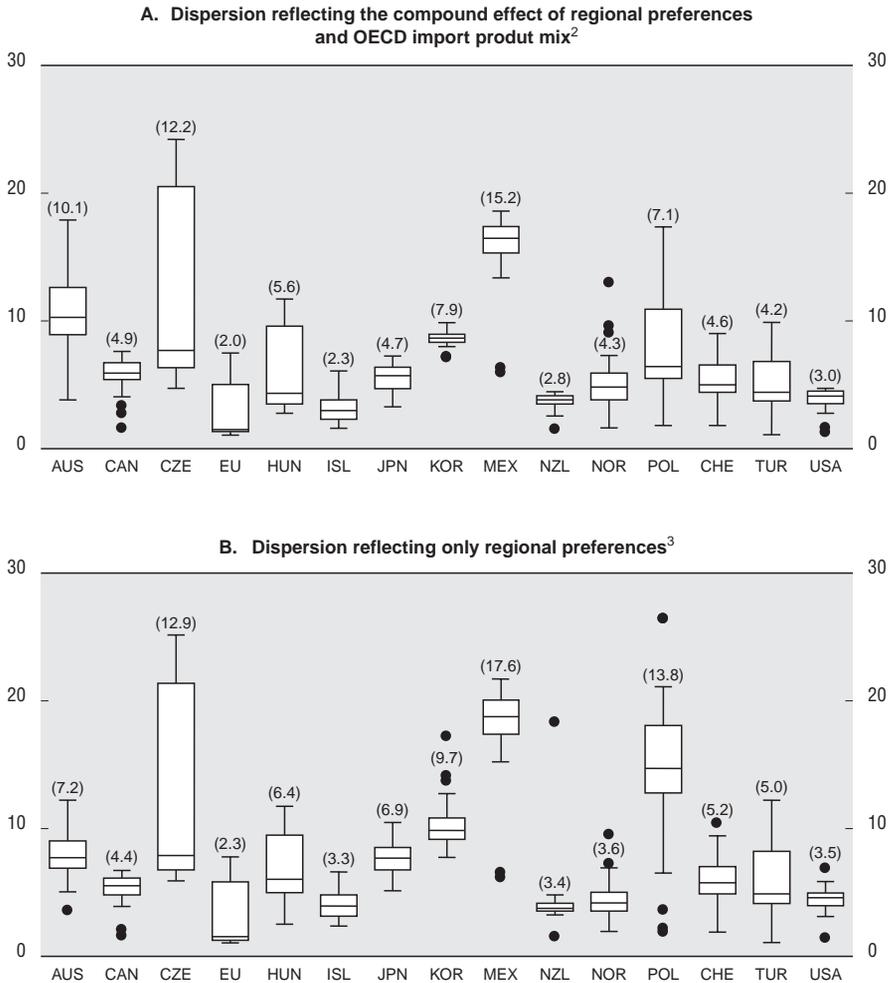
Almost all countries participate in one or more regional agreements, either as regional members or by virtue of bilateral agreements between regional groups and individual countries. In addition, there are bilateral agreements between countries (*e.g.* the accord between the United States and Chile). These agreements involve preferential trade provisions. However, the degree of integration they imply varies considerably. The main agreements can be classified, in order of increasing integration, as follows:

1. *Agreements to consult and co-operate*, without any binding harmonisation of policies, such as the Asia Pacific Economic Co-operation Group (APEC), signed in 1989, or the Association of South-East Asian Nations (ASEAN), signed in 1967 (whose members are currently planning to create a free trade area).
2. *Free-trade areas*, in which trade is liberalised within the group, but no common external tariff is adopted, such as the North American Free Trade Agreement (NAFTA), signed in 1994, the European Free Trade Area (EFTA), signed in 1960, and numerous bilateral agreements. Such arrangements require the establishment of rules of origin for imported products. They may cover different sets of transactions and imply different levels of integration among signatory countries. For instance, NAFTA includes both trade and FDI provisions.
3. *Customs unions*, whose members agree to common external tariffs, such as Mercado Común del Sur (MERCOSUR), signed in 1995, and several other agreements in developing countries.
4. *Common markets*, with free movement of labour and capital, and where economic integration transcends a customs union towards a fuller harmonisation of economic regulations, such as the 1992 European Single Market.
5. *Economic unions*, involving full harmonisation across a range of economic policies, a direction taken in 1998 by the European Union with the Maastricht treaty and the single currency.

Economic theory suggests that preferential trade liberalisation can increase welfare when it results in “trade creation” – trade that is consistent with comparative advantage – or reduce welfare in the case of “trade diversion” – when trade is diverted to less efficient partner countries. Dynamic gains resulting from scale economies and increased competition are also important, as is the potential for “deeper integration” amongst participating countries. On the other hand, complex rules of origin can lead to high administrative costs and possibly corruption. Another point of contention is whether regional blocs are “building blocks” or a “stumbling blocks” towards multilateral liberalisation. Regional integration is, in principle, contrary to the fundamental GATT/WTO principle of non-discrimination, but the WTO does allow such agreements in practice as long as substantially all trade is liberalised (art. XXIV). For more details, see OECD (2001c and 2002f), Panagariya (1999) and Hoekman and Schiff (2002)

Figure 11. **Median and dispersion of bilateral applied tariffs by importing countries in 2001<sup>1</sup>**

(Average values in parentheses)



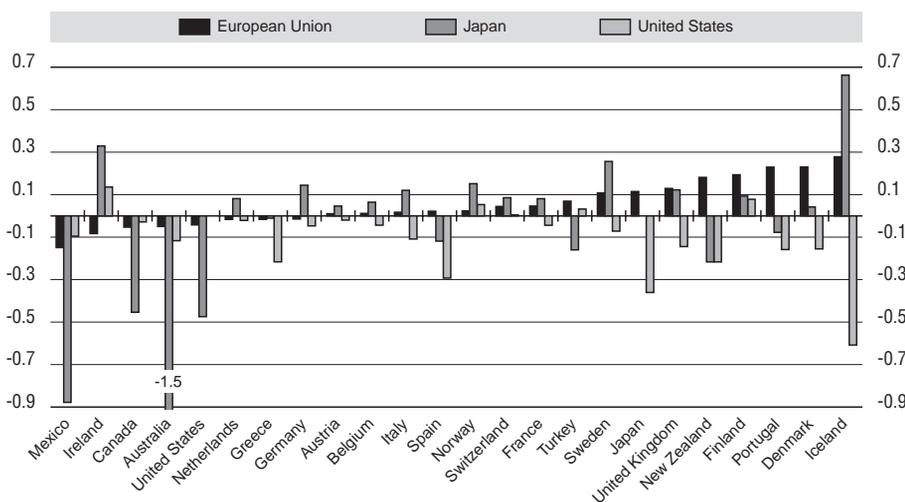
1. The box plot shows, for each country, the variation in the tariffs imposed on imports from partner countries. The median value of the tariff is depicted by the horizontal line in the box, the third and second quartiles of the cross-country distribution by the edges of each box, and the extreme values by the two whiskers extending from the box. Dots identify outlier observations.
  2. ISIC rev. 3 two-digit industry-level tariffs were aggregated to national level using the weights of the OECD import product mix.
  3. National levels represent a simple average of ISIC rev. 3 two-digit industry-level tariffs.
- Source: International Trade Center, Geneva and CEPII, Paris.

rates was indeed wide across OECD country pairs. This reflects tariff discrimination across trading partners, which may well contribute to explaining differences in bilateral trade intensities among OECD countries.<sup>13</sup>

Trade agreements tend to match and accentuate the gravity forces (see below) that affect bilateral trade among signatory countries.<sup>14</sup> The positive influence of free-trade areas on trade could be less pronounced for services, since non-border barriers may be more relevant for this kind of products. Suggestive evidence on the positive effects of regional agreements on bilateral goods trade flows among signatory countries is provided in Figure 12, which shows the change in geographical specialisation of exports to the European Union, the United States and Japan over the past two decades. With a few exceptions, EU countries have increased their specialisation towards the European Union, probably reflecting increasing market integration under the Single Market Programme.

In addition to influencing trade openness, tariff barriers can also affect bilateral FDI relationships. Vertical FDI aimed at re-importing to the home country or

Figure 12. **Changes in the geographical specialisation of goods exports to the European Union, Japan and the United States, 1990s vs. 1980s**<sup>1, 2</sup>



1. Geographical specialisation in goods trade is defined as the revealed tendency of a country to export a share of exports of its total exports to a partner country, which is larger than the share exported to that country by the OECD. For computational details, see Annex.
2. Change in the average value of the specialisation indicator in the two sub periods. A positive change implies an increase in geographical specialisation. Data are ranked on the European Union figures.

Source: OECD.

exporting to third-party countries the final or intermediate goods produced by foreign affiliates can be depressed by high bilateral tariffs between the host and investor country or between the host and third-party countries. On the other hand, high bilateral tariffs can generate so-called “tariff-jumping” behaviour by MNEs. Horizontal FDI that is prompted by tariff-jumping could be positively related to the level of tariffs in the host country. The same kind of relationship could *a fortiori* be expected between horizontal FDI and non-tariff barriers, since the latter often raise absolute barriers to market access (*e.g.* quantitative restrictions). Therefore, non-tariff barriers are likely to have a positive effect on FDI.

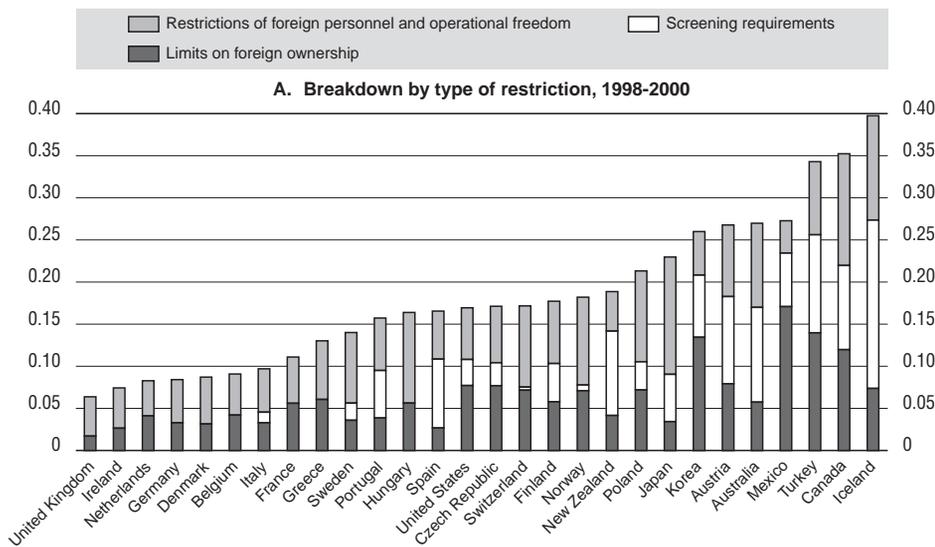
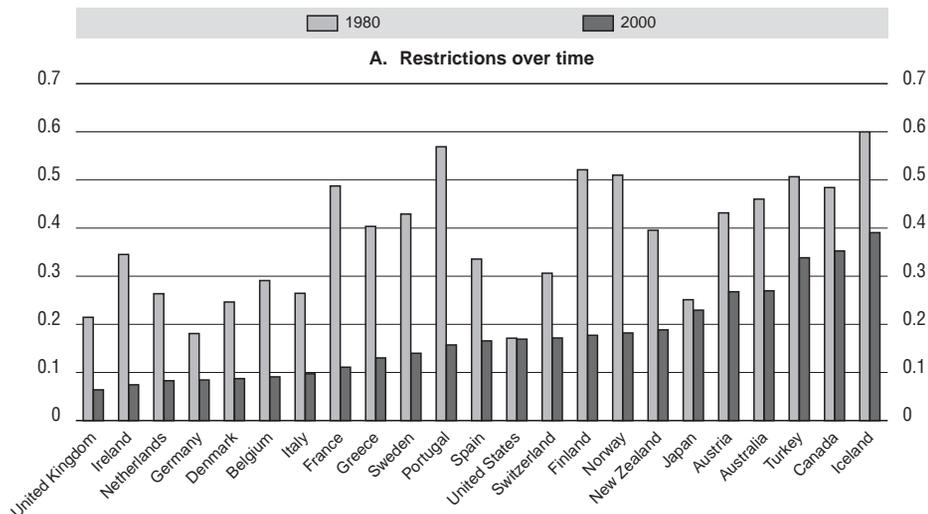
The effect of free-trade agreements on bilateral FDI transactions is more complex.<sup>15</sup> By substantially lowering trade costs among signatory countries, free-trade agreements make trade more advantageous than local production, tending to reduce horizontal FDI flows at any given level of fixed costs. However, by enlarging the overall size of the market in the free-trade area, these agreements also increase the scope for reaping firm-level economies of scale through horizontal FDI.<sup>16</sup> Moreover, the reduction in trade costs tends to increase vertical FDI flows that are aimed at re-exporting products into the home country or into other signatory countries. Furthermore, free-trade agreements tend to have a positive effect on horizontal FDI flows from non-signatory countries, because they enlarge the size of the market that they can access by producing locally at any given level of trade costs.<sup>17</sup> In conclusion, the effect of free-trade agreements on FDI flows among signatory countries is ambiguous, while it is presumably positive on FDI flowing from non-signatory countries. These effects are empirically tested in the next section.

### **FDI restrictions**

Although formal international agreements on FDI have been far less extensive than on international trade, global negotiations and regional free-trade agreements often cover some aspects of international investment as well (*e.g.* capital-market liberalisation within the European Union and provisions on commercial presence in the GATS), generally leading to lower barriers to FDI. Moreover, a number of bilateral investment treaties have been signed among OECD countries, aiming at curbing barriers to FDI. A new set of indicators of FDI restrictions was assembled by the OECD to summarise and quantify such barriers and their evolution over time. The indicators, which are described in detail in Golub (2003), cover mainly statutory barriers, ignoring most of the other direct or indirect obstacles impinging on FDI, such as those related to corporate governance mechanisms and/or hidden institutional or behavioural obstacles that discriminate against foreign firms.<sup>18</sup>

According to these indicators (Figure 13), liberalisation of FDI flows has been substantial over the past two decades in all OECD countries except the United

<sup>30</sup>

Figure 13. FDI restrictions in OECD countries,<sup>1</sup> 1980-2000

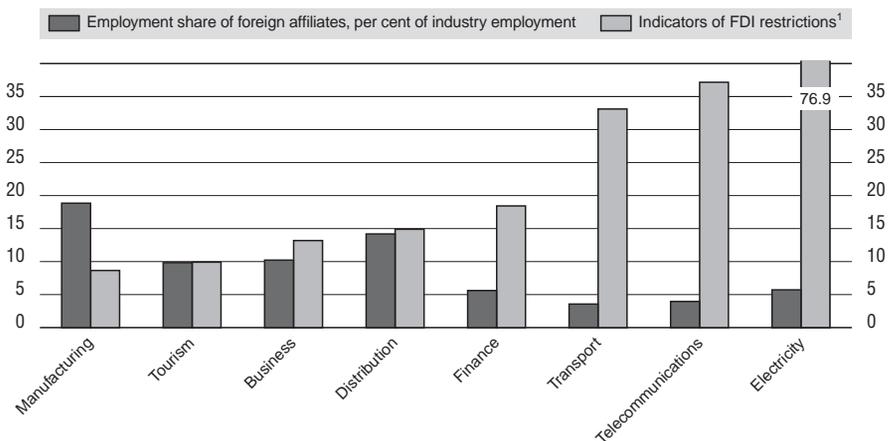
1. The indicator ranges from 0 (least restrictive) to 1 (most restrictive). The most recent year for which data are available varies across countries between 1998 and 2000.

Source: Golub (2003).

States and to a lesser extent Japan, both of which had relatively low statutory restrictions to begin with.<sup>19</sup> Despite the easing of restrictions and their generally much lower level at the end of the 1990s, cross-country differences remain significant, with most EU countries showing greater openness than the United States and Japan, and a few OECD countries maintaining a relatively restrictive approach (Iceland, Canada and Turkey). In most countries, restrictions on control of domestic firms by foreign residents (through either ceilings on foreign-owned equity or limitations on management and business choices) dominate those related to screening procedures (*e.g.* economic benefits or national interest tests).<sup>20</sup> On average, the bulk of restrictions are found in non-manufacturing industries.<sup>21</sup> FDI inflows into manufacturing are almost completely unrestricted, aside from economy-wide restrictions such as notification or screening requirements. Within non-manufacturing, electricity, transport and telecommunications are the most restricted industries, followed by finance, while the other service industries are on average relatively unrestricted.

Variable FDI restrictions across countries, industries and time are a natural candidate for explaining the dispersion observed in bilateral FDI transactions. These restrictions clearly raise barriers to foreign investment of MNEs and are likely to influence their choice among different investment locations. Some evidence of this is provided by Figure 14, which suggests that in very broad terms

Figure 14. **Foreign affiliates and FDI restrictions in the selected industries**  
OECD average



1. For this figure, the indicator ranges from 0 (least restrictive) to 100 (most restrictive).  
Source: Golub (2003) and OECD.

there is a weak but visible inverse relationship between the sectoral shares of employment in foreign affiliates and the level of FDI restrictions across a number of selected sectors.<sup>22</sup>

FDI restrictions may also be expected to influence bilateral trade much in the same way as tariff barriers are expected to influence bilateral FDI. By increasing the fixed costs of local production, they may make it *ceteris paribus* more profitable for horizontal MNEs to access local markets through exports. However, they also tend to decrease vertical FDI and the related export flows. Therefore, the aggregate effect on goods exports is ambiguous *a priori*. FDI restrictions represent an obstacle to services trade because they hinder service provision through commercial presence (through the establishment of foreign affiliates) and could also affect other modes of services trade because exports and commercial presence are complementary in certain industries, such as tourism.

### **Currency unions**

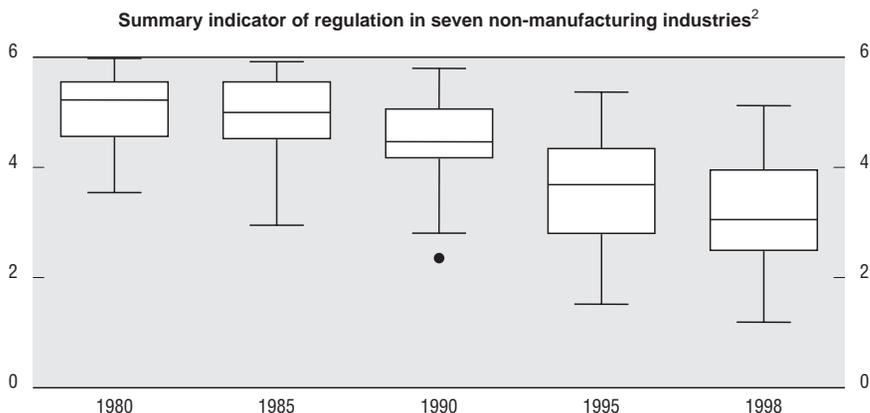
Exchange-rate variability may increase the transaction costs involved in trading goods and services and the risk premia on the returns to FDI. By eliminating those costs and reducing investment risk, currency unions can be expected to increase trade flows and expand FDI. Theoretical and empirical research has shown, however, that the impact of exchange-rate variability on trade is uncertain (for reviews, see McKenzie, 1999, and Taglioni, 2002), though recent evidence tends to find a positive effect of currency unions (Rose, 2000). At the same time, as suggested by Cushman (1985), the effects of reduced exchange-rate volatility on FDI depend on whether the firm sells its output in the host country or abroad, uses the host country or foreign inputs and finances its capital at home or abroad.<sup>23</sup> Therefore, the effect of exchange-rate variability on FDI is ultimately an empirical issue.

### **Product-market regulation**

Using a summary indicator of regulatory reform that ranks regulations in seven non-manufacturing industries from least to most restrictive of competition, Figure 15 suggests that OECD product markets have become increasingly open to competition over the past two decades. At the same time, the cross-country dispersion in regulatory approaches has increased, due to differences in initial conditions and/or in the scope and pace of reforms implemented by OECD countries. As a result, in 1998 (the last year for which cross-country regulatory data are available) regulations still differed substantially both at the economy-wide level and, especially, at the industry-level in several non-manufacturing industries.<sup>24</sup>

Product-market regulations can affect foreign trade and FDI in multiple and at times conflicting ways. Here, the focus is on regulations in the exporter (investor)

Figure 15. **Regulatory reform in OECD countries,<sup>1</sup> 1980-1998**  
 Summary indicator of regulation in seven non-manufacturing industries<sup>2</sup>



1. The box plot shows, in each year, the median OECD value of the regulatory indicator (the horizontal line in the box), the third and second quartiles of the cross-country distribution (the edges of each box) and the extreme values (the two whiskers extending from the box). Dots identify outlier observations.
  2. The indicator ranges from 0 (least restrictive) to 6 (most restrictive). It covers 25 OECD countries.
- Source: Nicoletti and Scarpetta (2003).

country or the importer (host) country that curb market forces where competition is viable and/or impose unnecessary costs on the firms involved in the bilateral trade (or investment) transaction.<sup>25</sup> Domestic regulation generally does not discriminate between local and foreign firms, but it may have distorting effects on bilateral trade and FDI flows by affecting the relative prices of different products (*e.g.* tradable *versus* non-tradable or home *versus* foreign) or the relative rates of return expected from investing in different locations.

A way in which relative prices can be affected is when the introduction of anti-competitive regulation in one country increases its production costs, for instance by discouraging efficiency enhancements and productivity growth. In the short run, this tends to make the products exported by this country less competitive in foreign markets. Conversely, cost-increasing regulation in the importer country may tend *ceteris paribus* to make the products supplied by the exporter country more competitive. With wage, price or exchange-rate rigidities, these effects may tend to carry over to the medium to long run. Moreover, cost-increasing regulations (which usually differ across industries) may also induce a reallocation of resources in both the exporter and importer countries, affecting their respective abilities to trade. Another way in which regulations can affect trade patterns is by

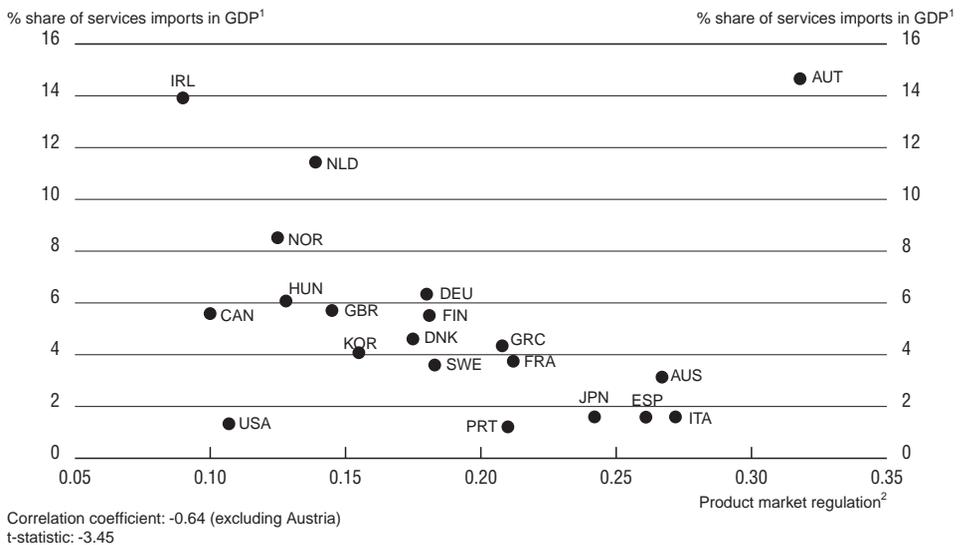
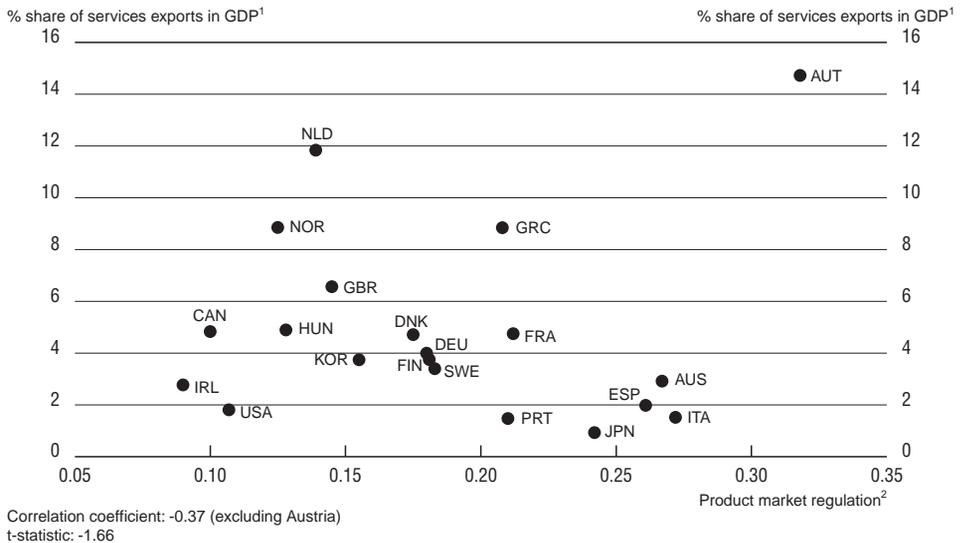
raising barriers to entry that reduce the number of suppliers, and hence the number of different goods offered, in an export market. This may have negative repercussions on intra-industry trade. Thus, strict product-market regulation in the foreign country potentially has conflicting influences on exports from the home country: on the one hand, it may stimulate exports through a competitiveness effect (at least in the short run); on the other hand, it may depress exports by limiting access to the foreign market.

A joint negative influence on bilateral trade can be exerted, in both the source and destination countries, by cost-increasing or barrier-raising regulations that affect industries in which inputs from both countries are needed to produce the traded product. This is the case, for instance, of many traded services – such as transportation, communications and business services – in which capital and labour from both the exporter and importer country are used to supply the service. In these situations, it is the combination of regulations in the countries involved in the transaction that is likely to affect trade flows.<sup>26</sup> Suggestive evidence of a negative correlation between anti-competitive services regulation and the intensity of services trade is provided in Figure 16, which plots the services export and import intensities of OECD countries against a summary indicator of regulation in non-manufacturing (which is increasing in restrictions to competition).<sup>27</sup>

Product-market regulations can also influence FDI by raising production costs or entry barriers, but their effect is more ambiguous:

- Cost-increasing regulations in the host country can deter FDI by lowering its expected rate of return if the foreign subsidiary is used as a platform for re-exporting final or intermediate goods back home or to other less regulated countries (the case of the vertical MNE). However, if FDI aims at accessing the local market (the case of the horizontal MNE), cost-increasing regulations in the host country may encourage FDI because the foreign affiliate can take advantage of the production structure of the parent firm, which may be more efficient than in local firms if regulations in the home country are more pro-competitive. Cost-increasing regulations in the home country may also stimulate outward FDI by favouring the delocalisation of production plants in countries with less costly regulations. On the other hand, the costs implied by these regulations may cripple the ability of home-country firms to internationalise production to the desired level.<sup>28</sup>
- Similar conflicting influences can be exerted by regulations that raise entry barriers in host countries. Such entry barriers clearly deter “greenfield” FDI aimed at establishing new firms or creating new production plants. However, by endowing local firms with market power, they can actually encourage inward FDI aimed at acquiring (or merging foreign parents with) existing local firms.

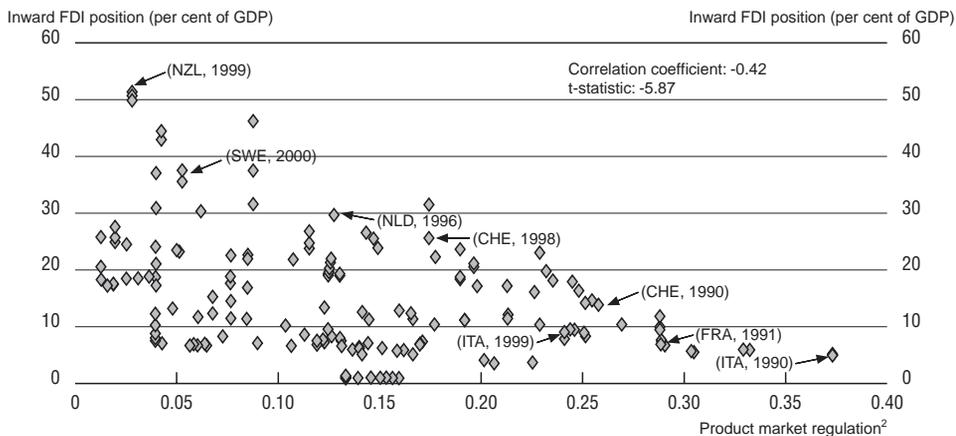
Figure 16. Non-manufacturing regulation and trade in services, 1998



1. The position of Austria reflects the exceptionally high share of service trade accounted for by tourism.

2. Weighted average of regulatory indicators in 12 non-manufacturing industries. 0-1 scale from least to most restrictive of competition.

Source: Nicoletti and Scarpetta (2003) and OECD.

Figure 17. Product market regulation and FDI, 1990-1998<sup>1</sup>

1. Each point shows the combination of regulation and FDI in a given country and period. Some of these country/period contributions are shown for illustrative purposes.
  2. Product of the indicator of economy-wide regulation in 1998 and the indicator of barriers to entry in seven non-manufacturing industries over the 1980-1998 period. 0-1 scale from least to most restrictive of competition.
- Source: Nicoletti and Scarpetta (2003) and OECD.

Despite the potentially conflicting linkages between regulation and FDI, *prima facie* evidence suggests that, on the whole, barriers to entry and cost-increasing regulations in the host country, as summarised by the product of the 1998 indicator of economy-wide regulation with the summary 1980-1998 indicator of barriers to entry in seven non-manufacturing industries, are inversely related with the intensity of inward FDI in OECD countries over the 1980-2000 period (Figure 17).

### Labour-market arrangements

A wide set of policies and institutions affect the functioning of the labour market impinging on trade or FDI transactions. In this study, the focus is restricted to employment protection legislation (EPL), collective bargaining mechanisms and labour income taxation, for which comparable cross-country data are available.<sup>29</sup> The OECD (1997c, 1999) has extensively documented cross-country differences in labour-market policies and institutions. Both employment protection and labour income taxation are driven by important policy objectives, but could also have side effects on the level and geographical allocation of trade and FDI.

The main channel through which EPL and labour tax wedges can affect trade and FDI is the influence they may have on the adaptability of labour markets and

on the cost of labour.<sup>30</sup> In the absence of offsetting mechanisms, EPL and labour taxes can affect trade and FDI patterns for largely the same reasons as cost-increasing product-market regulations do, *i.e.* by adversely affecting the relative prices of different products, or by adversely affecting relative returns from investing in the country that has stringent EPL or high wedges.<sup>31</sup>

However, the effects of EPL and labour income taxation on trade and FDI may also depend on the regime of industrial relations in place in each OECD country. Previous research has shown that some collective bargaining arrangements can provide an effective offsetting mechanism for the costs implied by labour income taxation and EPL. Specifically, regimes in which bargaining is done at the national (*i.e.* centralised) level and with a tight co-ordination among employers and unions operating in different industries may make it possible to shift the implicit costs of wedges and EPL onto wages, much in the same way as may happen in decentralised and uncoordinated labour markets, provided wage resistance is not encouraged through other arrangements (such as high income replacement rates in unemployment benefit systems).<sup>32</sup> Thus, to the extent that this offsetting mechanism is operating, effects of EPL or tax wedges on trade and FDI should be found mainly in situations in which bargaining is neither co-ordinated nor decentralised, as it is found for instance in countries where negotiations are implemented at the industry level.

The potential offsetting mechanism provided by certain bargaining institutions is likely to be effective for neutralising the adverse effects of high EPL and tax-related costs in the home country on the relative prices of tradable vs. non-tradable goods. Its offsetting effect on the tendency of international investors to divert investment towards locations in which risk-adjusted expected returns are relatively low is more doubtful. This is because strict EPL is likely to affect not only the returns expected from foreign investment (*e.g.* through effects on labour costs that can be offset by bargaining institutions) but also their variability (*e.g.* by influencing the capacity of foreign affiliates to respond to supply or demand shocks), thereby increasing the risk that investors face in the host country. Since MNEs can choose *ex ante* where to locate their investment, they may still tend to move where the risk/return ratio is lowest, independent of the features of bargaining institutions in potential host countries.<sup>33</sup> Similarly, the potential for shifting the costs implied by labour taxation onto wages may be limited in MNEs whose highly-skilled employees and managers are likely to be more mobile across borders than their homologues in local firms.

## Infrastructure

Trade and FDI may also be affected by factors that are, or have been, closely-related to government policies regarding transportation, communica-

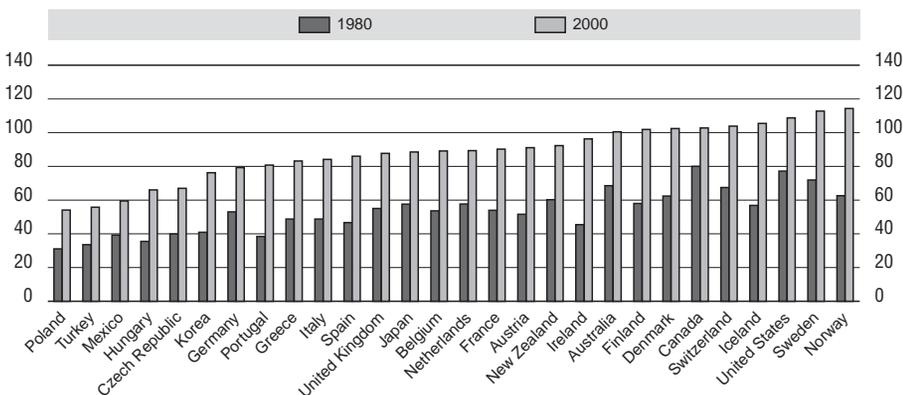
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<sup>38</sup>

tions and energy supply. Indeed, due to their public good and natural monopoly characteristics, some fixed network infrastructures are financed through public investment.<sup>34</sup> Figure 18 uses a new set of indicators to show the evolution of infrastructure endowments of OECD countries over the past two decades. The indicators are increasing in the quality and quantity of infrastructure and summarise information about transport, communication and energy supply infrastructure (Box 4). There have been substantial increases in infrastructure capital over the period in all OECD countries. By the year 2000, the Nordic countries, the United States, Canada, Australia and other small European countries, such as Switzerland and, to a lesser extent, Ireland had the highest levels of infrastructure. New OECD members and transition NScountries, such as Mexico, Turkey, Poland and to a lesser extent Hungary, the Czech Republic and Korea, were estimated to have relatively low levels of infrastructure.

The provision of infrastructure may affect comparative and absolute advantage and, therefore, cross-country patterns of trade and FDI (Findlay, 1996). Infrastructure is likely to be particularly important for trade in services, because the main items traded (travel, freight, communications, banking and business services) depend heavily on the existence of high capacity and efficient networks in

Figure 18. **Infrastructure endowments<sup>1</sup>**  
United States 1998 = 100



1. The indicator is the crossing of the quality and quantity of infrastructure in transport, telecommunications and electricity. It increases with infrastructure endowments and is expressed relative to the 1998 level of the indicator in the United States.

Source: OECD.

**Box 4. Infrastructure indicators**

The infrastructure indicator summarises, on a 0-1 scale, the quality and quantity of telecommunications, transport and electricity infrastructure. Items covered include mainlines per capita, mobile phones per capita, the share of digital lines in total lines, answer seizure ratios (*e.g.* the percentage of successful international phone calls) and fault rates (*e.g.* the percentage of faults repaired within 24 hours) in telecommunications; length of motorways per capita, length of paved roads per capita and aircraft departures per capita in transport; transmission losses, generating capacity per capita and reserve margins in electricity supply. The relevant data were drawn from the OECD, the European Conference of Ministry of Transportation, International Energy Agency and World Bank sources. Each sectoral indicator is a weighted average of the corresponding items. The overall infrastructure indicator is a weighted average of the three sectoral indicators. Weights assigned to items and sectors reflect judgements about the economic relevance of each component. A time-series of the indicator was calculated for the 1980-2000 period.

countries that are at both ends of the transaction. Thus, the combination of infrastructure conditions in the exporter and importer countries is likely to be relevant for services trade, much in the same way as for product-market regulation (see above). The availability and the quality of infrastructure may also positively affect inward FDI because good infrastructure lowers transactions costs, facilitating international specialisation and the location choices of footloose industries (Jones, 2000).<sup>35</sup> However, a possible complication is that FDI in infrastructure has increased in recent years. Thus, it is possible that countries with weaker infrastructure might attract FDI, implying a reverse relationship between FDI and infrastructure endowments.

**Geographical and economic factors**

As already mentioned, a number of factors unrelated to government policies can impinge on trade and FDI. Gravity factors are mainly related to market size and distance: the volume of transactions between two countries tends to increase as their incomes get larger, but decreases with the distance between them due to transport costs.<sup>36</sup> Total and relative market sizes are also important determinants of horizontal FDI, because the returns from such investment depend on economies of scale at the firm level (see Box 2). On the other hand, factor proportions are important because they determine each country's comparative advantage in trading goods and services, and also affect the extent to which vertical FDI is

implemented.<sup>37</sup> In general, geographical and economic factors are expected to affect trade and FDI in the following ways:

- Exports and outward FDI both tend to be positively affected by the combined market size of the countries involved in the transactions, due to both gravity effects and economies of scale.
- Exports and *horizontal* outward FDI also tend to be positively affected by the size similarity of the two countries. Size similarity stimulates intra-industry trade and favours firm-level economies of scale of horizontal MNEs, which have multiple production plants at home and abroad producing the same good (or service) (see Markusen, 2002).
- Exports tend to be negatively affected by distance and transport costs. However, their effects on FDI are unclear because they also imply transaction costs for investors, and these costs could offset any advantage that FDI may have over trade when dealing with distant and ill-connected countries.<sup>38</sup>
- Exports tend to be stimulated by differences in factor endowments of trading partners, because these make it possible to exploit comparative advantages. For broadly the same reason, dissimilarities in factor endowments also encourage vertical FDI. Conversely, horizontal FDI is discouraged by factor dissimilarities because they may make production of the same good in different countries difficult.

## EMPIRICAL EVIDENCE

This section presents evidence on the impact of policy and other factors on bilateral outward FDI positions (henceforth FDI outstocks), multilateral inward FDI positions (henceforth total FDI instocks), bilateral exports of goods and bilateral exports of services of OECD countries. Thus, the focus is on the determinants of exports or outward FDI from a country to its partners and the determinants of the global attractiveness of a country for international investors. For ease of exposition, only the results from “preferred” regression specifications are reported below (for detailed results, see Nicoletti *et al.*, 2003). It should be noted at the outset that, due to limitations in data coverage, the data sets on which the results are based vary across the dependent variables and the policies considered. FDI outstock and instocks as well as goods exports cover 28 OECD countries and partners over the 1980-2000 period at the bilateral and multilateral levels. However, a long enough time-series of total FDI instocks is only available for a smaller set of OECD countries. Bilateral exports of services cover 20 reporting countries and

27 partners over the 1999-2000 period. All trade and FDI variables are expressed in dollars at 1996 purchasing power parity values.<sup>39</sup>

## Approach

The estimated equations are reduced forms relating trade in goods, trade in services and FDI outstocks to broadly the same set of factors. This is in line with recent research that stresses the joint determination of trade and FDI transactions.<sup>40</sup> Bilateral exports and outward FDI from the home country to the partner country (henceforth partner for brevity) were related to i) geographic and non-policy-related structural factors, and ii) the relative costs of trading and investing implied by policies in the home country or partner. FDI regressions focus on bilateral outstocks and multilateral instocks; results for bilateral outflows are broadly the same.<sup>41</sup>

Thus, the building blocks of the estimated equations are *geographical and non-policy-related structural factors* including:

- *Variables expressing gravity forces*: total GDP (the sum of home country and partner GDPs in bilateral equations) proxying for total market size; an index of similarity of GDPs proxying for size similarity; distance (from capitals); and transport costs (computed as the difference between CIF imports in the partner and FOB exports by the home country).<sup>42</sup>
- *Variables expressing factor proportions*: dissimilarity in capital-labour ratios; and dissimilarity in human capital endowments (taking into account the share of population by different education levels and average years of schooling in each level).
- *Other economic variables likely to affect trade or FDI*: R&D intensity in the home country or partner, defined as the ratio of business R&D expenditure to GDP; bilateral exchange rates, defined as nominal exchange rates in bilateral equations and effective (import-weighted) nominal exchange rates in total instock equations; and exchange rate variability, defined as the standard error of the monthly exchange rates.<sup>43</sup>

As in the previous section, *policy factors* are grouped in four categories:

- *Openness*: multilateral and bilateral tariffs; multilateral indicators of non-tariff barriers; dummies for free-trade agreements (henceforth FTA); and the indicator of FDI restrictions described in Golub (2003).
- *Product-market regulation*: this covers two broad areas – protection of intellectual property rights (henceforth IPR) and regulations curbing competition. The former is proxied by the Ginarte and Park (1997) cross-section indicator of protection of IPR in 1997. Anti-competitive regulation is proxied in two different ways. FDI and trade in goods are related to a time-series indicator that combines barriers to entry in seven non-manufacturing industries over

the 1980-1998 period with economy-wide regulation in 1998. Trade in services is related to an indicator summarising barriers to entry in twelve non-manufacturing industries in 1998.

- *Labour-market arrangements*: the tax wedge on labour income; an indicator of employment protection legislation (EPL); and an indicator of the degree of centralisation and co-ordination of the bargaining regime. The latter two indicators are interacted to account for the possible influence of bargaining institutions on the costs implied by EPL (see above).
- *Infrastructure*: the indicator of infrastructure supply in transport, telecommunications and electricity.

All indicators are normalised and range from 0 to 100. The scale of all policy indicators is from least to most restrictive, except for the indicator of IPR which is increasing in the *lack of* protection. The infrastructure indicator is increasing in the quality and quantity of infrastructure. Details on all variables and indicators used in the regressions, including sources, definitions, methodologies, sensitivity analyses and a description of cross-country patterns are contained in Nicoletti *et al.* (2003).

The empirical estimates are based on panel regressions that take into account four different kinds of effects potentially unexplained by the above set of variables and indicators: *i*) time invariant effects that are specific to each home country and partner (*e.g.* institutions, data collection and reporting methods); *ii*) time invariant effects that are specific to each country pair involved in bilateral transactions (*e.g.* common language, cultural affinity); *iii*) time-varying factors common to all home countries and partners (*e.g.* global demand, supply or technology shocks); and *iv*) time-varying factors specific to each home country and partner (*e.g.* business cycle, country-specific technology shocks).<sup>44</sup> The econometric approach takes into account these factors either explicitly (by estimating the relevant parameters) or implicitly (by transforming the data prior to estimation) as in Erkel-Rousse and Mirza (2002).<sup>45</sup> In the analysis of bilateral trade or FDI, the observations are home country-partner pairs in each period; in the analysis of total FDI instocks observations are countries in each period. The analysis of total FDI instocks accounts for the possibility that the adjustment of actual to desired stocks of FDI is costly and takes time. Therefore, equations for total FDI instocks are of the dynamic partial adjustment kind, with the total FDI instock in each period also depending on the realised instock in the previous period (see Cheng and Kwan, 2000, for a similar specification). Moreover, the estimations also account for the possibility that some of the variables explaining FDI might be endogenous to outcomes (*e.g.* while the FDI instock may depend on infrastructure conditions in the country, infrastructure conditions themselves may depend on FDI in infrastructure) by using an appropriate instrumental variables estimation approach. Finally, the total instock equations also account for the possibility that investments in FTAs are the outcome of a two-stage

process in which, first, the decision is made to invest in the FTA, and, second, locations within the FTA are chosen based on the relative attractiveness of member countries.<sup>46</sup> Estimation methods are briefly summarised in Box 5.

All the results reported below are based on full-model specifications including both non-policy related variables and policy variables. However, the results are generally robust to the omission of subsets of policy variables. It is important to keep in mind that the results for the total FDI instock are based on a dynamic specification, which is significantly different from the static bilateral one, and covers a more limited set of countries.<sup>47</sup>

### **Non-policy-related structural factors impinging on trade and FDI**

Table 2 reports the estimates of the basic equations that include only non-policy-related structural factors. Four main features stand out:

- First, as expected, the coefficients of the gravity variables are correctly signed and significant in all equations. Thus, market size, market similarity, distance and transport costs affect in the same way FDI and exports of goods and services.<sup>48</sup>
- Second, the estimated effect of market size on trade in services and FDI is stronger than in goods trade, while the effect of transport costs (proxied by distance in the services trade equations) is smaller. While a smaller effect of transport costs on FDI is expected, because these should affect (indirectly) only vertical MNEs, the smaller effect on services is surprising, because such costs are often quoted as the reason for the lower intensity of trade in this sector. Thus, neither gravity nor transport cost factors seem able to explain the different trade intensities observed for goods and services.
- Third, the effects of differences in endowments of labour and physical or human capital vary across FDI, trade in goods and trade in services. Differences in endowments positively affect trade in goods, as would be expected from comparative advantage considerations. However, factor dissimilarities negatively affect outward FDI, though a high level of human capital tends to attract inward FDI. Taken together, the findings of a positive effect of market size similarity and a negative effect of factor dissimilarity support the conjecture that FDI by horizontal MNEs is prevalent among OECD countries. Finally, factor dissimilarities have no statistically significant impact on services trade. This finding may be interpreted as suggesting that the various kinds of services respond unevenly to those differences (*e.g.* while comparative advantage factors could sometimes be playing a positive role in tourism, similarity in endowments could be needed in financial or communication transactions).

### Box 5. Empirical methods

Regression results are obtained from single-equation estimation of reduced forms for bilateral FDI outstocks, goods exports and service exports as well as for total FDI instocks. To appropriately account for both the cross-section and time-series dimensions of the data, panel data estimation methods are used.

In bilateral equations, panel data methods require controlling for unobserved factors that are specific to each country, each partner, each country-partner pair and each period, as well as for shocks that are common to all countries over time. However, estimating dummies for all these factors is not viable, due to an excessive loss of degrees of freedom. Therefore, the “transformed least squares” (TLS) approach (Erkel-Rousse and Mirza, 2002) was employed, which simplifies the equation to be estimated while at the same time preserving the desirable properties of the relevant coefficient estimates. This approach expresses all variables as deviations from the mean investor (or exporter) or, alternatively, the mean host (or importer). Thus, for instance, two equations for bilateral FDI outstocks are obtained: a “country” equation, in which bilateral outstocks and all explanatory variables are expressed as deviations from their values for the average investor; and a “partner” equation, in which bilateral outstocks and all explanatory variables are expressed as deviations from their values for the average host. The advantage is that in the country equations partner-specific unobserved effects (and common time trends) are accounted for prior to estimation in a non-parametric way and only country-specific effects have to be estimated, while in the partner equations it is the country-specific unobserved effects (and common time trends) that are accounted for non-parametrically and the partner-specific effects that are estimated. This reduces the number of parameters to be estimated in each equation.\* The downside is that, due to the transformation of the data, no time-invariant partner-specific variables can be included in the country equations and, symmetrically, no time-invariant country-specific variables can be included in the partner equations. Finally, additional degrees of freedom are gained by assuming that, in each of the two equations, the incremental information provided by the unobserved country pair effect over the “pure” country or partner effect is random and can be included in the error term.

Total instock equations are estimated using a panel data procedure that controls for the possible inconsistency of estimates implied by the presence of the lagged dependent variable and the potential endogeneity of some of the explanatory variables (Bond, 2002). To this end, the equations are first-differenced, the lagged dependent variable and endogenous explanatory variables are instrumented by the lagged values of the variables themselves and the parameters are estimated applying a generalised method of moments procedure (Arellano and Bond, 1991). Serial correlation tests and Sargan tests for over-identifying restrictions were performed to ensure that the regression specifications reported in the main text were supported by the data.

\* To check the robustness of regression results to this transformation, each equation was also estimated using a standard fixed effects regression, including all unobserved effects save the country-partner pair effects.

Table 2. Non-policy-related structural factors impinging on trade and FDI

Dependent variable (ln)	Export of:				FDI		
	Goods		Services		Outstock		Total instock
Specification	Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Multilateral dynamic IV <sup>2</sup>
	Country	Partner	Country	Partner	Country	Partner	
Total GDP <sup>3</sup>	1.284 [14.95]**	0.78 [9.19]**	1.926 [11.49]**	1.677 [13.66]**	1.928 [4.89]**	1.903 [5.37]**	0.135 [2.02]*
Size similarity	0.627 [11.89]**	0.38 [7.47]**	0.948 [9.70]**	0.694 [9.22]**	1.436 [7.50]**	1.247 [7.22]**	
Factor dissimilarity	0.084 [2.64]**	0.046 [1.50]	0.386 [1.41]	0.032 [0.30]	-0.199 [3.18]**	-0.43 [7.05]**	
Human capital dissimilarity	0.415 [2.63]**	0.338 [2.51]*	-0.177 [0.29]	0.66 [1.19]	-2.122 [9.43]**	-2.153 [10.28]**	
Human capital endowment							1.873 [4.38]**
Transport costs	-0.813 [18.02]**	-0.792 [18.64]**			-0.722 [5.95]**	-0.506 [3.86]**	
Distance	-1.106 [27.74]**	-1.126 [30.63]**	-0.843 [10.47]**	-0.762 [10.34]**			
R&D intensity	0.107 [3.79]**						0.36 [5.42]**
Bilateral exchange rate	-0.583 [11.14]**	-0.237 [4.40]**			0.637 [3.78]**	-0.701 [4.34]**	
Effective exchange rate							0.005 [4.70]**
Exchange rate variability <sup>4</sup>					-0.003 [1.94]	-0.002 [1.65]	
Lagged dependent variable							0.688 [17.11]**
Constant	1.92 [9.58]**	0.96 [5.92]**	-0.60 [4.94]**	-0.10 [0.98]	-2.13 [4.31]**	-1.06 [2.76]**	0.00 [0.34]

Table 2. **Non-policy-related structural factors impinging on trade and FDI** (*cont.*)

Dependent variable (ln)	Export of:				FDI		
	Goods		Services		Outstock		Total instock
Specification	Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Multilateral dynamic IV <sup>2</sup>
	Country	Partner	Country	Partner	Country	Partner	
Notes:	28 countries and partners		17 countries, 26 partners		28 countries and partners		19 countries
Period	1980-2000		1999-2000		1980-2000		1980-2000
Observations <sup>5</sup>	7 780	7 768	540	534	4 521	4 517	174
R-squared <sup>6</sup>	n.a.	n.a.	n.a.	n.a.	0.72	0.65	n.a.
Country effects	Yes	Implicit	Yes	Implicit	Yes	Implicit	Yes
Partner effects	Implicit	Yes	Implicit	Yes	Implicit	Yes	
Common time trend	Implicit	Implicit	Implicit	Implicit	Implicit	Implicit	
Country-specific trend	Yes	Implicit	n.a.	n.a.	Yes	Implicit	
Partner-specific trend	Implicit	Yes	n.a.	n.a.	Implicit	Yes	
Bilateral effect	Random	Random	Random	Random	Fixed	Fixed	
Sargan test <sup>7</sup>							224 (340)
Autocorrelation in first-differenced residuals							
First-order <sup>8</sup>							-3.940
Second-order <sup>8</sup>							-2.160

Absolute value of t or z-statistics in brackets. \* significant at 5% level; \*\* significant at 1% level; n.a. = not applicable.

- Equations estimated using the Transformed Least Squares (TLS) approach (Erkel-Rousse and Mirza, 2002). "Country" indicates the use of data expressed as deviations from the mean host that allows for estimation of investor-specific variables, "partner" indicates the use of data expressed as deviations from the mean investor that allows for estimation of host-specific variables.
- The dynamic panel specification was estimated using the Arellano and Bond (1991) generalized method of moments estimator.
- Defined as domestic absorption in the total instock regressions.
- Coefficients multiplied by 100.
- Samples are adjusted for outliers based on the Welsch distance cut-off (Chatterjee and Hadi, 1988).
- The R-squared is reported only in fixed effects regressions.
- The Sargan statistic tests the null hypothesis that all moment conditions are satisfied. The statistic is  $\chi^2$ -distributed with degrees of freedom in parenthesis.
- These tests check the assumption that residuals are serially uncorrelated. This assumption implies that their first differences follow an MA(1) process having non-zero first-order correlation but no higher-order correlation. Reported statistics, both distributed  $N(0,1)$ , test the null hypothesis of zero first-order and second-order autocorrelation, respectively.

Source: OECD.

- Fourth, the sizeable coefficient estimate for the lagged FDI instock in the dynamic total instock regressions suggests that there is a high persistence present in the data, with FDI flowing to countries that already have relatively high bilateral instocks. This phenomenon may reflect the presence of “agglomeration effects”, whereby FDI is attracted to locations in which important investments by home country MNEs have already been made (see, for related evidence, Barrell and Pain, 1998 and 1999).<sup>49</sup>

R&D intensity in the home and partner countries and the level and volatility of bilateral and effective exchange rates have the expected influence on trade and FDI. R&D in the home country is a common proxy for product differentiation, which positively affects intra-industry trade. At the same time, the overall level of R&D expenditure in the host country increases its attractiveness for total inward FDI. For given relative prices (whose effect is captured by relative factor endowments and, in later regressions, by the product and labour-market regulation variables), an exchange rate appreciation curbs the competitiveness of home country exports of goods, as pointed out by the negative and significant estimates of its coefficient in bilateral export equations. However, it has two opposing effects on FDI. On the one hand, it reflects a pure valuation effect, with the US\$ value of assets held by the home country in the host country decreasing; on the other hand, it reflects an asset effect, increasing the attractiveness of investment in the host country, as its assets become cheaper for foreigners. The results are ambiguous. The estimated effects change sign across bilateral FDI specifications, though the valuation effect seems to prevail in most regressions (see Nicoletti *et al*, 2003). At the multilateral level (as captured by the dynamic total instock regressions), the asset effect seems to prevail, perhaps due to composition effects.<sup>50</sup> The effects of exchange rate variability are discussed below.

### The direct and indirect influence of policies

Table 3 reports the results of regressions that include policy variables. The reported specifications generally include all of them. However, some policy variables are sometimes omitted when the inclusion of all variables would imply either significant changes in country coverage (such as in the total instock equations) or excessive multicollinearity (such as in the cross-section services trade regressions). Most of the variables are expressed in ratios, but country or partner-specific policy variables in trade equations are expressed in level terms in line with trade literature (*e.g.* Helpman and Krugman, 1995). To highlight similarities and differences in the way policies may influence trade in goods, trade in services and bilateral or multilateral FDI, it is useful to look at the estimated effects of each policy across the different measures of trade and FDI. Therefore, the effects of each of the four sets of policies covered in this paper are analysed in turn under the usual headings.

## Openness

FDI restrictions by the partner are estimated to have a significant negative impact on bilateral FDI outstocks (Table 3, Panel A). For instance, the semi-elasticity estimates imply that such barriers could be depressing FDI outstocks by between 10 and 80 per cent, depending on the restriction considered (see Table 4).<sup>51</sup> FDI restrictions are also found to significantly depress the inward position of a host country in the dynamic total instock regressions, which are based on a smaller set of OECD countries. However, this effect appears to be sensitive to changes in the country coverage, probably due to a relative lack of variability of restrictions across subsets of OECD countries, and to the inclusion of additional policy variables in the regression, reflecting the close correlation between FDI and product-market liberalisation over the sample period.

Similarly, border barriers directly affect trade in goods (Table 3, Panel B). Applied bilateral tariff rates have a significant negative effect on exports, with the estimated elasticities implying around 1 per cent increase in exports as tariffs decline by 1 percentage point. Moreover, the estimates suggest that a decrease by 1 percentage point of the import coverage of (multilateral) non-tariff barriers in the partner may also increase bilateral exports of the home country by around 1 per cent. These results should be interpreted with caution because, due to data limitations, both the tariff and non-tariff measures are not fully appropriate: applied bilateral tariffs are available for only one recent year, and cover therefore only the cross-section dimension, while the available non-tariff measures are multilateral, and therefore do not accurately account for the influence of border barriers on bilateral trade.<sup>52</sup>

Table 3 also reports estimates of the potential cross-effects of border barriers on trade and FDI. To this end, tariff and non-tariff barriers were included in the FDI equations (to test for the tariff-jumping hypothesis) and, conversely, FDI restrictions were included in the trade equations. Estimation results for bilateral FDI outstocks and, especially, total instock equations provide some evidence that FDI may be aimed at bypassing non-tariff barriers, which often establish limits to market access (*e.g.* quotas), rather than tariff barriers, which generally add to the cost of trade without necessarily foreclosing exports. Indeed, tariff barriers appear to have a negative effect on FDI outstocks, perhaps reflecting their discouraging effect on the intra-firm trade related to vertical FDI. Some evidence of cross-effects is also found in services trade equations, with FDI restrictions negatively affecting trade in some regressions, perhaps reflecting the complementarity between commercial presence and consumption abroad or cross-border supply for some services (*e.g.* tourism). Cross effects are not found for exports of goods, suggesting that goods trade is not frequently resorted to as a means of bypassing FDI restrictions.

As regards FTAs, the empirical analysis considered the impact of different situations of the home and partner countries: *i*) the two countries belong to *any* FTA;

Table 3.a. The influence of policies on foreign trade and investment

Dependent variable (ln)	FDI				
	Outstock		Total instock		
Specification	Bilateral TLS <sup>1</sup>		Multilateral Dynamic IV <sup>2</sup>		
	Country	Partner			
Total GDP <sup>3</sup>	3.342 [8.39]**	1.328 [3.78]**	0.283 [3.76]**	0.389 [5.01]**	0.363 [4.56]**
Size similarity	2.187 [11.43]**	0.968 [5.64]**			
Factor dissimilarity	-0.059 [0.63]	-0.794 [6.90]**			
Human capital dissimilarity	-0.844 [3.57]**	-1.383 [6.08]**			
Human capital endowment			1.248 [2.83]**	0.658 [1.42]	1.219 [2.67]**
Transport costs	-0.662 [5.39]**	-0.743 [6.14]**			
R&D intensity			0.323 [4.93]**	0.403 [5.71]**	0.485 [6.66]**
Bilateral exchange rate	0.283 [1.61]	-0.97 [5.70]**			
Effective exchange rate			0.004 [4.15]**	0.003 [3.33]**	0.004 [3.70]**
Exchange rate variability <sup>4</sup>	0.024 [5.45]**	-0.0001 [1.23]	-0.008 [1.33]	-0.008 [1.47]	-0.011 [1.80]
Lagged dependent variable			0.626 [15.19]**	0.558 [12.42]**	0.519 [10.98]**
Free trade area	0.366 [5.22]**	0.482 [5.84]**			
FDI restrictions		-0.019 [3.06]**	-0.007 [2.62]**	-0.002 [0.50]	0.006 [1.58]
Bilateral tariff barriers	-0.1 [6.08]**	-0.059 [4.07]**			
Non-tariff barriers		0.011 [1.89]	0.112 [3.55]**	0.143 [4.44]**	0.166 [4.89]**
Employment protection ratio <sup>9</sup>	-0.032 [2.62]**	-0.053 [5.37]**		-0.007 [2.91]**	-0.007 [2.46]**
Labour tax wedge ratio <sup>9</sup>	-0.925 [9.20]**	-2.297 [11.65]**		-0.005 [1.10]	-0.008 [1.75]
Regulation ratio <sup>9</sup>	-0.142 [8.25]**	-0.1 [6.11]**		-0.006 [1.53]	-0.010 [2.53]**
Infrastructure			0.008 [2.12]**	0.013 [2.92]**	0.006 [1.35]
Constant	-0.87 [1.75]	-3.29 [7.97]**	-0.008 [1.07]	-0.007 [0.88]	0.009 [1.04]

Table 3.a. The influence of policies on foreign trade and investment (cont.)

Dependent variable (ln)	FDI				
	Outstock		Total instock		
Specification	Bilateral TLS <sup>1</sup>		Multilateral Dynamic IV <sup>2</sup>		
	Country	Partner			
Notes:	28 countries and partners		16 countries	14 countries	10 countries
Period	1980-2000		1980-2000		
Observations <sup>3</sup>	3 792	3 601	169	163	134
R-squared <sup>6</sup>	0.71	0.72	n.a.	n.a.	n.a.
Sargan test <sup>7</sup>			223 (340)	205 (693)	151 (338)
Autocorrelation in first-differenced residuals					
First-order <sup>8</sup>			-3.45	-3.30	-3.30
Second-order <sup>8</sup>			-1.93	-1.94	-1.73

Absolute value of t or z-statistics in brackets. \* significant at 5% level; \*\* significant at 1% level.

n.a. = not applicable.

Country, partner, bilateral and time effects as in Table 2.

Notes 1-8 as in Table 2.

9. The ratio increases as employment protection, regulation or the labour tax wedge become more restrictive in the host country.

Source: OECD.

ii) the partner belongs to *any* FTA; iii) the two countries belong to the *same* FTA; iv) the two countries belong to the EU, NAFTA or EFTA; and v) the partner (but not the home country) belongs to the EU, NAFTA or EFTA. Only results concerning the latter three situations and, for services trade regressions, membership in the EU or NAFTA are reported, since the dummies for membership of both countries or the partner in any FTA were insignificant in most cases. The analysis of situations iv) and v) omitted policy variables unrelated to openness to avoid multicollinearity problems, but the results are broadly unchanged in specifications including all policy variables. The three main findings were:

1. Membership in the *same* FTA increases both exports of goods and FDI outstocks (Table 3);
2. Bilateral exports of goods and outward FDI to partners belonging to a different FTA tend to increase only when the partner is a EU country (Table 5);
3. The effect of FTA membership on exports of services is insignificant. In particular, close integration under the Single Market Programme does not appear to have boosted services trade among EU countries (Table 5).

Thus, FTAs that eliminate border barriers appear to be unsuccessful in raising services trade, perhaps because the latter is often impeded by non-border barriers.

Table 3.6. The influence of policies on foreign trade and investment

Dependent variable (ln)	Export of						
	Goods		Services				
Specification	Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>
	Country	Partner	Country	Partner	Country	Partner	Partner
Total GDP	1.006 [11.15]**	0.747 [8.77]**	1.759 [29.53]**	1.614 [31.88]**	1.569 [27.51]**	1.464 [27.22]**	1.623 [11.31]**
Size similarity	0.539 [9.52]**	0.44 [8.19]**	0.897 [13.31]**	0.676 [11.94]**	0.803 [13.41]**	0.571 [9.97]**	0.659 [7.80]**
Factor dissimilarity	0.153 [3.87]**	0.112 [2.72]**	0.26 [1.93]	0.193 [1.67]	0.137 [0.97]	0.198 [1.36]	0.099 [0.92]
Human capital dissimilarity	0.54 [2.80]**	0.46 [2.69]**	-0.788 [2.24]*	-0.852 [2.21]*	-0.415 [1.08]	0.31 [0.70]	0.729 [1.25]
Distance	-0.972 [18.18]**	-0.991 [20.63]**	-0.928 [19.44]**	-0.806 [18.81]**	-0.895 [23.42]**	-0.795 [19.36]**	-0.751 [7.43]**
Transport costs	-0.71 [11.37]**	-0.683 [11.75]**					
R&D intensity	0.208 [7.89]**						
Bilateral exchange rate	-0.489 [8.33]**	-0.285 [5.53]**					
Free trade area	0.109 [4.77]**	0.134 [4.96]**					-0.02 [0.07]
FDI restrictions		-0.039 [0.84]					-0.399 [3.03]**
Bilateral tariff barriers	-0.137 [3.69]**	-0.145 [4.08]**					
Non-tariff barriers		-0.08 [4.23]**					
<i>Country or partner-specific policy variables</i>							
Regulation	-0.253 [3.85]**	-0.118 [2.06]*					
Labour tax wedge	-0.399 [5.54]**	0.194 [2.94]**	-0.608 [3.83]**	-0.726 [4.70]**			

Table 3.6. The influence of policies on foreign trade and investment (cont.)

Dependent variable (ln)	Export of						
	Goods		Services				
Specification	Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>
	Country	Partner	Country	Partner	Country	Partner	Partner
Employment protection					-0.011 [4.85]**	-0.022 [8.10]**	
With high-level corporatism	0.002 [1.85]	0.001 [0.92]			0.034 [4.34]**	0.01 [1.86]	
With mid-level corporatism	-0.003 [2.52]*	-0.002 [1.43]			-0.011 [1.47]	-0.003 [0.32]	
With low-level corporatism	0.001 [0.60]	-0.001 [0.80]					
<i>Combined country/partner policy variables</i>							
Regulation <sup>7</sup>			-0.258 [2.57]*	-0.241 [2.26]*	-0.236 [2.18]*	-0.258 [2.18]*	
Transport infrastructure <sup>7</sup>			0.212 [2.39]*	0.365 [5.70]**			
Constant	1.50 [6.20]**	1.21 [6.98]**	-0.63 [10.39]**	-0.06 [1.57]	-0.53 [11.02]**	0.09 [1.88]	-0.11 [1.06]
Notes:	28 countries and partners		17 countries and 26 partners				
Period	1980-2000		1999-2000				
Observations <sup>5</sup>	6 107	6 119	480	477	435	432	519
R-squared <sup>6</sup>	n.a.	n.a.	0.79	0.76	0.79	0.76	n.a.

Absolute value of t-statistics in brackets. \* significant at 5% level; \*\* significant at 1% level; n.a. = not applicable.

Country, partner, bilateral and time effects as in Table 2.

Notes 1, 5 and 6 as in Table 2.

7. Product of indicators in home and host countries.

Source: OECD.

Table 4. **FDI positions: the hypothetical effect of removing FDI restrictions<sup>1</sup>**  
Average across countries

	Per cent change in inward FDI position
Removal of foreign equity ceilings	77.9
Removal of approval and national interest tests	21.2
Easing of nationality requirements on management <sup>2</sup>	10.1

1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.

2. From majority of domestic managers to only one or more domestic managers.

Source: OECD.

Moreover, FTAs appear to benefit principally goods trade among their members, but have little impact on trade with third-party countries (independent of their membership in another FTA), except when trading with a EU member. While FTAs also benefit FDI among their members, FDI outstocks are stimulated as well when the partner belongs to the European Union, though this effect is only weakly significant. In other words, the European Union appears to be more attractive for third-party FDI and exports than other FTAs, such as NAFTA. This may be related to lower average tariffs, closer integration (*i.e.* a custom union *versus* a free-trade area) in the Single Market and/or the different role played by rules of origin in the two areas.<sup>53</sup>

Exchange rate variability can be interpreted as capturing the effect of economic unions to the extent that these generally require stable exchange rate arrangements or a single currency. In most regressions, a reduction of both bilateral and multilateral exchange rate volatility tends to increase FDI in the host country. Though this effect is not significant at conventional levels in the regressions reported in Tables 3 and 5, it is significant in other bilateral and multilateral specifications of the FDI outstock and outflow equations (see Nicoletti *et al.*, 2003). In some specifications, however, the sign is reversed, suggesting a positive relationship between exchange rate volatility and FDI, and no effects of volatility could be found on goods or services exports (the variable was therefore omitted from the preferred bilateral trade specifications reported in the tables). Whether currency unions stimulate economic integration among their members remains, therefore, a largely unresolved empirical issue.

### **Product-market regulation**

Product-market regulations that curb competition are estimated to have a negative and significant effect on both trade and FDI (Table 3). However, the results suggest that they do so in different ways for FDI, trade in goods and trade

in services. What is relevant for bilateral FDI outstocks is the ratio of the regulatory indicators in the host and home countries. As regulation in the host country becomes more restrictive than regulation in the home country, outstocks of the latter decrease. This is confirmed by the significantly negative impact of anti-competitive regulations in the host country (relative to the OECD average) on its total FDI instock.<sup>54</sup> Put simply, the net effect of regulations that curb competition is to make the host country less attractive for international investors located in countries where regulations are less restrictive. No robust effect of the lack of intellectual property rights protection in the host country could be found on FDI outstocks, perhaps due to the crude proxy used to test for this potential effect of policies, which varies only in the cross-section dimension.<sup>55</sup> Hence, this variable was omitted from the preferred specifications reported in Table 3.

Conversely, what is most relevant for bilateral exports of goods is the level of regulation in the home country, which increases production costs, curbing the competitiveness of exports, distorts relative prices and possibly reduces also opportunities for intra-industry trade by narrowing product variety. To a lesser extent, regulations in the partner countries also tend to depress exports, suggesting that their effect on market access dominates the possible stimulating effect on the competitiveness of foreign *versus* home goods.

Finally, estimation results point to an identical effect of regulations in the home and the partner country on bilateral services exports. In other words, statistical tests suggest that it is the *product* of the regulatory indicators in the two countries that has a negative and significant effect on services trade. This probably reflects the need for using efficiently inputs in both countries to produce many of the services that are traded (*e.g.* travel, freight, tourism, communication, banking). Moreover, regulation is estimated to have a stronger impact on services trade, as measured by the size of the estimated coefficient, than on both goods trade and FDI. The fact that anti-competitive regulations are generally more widespread in services, that these regulations combine in both the exporter and importer countries to lower service exports and that their combined impact is stronger than in goods trade, could contribute to explain not only cross-country patterns of services trade but also observed differences in trade intensities of goods and services.

### **Labour-market arrangements**

The tax wedge on labour income appears to influence FDI in much the same way as anti-competitive regulation. What appears to be relevant for bilateral FDI outstocks is the ratio between wedges in the partner and the home country: the higher this ratio, the lower the outstock of FDI from the home country to the partner. This latter result is only partially confirmed by the dynamic total instock estimates, in which the wedge is estimated to have a negative, but weakly significant,

Table 5. The influence of free-trade agreements

Dependent variable (ln)	FDI		Exports of			
	Outstock		Goods		Services	
Specification	Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>	
	Country	Partner	Country	Partner	Country	Partner
Total GDP	1.89 [4.86]**	1.918 [5.42]**	1.33 [14.59]**	0.662 [7.74]**	1.999 [14.57]**	1.692 [18.21]**
Size similarity	1.414 [7.51]**	1.255 [7.25]**	0.702 [12.94]**	0.369 [6.98]**	0.981 [12.20]**	0.71 [9.57]**
Factor dissimilarity	-0.176 [2.79]**	-0.395 [6.41]**	0.164 [4.36]**	0.12 [3.27]**	0.444 [1.60]	0.259 [2.78]**
Human capital dissimilarity	-1.906 [8.56]**	-1.934 [9.34]**	0.216 [1.26]	0.093 [0.62]	-0.152 [0.23]	0.571 [0.98]
Transport costs	-0.693 [5.75]**	-0.479 [3.74]**	-0.749 [13.74]**	-0.72 [14.16]**		
Distance			-1.042 [20.97]**	-1.058 [22.14]**	-0.844 [7.44]**	-0.73 [6.84]**
R&D intensity			0.119 [4.12]**			
Bilateral exchange rate	0.711 [4.26]**	-0.718 [4.47]**	-0.58 [10.20]**	-0.346 [6.39]**		
Exchange rate variability <sup>4</sup>	-0.003 [1.50]	-0.002 [1.26]				
FDI restrictions				-0.107 [2.33]*		-0.139 [1.00]
Bilateral tariff barriers			-0.097 [2.31]*	-0.105 [2.69]**		
Non-tariff barriers				-0.074 [3.78]**		
Infrastructure					0.355 [1.59]	0.381 [3.19]**
European Union	0.529 [7.73]**	0.808 [3.89]**	0.058 [1.85]	0.163 [3.34]**	0.194 [0.83]	0.26 [0.74]
NAFTA	1.578 [7.37]**	1.754 [7.69]**	0.485 [2.43]*	0.495 [3.58]**	-0.367 [1.21]	-0.508 [1.54]
EFTA	0.466 [2.53]*	0.5 [1.49]	0.183 [3.12]**	0.239 [3.12]**		
<i>Partner in:</i>						
European Union		0.376 [1.79]		0.144 [3.16]**		
NAFTA		-0.048 [0.27]		0.033 [0.64]		
EFTA		0.264 [0.98]		0.027 [0.46]		
Constant	-2.21 [4.53]**	-0.85 [2.05]*	2.08 [9.94]**	0.82 [4.76]**	-0.70 [4.65]**	-0.09 [1.31]

Table 5. The influence of free-trade agreements (cont.)

Dependent variable (ln)	FDI		Exports of			
	Outstock		Goods		Services	
Specification	Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>		Bilateral TLS <sup>1</sup>	
	Country	Partner	Country	Partner	Country	Partner
Notes:	28 countries and partners		28 countries and partners		17 countries and 26 partners	
Period	1980-2000		1980-2000		1999-2000	
Observations <sup>5</sup>	4 521	4 517	6 958	6 945	525	519
R-squared <sup>6</sup>	0.73	0.66	n.a.	n.a.	n.a.	n.a.

Absolute value of t or z-statistics in brackets. \* significant at 5% level; \*\* significant at 1% level; n.a. = not applicable. Country, partner, bilateral and time effects as in Table 2.

For notes 1, 4, 5 and 6: see Table 2.

Source: OECD.

impact on the ability of the host country to attract OECD-wide FDI. As with product-market regulation, bilateral exports of goods are significantly depressed by a high tax wedge in the home country, suggesting that its impact on production costs is not fully offset by wages. In this case, however, a symmetric (though weaker) reverse effect is found for a high tax wedge in the partner, which *ceteris paribus* raises the competitiveness of the home country exports. Finally, high tax wedges in both the home country and the partner are estimated to have depressing effects on bilateral service exports, confirming that traded services may use labour inputs in both countries involved in the transaction.<sup>56</sup>

Results for EPL are similar but more nuanced, because some of them depend on the bargaining regime in place in the home country and the partner. The effect of EPL on bilateral FDI outstocks and total FDI instocks mirrors that of anti-competitive regulations and wedges: host countries in which EPL is stricter than in their investing partners tend to attract significantly less FDI. Here, the bargaining regime plays no moderating role, perhaps due to the influence of EPL regimes on the risk-adjusted returns to foreign investment or differential information costs for domestic and foreign investors (see above). On the other hand, strict EPL in the home country depresses goods exports by increasing production costs, thus curbing the competitiveness of exported goods, and distorting relative prices, but only in countries where industry-level bargaining (labelled “mid-level corporatism” in Table 3) discourages the shift of those costs to wages. At the same time, no effect of strict EPL in the partner is found, independent of the level of corporatism.

Finally, in services trade strict EPL in the home country and the partner both have a negative effect on exports, further confirming the pattern already observed for regulation and wedges. However, this effect vanishes in highly corporatist home countries.

### **Infrastructure**

Table 3 looks only at the influence of infrastructure provision on FDI and trade in services, because the role of infrastructure for trade in goods is indirectly captured by transport costs and, therefore, is not modelled explicitly.<sup>57</sup> Even though the coefficient estimated for infrastructure has the expected sign, the estimation results provide little evidence that the quality and quantity of infrastructure in the partner, as captured by the indicator described in the previous section, significantly affects bilateral patterns of FDI. Therefore, this variable was omitted from the “preferred” specifications reported in Table 3. The lack of any definite result for this variable may also be related to its potential endogeneity to FDI (see above). Indeed, total instock regressions, which control for endogeneity through instrumental variable estimation, suggest that infrastructure tends to improve the overall attractiveness of a host country for international investors, though this result is sensitive to changes in country coverage.<sup>58</sup> Moreover, transport infrastructure is estimated to have a sizeable and significant positive effect on trade in services. Here, infrastructure in both the country and partner is relevant for trade and, therefore, transport infrastructure is defined as the product of the indicator values in the two countries.<sup>59</sup> The results suggest that the elasticity of bilateral service exports with respect to transport infrastructure provides a significant offset to the negative effect of distance. Poor or inefficient infrastructure is therefore a supplementary explanation of both cross-country services trade patterns and the relatively low trade intensity observed in the service sector.

### **Summing up**

Empirical results broadly support the influences expected from both non-policy related and policy factors on trade and FDI. The main insights are the following:

- Gravity forces affect trade and FDI in the same way. However, the effect of market size and transport costs on FDI and trade in services is, respectively, stronger and weaker than in goods trade. Thus, economic and geographic considerations alone are unable to explain the significant difference in the intensity of trade in goods and services.
- Border barriers have a direct depressing effect on both trade and FDI, but there is also evidence that MNEs may be able to bypass non-tariff barriers, which limit the access of exporters to local markets, by increasing the activity of their foreign affiliates in these markets. Conversely, no such bypass

seems to occur for tariff barriers, which raise the cost of trade for both exporters and vertical MNEs.

- Participation in a FTA enhances trade and FDI amongst its members, but the only FTA that appears to have benefited also from an increase in trade and FDI from third parties is the European Union, perhaps due to its closer degree of integration. Moreover, FTAs do not appear to have affected positively services trade among their members, which might be due to limited coverage of the agreements and remaining non-border barriers.
- There is some evidence that the supply of high quality infrastructure enhances the overall appeal of a host country with respect to inward FDI. Moreover, good infrastructure conditions in both the home country and partner have a powerful positive effect on services exports.
- Anti-competitive regulations curb FDI and trade, with a particularly strong negative effect on services trade, which is sensitive to regulatory conditions in both the home country and the partner.
- High tax wedges on labour income and strict EPL also curb FDI and trade, but the effect of EPL on trade depends on the bargaining regime. Again, services trade is particularly sensitive to conditions in both the home country and the partner.
- Taken together, the results for services trade suggest that poor or inefficient infrastructure, lack of competitive pressures and adverse labour-market arrangements in trading partners could contribute to explain the low services trade intensities relative to goods trade observed in many OECD countries.

## HOW DO POLICIES SHAPE TRADE AND FDI PATTERNS?

The impact of policies on trade and FDI is significant, but how much of the observed differences in bilateral trade and FDI transactions among OECD countries can actually be explained by differences in policies? What are the policies that play the largest role in explaining such differences? What would be the effect of changing policies on trade and FDI? Bearing in mind the illustrative nature of any policy simulation based on regression results, empirical estimates can be used to provide tentative answers to these questions.<sup>60</sup> Specifically, this section quantifies *i*) the relative contributions of policies and other factors to the observed deviations of exports (of goods and services) and FDI from OECD averages; and *ii*) the long-run impact on total FDI instocks and export flows of changes in policies that affect border barriers, labour taxation and product-market regulation. It is important to notice that the quantitative effects highlighted in the policy

simulations depend on the specification of the estimated models as well as on the configuration of policies and the distribution of FDI stocks and trade flows in the baseline scenario. This is particularly the case for simulations concerning domestic regulatory policies in product and labour markets. Finally, given the specification of some of the policy variables, which entail a comparison between policies of the home country and the partner, diversion effects are not taken into account. To the extent that these effects are important, the simulation results may overestimate the effects of policy changes on the variables of interest.

### Accounting for cross-country patterns of trade and FDI

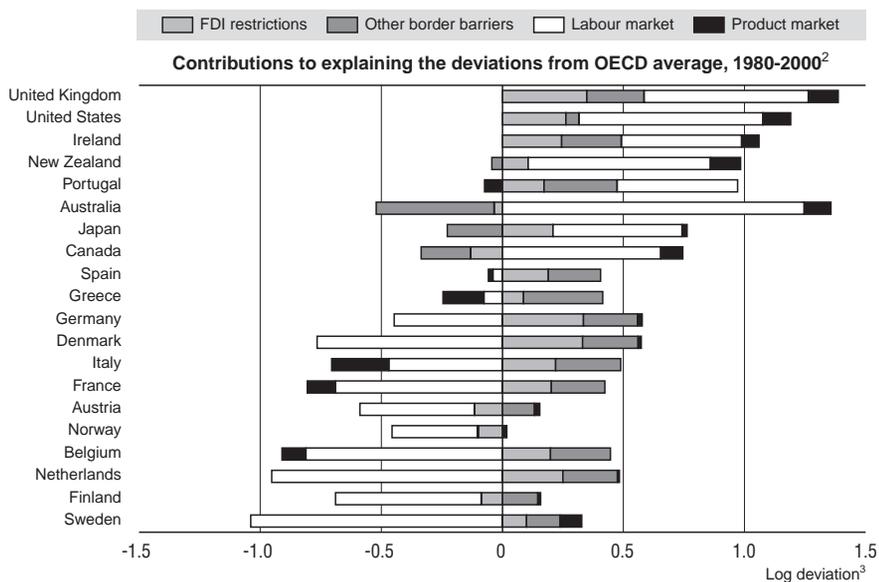
Figures 19-21 show the contributions of policies to the deviation (in logarithms) of total FDI in stocks, services exports and goods exports in each country from the OECD average over the 1990s. The figures also show how much of these deviations is explained on average by non-policy-related factors – including gravity forces, factor endowments and all effects that are not accounted for by the policy and non-policy-related variables in the regressions (*i.e.* the country and partner-specific fixed effects and the bilateral effects) – and the unexplained regression residual.<sup>61</sup> The decompositions shown in the figures are based on the results of the bilateral equations averaged over the estimation period and investor countries (for FDI in stocks) or importer countries (for exports of goods and services). The precise specifications on which the simulations are based are reported in the figures.

Policies influence bilateral FDI positions across member countries almost as much as all other (“non-policy”) factors taken together (Figure 19).<sup>62</sup> The most important policy effects come from labour-market arrangements and openness factors. A more detailed analysis shows that the labour tax wedge is the most influential component of these arrangements, with EPL playing a lesser role. Anti-competitive product-market regulations explain a smaller part of the deviations of FDI in stocks from the OECD average. However, these policy influences play different roles in different countries. For instance, while labour-market arrangements have a relatively positive influence on FDI in stocks in English-speaking countries, Japan and Portugal, they tend to depress them in other European countries. Similarly, while in most European countries and the United States openness factors play a positive role, comparatively restrictive border measures depress FDI in stocks relative to the OECD average in Canada, Australia and, to a lesser extent, Japan. The contribution of product-market regulation is significant for countries having either a relatively liberal approach (the United States, the United Kingdom, Australia, New Zealand, Canada and Sweden), where it pushes up relative FDI in stocks, or a relatively restrictive approach (continental European countries), where it pulls down relative FDI in stocks.

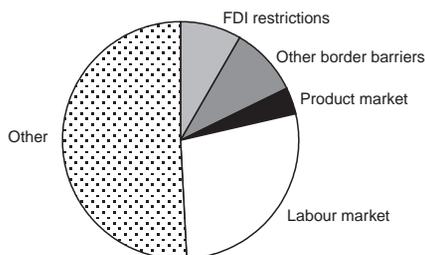
Policies also play an important (though smaller) role in explaining why services exports are above or below the OECD average (Figure 20). In this case, the

<sup>60</sup>

Figure 19. **Policies and inward FDI positions<sup>1</sup>**  
 Contributions to explaining the deviations from OECD average, 1980-2000<sup>2</sup>



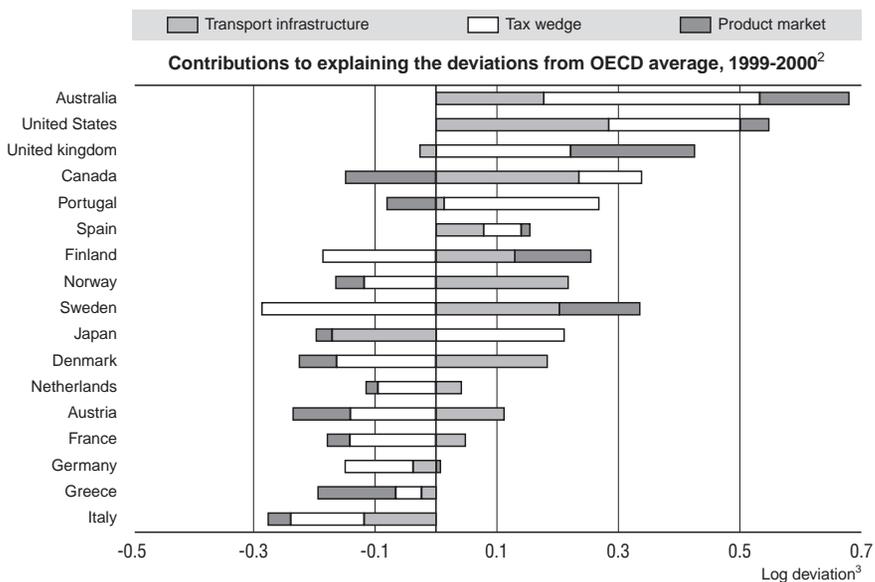
**Average contributions (absolute values)**



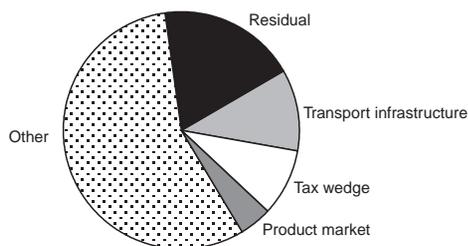
1. *Other border barriers* contains the contribution of tariff and non-tariff barriers of membership in a free-trade area. *Labour market* contains the contributions of the relative indicator of the tax wedge on labour income and of the relative indicator of employment protection legislation. *Product market* contains the contribution of the relative level of barriers to entry. *Other* include the contribution of the structural variables and dummy variables.
2. The contributions are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
3. Average is computed on countries included in the sample.

Source: OECD.

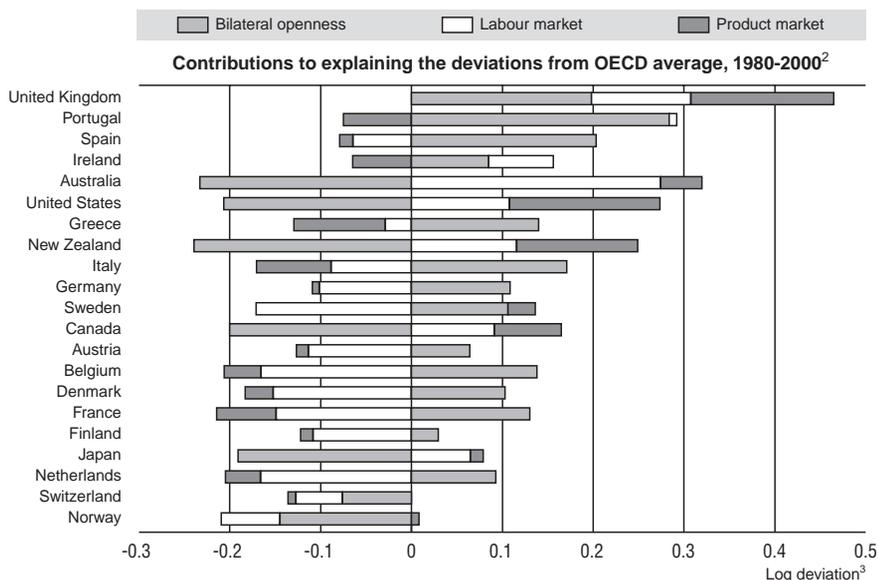
Figure 20. **Policies and services exports<sup>1</sup>**  
 Contributions to explaining the deviations from OECD average, 1999-2000<sup>2</sup>



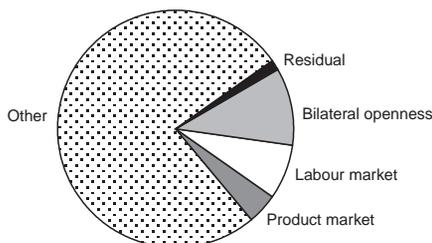
**Average contributions (absolute values)**



1. *Product market* contains the contribution of the level of barriers to entry. *Other* include the contribution of the structural variables and dummy variables. *Residual* contains the unexplained part of the variation.
  2. The contributions are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
  3. Average is computed on countries included in the sample.
- Source: OECD.

Figure 21. Policies and goods exports<sup>1</sup>Contributions to explaining the deviations from OECD average, 1980-2000<sup>2</sup>

Average contributions (absolute values)



1. *Openness* contains the contributions of bilateral tariffs of membership in a free-trade area. *Labour market* contains the contributions of the relative indicator of the tax wedge on labour income and of the relative indicator of employment protection legislation. *Product market* contains the contribution of the relative level of barriers to entry. *Other* includes the contribution of the structural variables and dummy variables. *Residual* contains the unexplained part of the variation.
  2. The contributions are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
  3. Average is computed on countries included in the sample.
- Source: OECD.

contribution of other factors is inflated by unexplained regression residuals, which are larger than for FDI. The contribution of policies to explaining services trade is more evenly distributed than for FDI among product-market regulation, the tax wedge, and infrastructure provision though the latter tends to predominate. The tax wedge favours services exports relative to the OECD average particularly in Australia, Japan, Portugal, the United Kingdom and the United States, while it penalises them in France, Austria, Finland, Denmark and, especially, Sweden. Having comparatively liberal product markets in services industries enhances services exports relative to the OECD average in the United Kingdom, Australia, Sweden, Finland and the United States, while relatively restrictive markets curb them in Canada, Greece, Portugal and Austria. Finally, relatively poor transport infrastructure endowments depress services exports in Japan and Italy, while its effect is either positive or close to zero in other countries.

Policies can explain only a relatively small part of the cross-country variance in goods exports (Figure 21). Most of this variance is explained by geographical and other non-policy-related factors (such as market size and distance from major OECD markets). The main policy influences come from bilateral openness (*e.g.* the border barriers faced by the exporter country when trading with its partners) and labour-market arrangements, while product-market regulations generally play a lesser role. Exports of EU countries are pushed up relative to the OECD average by bilateral openness with trading partners, which are mainly within the Single Market, while non-EU countries suffer from a relative lack of bilateral openness with respect to their EU trade partners. A closer look at the impact of policies in each country suggests that, in many cases, offsetting effects are at work. For instance, Australia, New Zealand, the United States, Canada and Japan are penalised by a relative lack of bilateral openness, but relatively liberal labour and/or product-market policies help to offset this negative bilateral openness. Conversely, while goods exports in European countries are stimulated by gravity factors, they are negatively affected by a relatively restrictive policy stance in labour and product markets. The only countries in which all policy factors depress goods exports relative to the OECD average are Switzerland and, to a lesser extent, Norway.

### **The impact of removing impediments to trade and FDI**

The lifting of border and non-border barriers to trade and investment figures significantly on both national and international policy agendas (see, for instance, World Bank, 2002, 2003; and OECD, 2001d, 2003). To quantify the likely impact of such policy changes, the preferred equations described above have been used to simulate the following hypothetical policy scenarios:

- *Policies aimed at lifting border barriers.* These include i) the OECD-wide alignment of FDI restrictions and multilateral non-tariff barriers on those of the

least restrictive OECD country; ii) the alignment of bilateral tariff rates on those of the least restrictive trading partner or the least restrictive country pair; and iii) the accession to the European Union by the Czech Republic, Hungary and Poland;

- *Domestic competition-oriented policies in product markets* that result in an alignment of product-market regulations on those of the least restrictive OECD country;
- *Domestic labour tax reforms* that result in the alignment of the labour tax wedge on that of the OECD country with the lowest wedge.

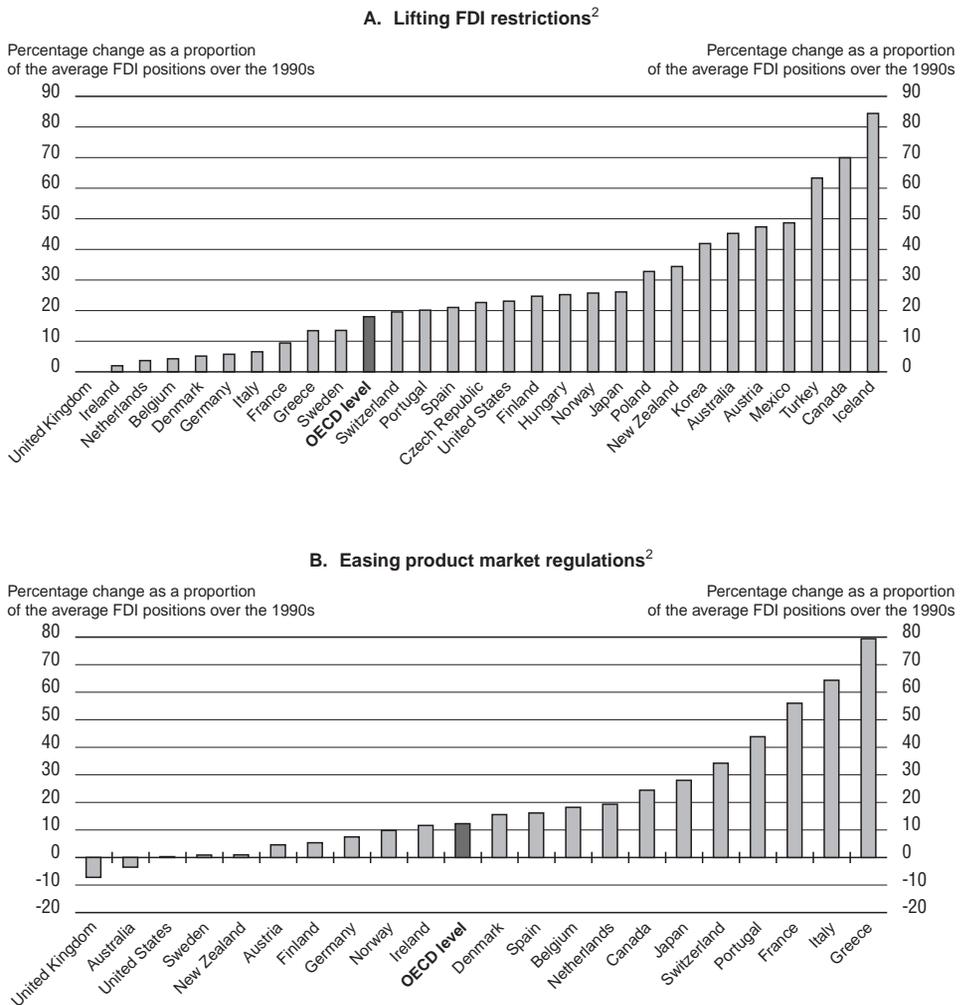
### **Policies and FDI**

Figure 22 (Panel A) shows the effect of bringing FDI restrictions in all OECD countries down to the level of restrictions in the United Kingdom, the least restrictive country according to the indicator described in Golub (2003). This move would require country-specific reforms that differ in content and scope depending on the patterns of FDI restrictions in place, but typically they would imply lifting screening requirements and restrictions on foreign shareholdings, and substantially reducing other restrictions (*e.g.* on the nationality of management, board composition and movement of people). The effects of such reforms on FDI instocks depend on how restrictive each country was before the policy move. Relatively restrictive countries could increase their total FDI instock by between 40 and 80 per cent, but even in countries that are estimated to be already relatively liberal the gains could amount to around 20 per cent of their initial instock.<sup>63</sup> Overall, such policy reforms could increase OECD-wide instocks by almost 20 per cent.

Reducing anti-competitive product-market regulations is also likely to increase significantly FDI instocks (Figure 22, Panel B). If all OECD countries were to reduce the level of their product-market regulations to that in the United Kingdom (the least restrictive country), OECD-wide instocks would increase by over 10 per cent relative to the initial instock. Since bilateral FDI outstocks are estimated to depend on the relative stringency of regulation in the home and host countries, relatively restrictive host countries – such as Greece, Italy and France – that host FDI from relatively liberal countries could increase their FDI instocks by as much as 60 to 80 per cent through regulatory reform. Conversely, countries that are relatively liberal would see the relative attractiveness of their product markets either unchanged (such as in the United States, New Zealand and Sweden) or even reduced (such as in the United Kingdom and Australia).

### **Policies and trade**

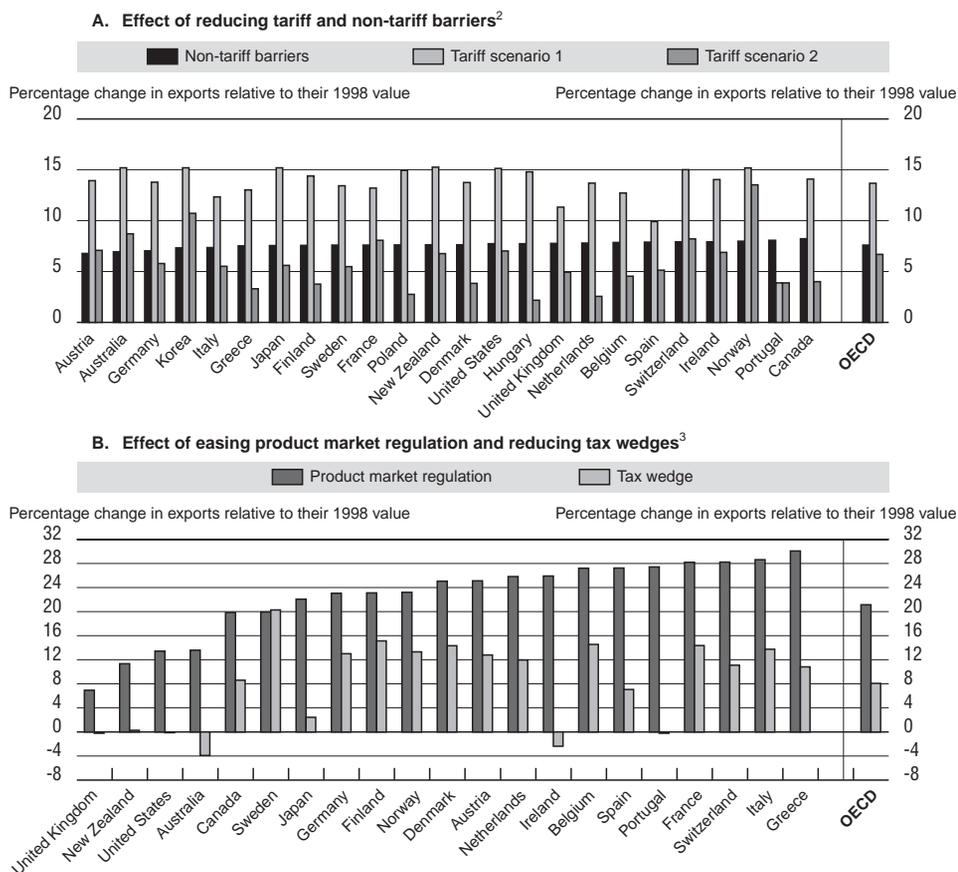
Figure 23 looks at the effects of three different policies – reducing tariff and non-tariff barriers (panel A), liberalising product markets and reducing the tax wedge on labour income (panel B) – on country-specific and OECD-wide goods

Figure 22. Policies and inward FDI positions: the scope for further integration<sup>1</sup>

1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.

Source: OECD.

Figure 23. **Change in goods exports from reducing tariff and non-tariff barriers, product-market regulation and the tax wedge on labour income<sup>1</sup>**



1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
2. *Tariff scenario 1*: bilateral tariffs are reduced to the least restrictive average bilateral tariff in the OECD (0.057% in 2001). *Tariff scenario 2*: for each country bilateral tariffs are reduced to the least restrictive average tariff it faces when trading with its OECD partners in 2001. *Non-tariff scenario*: the import coverage of multilateral non-tariff barriers is aligned in all countries to that of the least restrictive country in 1996 (Iceland). For Iceland, simulations cannot be presented as this country is present in the sample only as a partner.
3. The simulation shows the effects of an easing of regulations in all countries to the level of the least restrictive country and a decrease in tax wedges to the level of the lowest wedge country in 2000 (Australia).

Source: OECD.

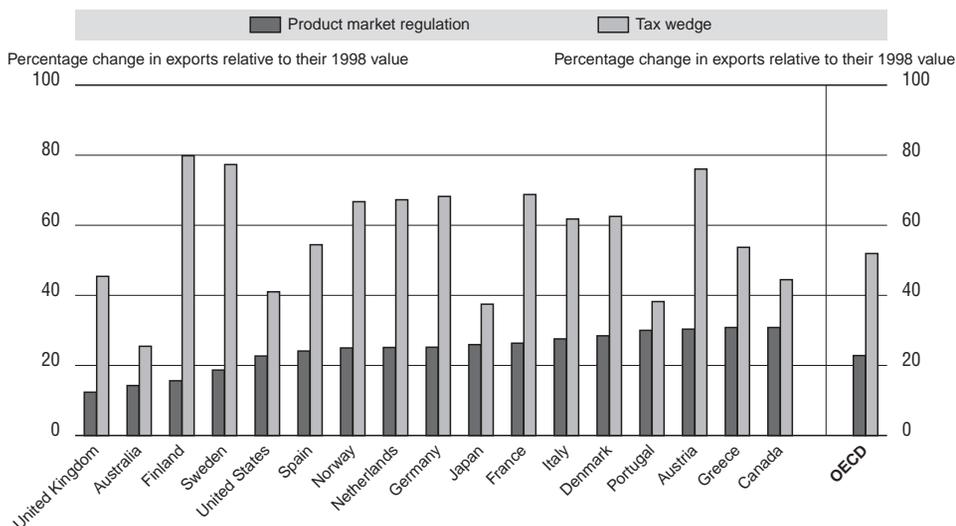
exports. Countries are ordered according to the cumulative gains obtained by implementing these policies. For bilateral tariffs, two scenarios are simulated: the decrease of tariffs to meet the lowest tariff among each country's trading partners; and the equalisation of all tariffs at the level of the lowest bilateral tariff observed in the OECD area. Consistent with regression results (see above), the liberalisation and labour tax reduction scenario take into account the cumulative effects on exports of policy changes in both the exporter and importer countries.

The increase in the level of total exports within the OECD area ranges from 6 to 20 per cent, depending on the policy package implemented. Unsurprisingly, the largest and most widespread gains are obtained by setting all bilateral tariffs to their minimum OECD level (close to zero), but significant large gains are also obtained when the import coverage of non-tariff barriers is reduced to the level found in the least restrictive country (Iceland according to the indicator presented above). Country-specific gains from these policies (relative to the level of exports in 1998) depend on the initial geographical distribution of a country's exports, but generally lie within a range of 10 to 15 per cent. The alignment of tariffs on those of the least restrictive partner would imply smaller gains (ranging from 4 to 10 per cent for most countries), partly because trade with high-tariff partners is usually weak. Simulated export gains from easing multilateral non-tariff barriers are more uniform across countries (around 7 to 8 per cent), partly reflecting the smaller cross-country differences due to the lack of the bilateral dimension in the available data.

Large OECD-wide gains are also obtained by aligning regulatory restrictions on those of the least regulated OECD country in 1998. The increase in exports implied by such policy for relatively restrictive countries – such as Greece, Portugal, Italy, France, Switzerland and Ireland – is about 30 per cent. Finally, curbing tax wedges to meet those of the lowest tax wedge country in 2000 (Australia) yields smaller, but still noticeable, OECD-wide gains. Indeed, in several European countries, where wedges are relatively high, this policy yields gains that are comparable to those obtained by reducing non-tariff barriers. Interestingly, the export losses implied by this policy scenario in a few countries (notably Australia and Ireland) reflect the relative loss in competitiveness of these countries' exports to countries that experience a large drop in the tax wedge as a result of the policy. On the whole, changes in policies have significant effects on goods exports in most countries, even though their absolute contribution to explaining deviations of exports from the OECD average is small (see above).

Figure 24 reports the results of a similar simulation for exports of services.<sup>64</sup> In this case, the gains implied by non-manufacturing product-market liberalisation and lower labour tax wedges are larger, reflecting the stronger estimated effect of policies on bilateral service exports. Tax and product-market reform could increase total services exports among OECD countries by 50 and 20 per cent, respectively.

Figure 24. **Change in services exports from easing product-market regulation and reducing the tax wedge on labour income<sup>1, 2</sup>**



1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.
  2. The simulation shows the effects of easing regulation in non-manufacturing industries to the level of the least restrictive country in 1998 (the United Kingdom) and aligning wedges to that of the lowest wedge country in 2000 (Australia).
- Source: OECD.

### EU accession, FDI and trade

Empirical results suggest that participation in free-trade agreements has had significant effects on both trade and FDI, especially within the European Union. Quantifying these effects is particularly important for OECD countries that will join the European Union in 2004, as established in the recent Athens EU Council Meeting. Table 6 suggests that the gains from EU accession for the Czech Republic, Hungary and Poland will indeed be sizeable in terms of trade integration and FDI stocks. This is due to both increased transactions with other EU countries and (to a lesser extent) increased trade and investment flows from non-EU countries. Trade flows are estimated to increase by around 10 per cent in both directions while FDI outstocks and instocks are estimated to double relative to average levels in

Table 6. **The effects of European Union accession on trade and FDI<sup>1, 2</sup>**

	Per cent increase in exports <sup>3</sup>	Per cent increase in imports <sup>3</sup>	Per cent increase in the FDI outstock <sup>4</sup>	Per cent increase in the FDI instock <sup>4</sup>
Czech Republic	11.5 (47.2)	10.9 (49.7)	103.0 (0.4)	112.0 (24.2)
Hungary	11.2 (45.0)	10.4 (47.8)	28.1 (1.6)	107.0 (19.3)
Poland	11.6 (15.0)	10.7 (26.0)	92.2 (0.3)	104.9 (9.3)

1. The simulations are based on coefficients estimated in panel regressions of bilateral outward FDI positions on non-policy factors (distance, transport costs, market size, similarity in size and factor endowments, and other country and time-specific effects) and policy influences (FDI restrictions, tariff and non-tariff barriers, participation in free trade areas, and product and labour market arrangements). The regressions cover bilateral FDI relationships between 28 OECD countries over the 1980-2000 period.

2. Initial levels relative to GDP are in parentheses.

3. Relative to 1998 values.

4. Relative to the average level over the 1990s.

Source: OECD.

the 1990s in most countries. However, these simulation results are likely to over-estimate the actual post-accession gains to the extent that trade and FDI stocks have already been affected by the expectation of EU membership.

## SUMMARY AND CONCLUSIONS

The results of the empirical analysis suggest that border openness to trade and investment and competition-oriented domestic policies have important implications for OECD trade and FDI patterns. The main conclusions in each of the broad policy areas examined in the paper are reviewed below under four headings.

### Openness: formal trade and FDI restrictions:

- The empirical results suggest that eliminating remaining tariff and non-tariff barriers could increase significantly exports of goods within the OECD. The removal of border barriers in existing free-trade areas, such as the European Union (EU) Single Market or the North American Free-Trade Agreement (NAFTA), is estimated to have boosted both goods trade and overall FDI flows among participating countries. Likewise, simulations suggest that prospective EU membership may be associated with increasing trade flows and booming inward FDI positions for new EU members. By contrast, free-

trade areas do not seem to have increased significantly cross-border supply of services.

- A number of countries (especially outside the European Union) still have a relatively restrictive FDI environment in some important non-manufacturing industries, such as electricity, transport and telecoms. Aligning FDI restrictions on those of the most liberal country would increase significantly the OECD-wide inward FDI position.
- There is some limited evidence that stable exchange-rate arrangements may positively affect the inward FDI position of participating countries. Through this channel, countries that are members of currency unions (such as the European Monetary Union) experience further integration of their markets in both the union itself and globally. The complexity of the relationship between FDI and exchange-rate variability suggests, however, that this aggregate result may mask a variety of different responses of MNEs to the establishment of currency unions.

#### **Product-market reforms:**

- The countries with relatively restrictive and costly product-market regulations will tend to have lower stocks of foreign capital. Thus, product-market reforms that reduce the relative restrictiveness of regulations are likely to increase the level of inward FDI in a given country. OECD-wide product-market reform can raise the *overall* stocks of inward and outward FDI outstanding, thereby increasing global integration.
- Exports are negatively affected by both home and destination country anti-competitive regulations. Such home regulations may reduce both productive efficiency and the range and quality of goods supplied in foreign markets (*e.g.* through their negative effects on entry and innovation), thus regulatory reform in the home country is likely to positively affect exports. Restrictive regulations in the destination (importer) country also curb exports from the home country by making access to markets more difficult for foreign suppliers. All else equal, a general convergence of regulation in the OECD area towards the regulatory environment of the most liberal country would tend to increase within-OECD exports markedly.
- In services trade, the combined negative influence of restrictive regulations in the exporting and the importing countries is even stronger, because it affects for instance the ability of the exporting country to sell air transport, tourism or banking services to a trading partner. Unilateral or concerted efforts by OECD trading partners to implement significant competition and efficiency-enhancing reforms at both ends of the transactions are likely to boost the global volume of trade in services.

**Labour-market reforms:**

- Estimates suggest that strict employment protection legislation (EPL) and high tax wedges on labour income may sometimes affect the labour market in the home country in ways that curb its exports, for instance by making the reallocation of labour across firms, industries and occupations difficult. Similarly, by raising the cost of investment in the host country, they tend to lower its inward FDI. There are, however, important interactions between EPL and the institutional set up in the labour market as was pointed out by Calmfors and Driffill (1988) and Elmeskov *et al* (1998). When collective bargaining and other labour-market arrangements favour wage adjustments that fully offset the costs of EPL, the potentially negative effect on exports can be neutralised. In other regimes where such compensation is difficult, strict EPL is associated with significantly lower exports. By contrast, the collective bargaining regime can hardly moderate the negative influence of strict EPL on FDI. If EPL increases the risk/return ratio on foreign investment, foreign investors are likely to choose locations where this ratio is lowest, irrespective of the potentially offsetting effect of the collective bargaining regime. Empirical estimates suggest that labour-market reforms easing employment protection legislation and lowering tax wedges on labour income would boost global economic integration.

**Infrastructure:**

- Improving network infrastructure has ambiguous *a priori* effects on FDI, because inadequate infrastructure may motivate foreign investment in these industries. However, good infrastructure conditions are likely to be important for reducing transport and communication costs and increasing trade, especially in some services where international transactions require such conditions to be good in both origin and destination countries (*e.g.* freight, tourism, finance). Thus, policies that improve infrastructure can significantly increase both the bilateral and global volumes of service trade.

## NOTES

1. The other important channel of globalisation is movement of people. For a discussion of migration trends, determinants and policies see OECD (2002a). Temporary movement of personnel is also an important mode of service supply that is not covered in this study.
2. The willingness of businesses to expand cross-border activity and their localisation decisions are likely to depend to some extent also on the taxation of profits of foreign subsidiaries. Patterns of FDI taxation and their effects on global integration are studied in two companion papers (Yoo, 2003; and Hajkova *et al.*, 2003).
3. This is in line with recent economic research (OECD, 2002a; Markusen and Maskus, 2001a, 2001b) that stresses the joint determination of trade and FDI flows. However, it is important to note at the outset that, due to the level of aggregation at which the analysis is performed, the long-standing issue concerning the substitutability or complementarity of trade and FDI is only dealt with tangentially in this document. This issue has been recently (and repeatedly) addressed elsewhere in the OECD by means of literature surveys (OECD 1995, 2002b) and empirical analyses using sectoral (OECD 1996, 1997a) and aggregate data (OECD 1998a).
4. Outward and inward positions are multilateral measures of FDI activity that cumulate for each investor country the bilateral stocks held in all FDI partner (host) countries (henceforth, outstocks) and for each host country the bilateral stocks held by all partner (investor) countries (henceforth, instocks).
5. FDI activity can in principle be decomposed into *i*) mergers and acquisitions, *ii*) greenfield investments, *iii*) reinvested earnings, and *iv*) capital transfers between related enterprises. In practice, available data rarely allow such decomposition to be made.
6. For instance OECD (2002c) considers the drop as a “correction” of the investment and stock market bubble that occurred at the turn of the century. High levels of FDI flows were also partly related to a flurry of unprecedented privatisation activity.
7. Geographical specialisation indicators for FDI inflows and outflows are broadly characterised by the same patterns. However, inflows indicators suggest that a “catch up” phenomenon is taking place in some countries, such as Greece *vis-à-vis* the European Union and Korea *vis-à-vis* Japan; and outflow indicators show that several countries (including a few EU members, Canada, the United States, New Zealand and Korea) had developed a specialisation in investing in Japan over the 1995-1998 period.
8. Data for the 1980-1990 period is incomplete or missing for transition countries and Korea.
9. For instance, services provided by a barber are hardly tradable between cities or regions within a country, not to mention across borders. However, the provision of

many other services, including some of the most dynamic ones over the past two decades (such as communication, financial intermediation and business services) involves lower transportation costs, which are further decreasing as information and communication technologies (ICT) spread out. Moreover, ICT are also decreasing transportation costs for services that were traditionally not tradable, such as retail distribution (see, for instance, OECD 2001b).

10. The effects of FDI taxation are studied in Hajkova *et al* (2003).
11. Policies can also affect trade and FDI indirectly, through their effect on factor proportions, for example by improving the quality of a country's infrastructure capital or the skills of its labour force.
12. Non-tariff barriers include so-called "core" measures, such as price controls (voluntary export restraints, variable charges, anti-dumping and countervailing actions) and quantitative restrictions (non-automatic licensing, export restraints, quotas and prohibitions). See OECD (1997b) for details.
13. *Multilateral tariff and non-tariff barriers* are derived from detailed data on *ad valorem* MFN tariff rates and the frequency of non-tariff barriers in 6-digit industries of the Harmonised System of Classification (UNCTAD, 1998). The data are aggregated using average 1998 OECD import weights up to the 2-digit ISIC Rev. 3 level and average 1998 OECD value-added weights thereafter. Information about cross-country differentials in import shares for different goods (net of intra-EU imports) was exploited to differentiate trade barriers across EU countries. *Bilateral tariffs* are based on the new MacMaps data produced jointly by the Centre d'Etudes Prospectives et d'Informations Internationales and the International Trade Center (Bouet *et al.*, 2001, 2002). The MacMaps data report information on MFN duties, other *ad valorem* duties, specific duties, preferential margins, prohibitions, tariff quotas and anti-dumping (specific or *ad valorem*) duties. These are aggregated to the 2-digit ISIC Rev. 3 level using average import weights differentiated by group of trading partners. Despite the use of *average* import weights in aggregation, both the multilateral and the bilateral indicators may tend to underestimate the extent of trade barriers if import shares are depressed in industries with high barriers.
14. Moreover, by enlarging the size of the market accessed at equal trade cost by third-party countries, they could also tend to increase bilateral trade between the free-trade area and non-signatory countries, all the more so if non-signatory countries are themselves members of a different free-trade area (because the reverse phenomenon may apply). In particular, intra-industry trade may increase due to enhanced economies of scale.
15. See Markusen (2002) for an extensive discussion of the conflicting forces acting on bilateral FDI flows as trade liberalisation is implemented.
16. This could partly explain the wave of within EU mergers and acquisitions that followed the Single Market Programme.
17. Neary (2002) argues that this tendency takes the form of consolidation of different plants into a single location within the free-trade area. He also notes that the increased competition from MNEs of signatory countries can have an opposite influence on third-party investors, leading them to *reduce* investment in the free-trade area.
18. Non-statutory barriers to FDI are very difficult to ascertain and quantify. However, some of them were included in the indicators, such as the absolute barrier repre-

- sented by full state ownership of business enterprises and hidden institutional or behavioural barriers documented in official reports.
19. To a large extent, the generalised decline in restrictions reflects full liberalisation of capital flows within the European Union (completed in the early 1990s) and the concomitant extensive privatisations both in the European Union and elsewhere (*e.g.* Mexico), which have opened up previously sheltered public firms and monopolies to foreign capital.
  20. The indicators are unable to capture differences in the enforcement of restrictions, which might be particularly important for screening requirements. Also, several countries have further eased restrictions since the data were last collected.
  21. A simple count of restrictions affecting different industries shows that 67 per cent of all restrictions concern the services sector (Sauvé and Steinfatt, 2003).
  22. The simple bivariate correlation across countries between the sectoral indicators of FDI restrictions and the sectoral shares of employment in foreign affiliates is negative and significant.
  23. Clearly the more these activities are centred in the host country, the less sensitive FDI is to changes in exchange-rate volatility. In Goldberg (1993) the effect of reduced volatility on FDI is ambiguous. On the other hand, Darby *et al.* (1999) stress the possibility of a negative impact.
  24. Details on the regulatory indicators shown in the figures can be found in Nicoletti *et al.* (1999), Nicoletti *et al.* (2001) and Nicoletti and Scarpetta (2003).
  25. While regulations that bar entry or raise costs may deter FDI, regulations that are aimed at protecting intellectual property rights (IPR) may increase the attractiveness of the host country for international investors, because protection of IPR makes it more difficult to imitate their firm-specific knowledge assets (*e.g.* through the movement of managers or employees from the foreign affiliate to local firms). See Smith (2001).
  26. This idea and related empirical evidence are explored in detail in Mirza and Nicoletti (2003).
  27. The summary indicator is the GDP-weighted average of the indicators of regulation in 12 non-manufacturing industries.
  28. For instance, there is evidence that certain product market regulations can hinder firm growth and curb R&D spending (Nicoletti *et al.*, 2001; Bassanini and Ernst, 2002). Both factors can constitute a handicap for internationalisation.
  29. Other important factors include, for instance, coverage of collective agreements, minimum wages and health and safety regulations, for which cross-country data are patchy or lacking.
  30. EPL and the social expenditures that are financed through labour income taxation may also lower transaction costs in the relationship between workers and firms, reduce labour market frictions and smooth out the social costs associated with adverse labour market outcomes. Through these channels, EPL and labour income taxation can actually have positive repercussions for export prices and expected investment returns. However, these effects are difficult to measure and, in this study, the focus is on the role they play in pushing up production costs.
  31. Moreover, in the same way as product market regulations, stringent EPL and high wedges in the home country may also encourage firms to localise production in countries where labour market rules and taxation are more favourable to business, thereby

- stimulating outward FDI; but at the same time EPL may handicap firms that want to do so by hindering their potential for reorganising production or growing in size. Nicoletti *et al.* (2001) find that the average size of firms is negatively related to the stringency of EPL in a panel of OECD countries and industries.
32. This idea was first put forth by Calmfors and Driffill (1988). See Elmeskov *et al.* (1998) for evidence on the interaction between EPL and bargaining mechanisms and Daveri and Tabellini (2000) for the interaction between labour income taxation and bargaining mechanisms.
  33. It is also possible that foreign investors may find the implications of restrictive EPL provisions more difficult to ascertain than domestic investors (due to an asymmetry of information) and hence have to face higher costs.
  34. More importantly, government policies (*e.g.* access regulations) are crucial for ensuring a regulatory and business environment which is conducive to efficient private investment in infrastructure. See Gönenç *et al.* (2000) and OECD (2001b) for a detailed discussion of these issues.
  35. Yeaple and Golub (2002) attempt to test these hypotheses and provide some support for the effects of infrastructure on comparative and absolute advantage.
  36. Deardorff (1995) shows that this relationship emerges from virtually all models of trade.
  37. The role of factor proportions in explaining trade flows is clearest in Heckscher-Ohlin models of trade. Moreover, in a general gravity framework relative endowments of human and physical capital also provide information on the supply of differentiated goods, which are usually skill and capital intensive (Evenett and Keller, 2002). Their role in determining vertical FDI is emphasised in Helpman (1984) and Helpman and Krugman (1985).
  38. Markusen (2002) notes that FDI has only a *relative* advantage over trade with distant countries. Therefore, distance and transport costs may well have a negative influence on the intensity of outward FDI.
  39. As mentioned above, the “financial” FDI data used in the analysis suffer from several drawbacks (*e.g.* they do not distinguish between mergers and acquisitions and green-field investment, and may be geographically biased to the extent that MNEs use strategically-located holding companies to intermediate their investments), but the period and country coverage of the data on foreign affiliates was too limited for the purposes of empirical analysis. As regards services trade, the countries excluded are Belgium, Luxembourg, the Czech Republic, Iceland, Poland, Turkey, New Zealand, Mexico, Switzerland. Belgium and Luxembourg are excluded from partners. The Slovak Republic was also excluded from the analysis because data for other variables are missing.
  40. For similar specifications see, for instance, Markusen and Maskus (1999) and Egger (2001). The reduced form approach implies that the estimated coefficients incorporate both direct and indirect effects of the explanatory variables. For example, the parameter of tariffs in the trade equations reflects both the direct effect on trade and the indirect effect operating through the effect of tariffs on FDI and the possible impact of the induced effect of FDI on trade.
  41. The focus on FDI outstocks or instocks (instead of outflows or inflows) is justified by the fact that the decision of firms concerns the level of local production, which is a function of the desired level of the local stock of FDI.

42. The year-on-year difference of transportation costs was smoothed out to eliminate excessive volatility in the data.
43. In FDI equations, bilateral and effective exchange rates capture valuation and asset effects. In trade equations, nominal exchange rates together with the determinants of relative prices (*i.e.* relative factor endowments and policies that affect production costs) capture real competitiveness effects.
44. In addition a specific dummy for English-speaking countries was introduced to test for the possible influence of “language” effects, but no such effect was detected perhaps due to the presence of the bilateral fixed effect.
45. This transformation involves expressing the data as deviations from the values for the average home country or the average partner, which eliminates partner-specific or home country-specific effects, respectively.
46. Thus, in preliminary regressions, FDI instocks were related to both the average restrictiveness of policies in the host-country’s FTA and their restrictiveness in the host country relative to other countries within the same FTA.
47. Due to data limitations, the total instock regressions covered only 10 to 19 OECD countries, depending on the policy variables included.
48. Distance could not be estimated in bilateral FDI equations because of its purely cross-section nature. Its effect is captured by the bilateral fixed effects which are accounted for non-parametrically. Transport costs were omitted from the bilateral service trade equations for two reasons. First, the measure used in this study is constructed as the difference in CIF-FOB in manufacturing trade, which may have little relevance for trade in services. Second, transport is one component of service trade, hence transport costs are likely to be endogenous to it.
49. Related to this, persistence could be also driven by the large share of reinvested earnings in FDI flows.
50. In the total instock regressions the relevant variable is the nominal effective exchange rate, which is a trade-weighted average of bilateral exchange rates. A depreciation of this rate does not necessarily imply a depreciation of all bilateral rates. Thus, the overall effect depends on the interaction of depreciation with the country mix of bilateral trade flows.
51. The estimated effect of restrictions is similar for FDI flows, with the reduction in flows implied by the restrictions varying between 9 and 70 per cent. The estimation results for FDI outflows are reported in Nicoletti *et al* (2003).
52. Available non-tariff measures are partner-specific variables that express MFN import protection against the average OECD exporter. Thus, they do not account for bilateral arrangements and other special regimes, including non-MFN treatment and anti-dumping measures. Bilateral tariffs do account for some of these factors, but are available only for the year 2001. It should be noticed, however, that results for bilateral tariffs are robust to the adjustment of standard errors for repeated observations over the time dimension.
53. The finding that FDI is boosted by EU membership is consistent with related evidence by Pain (1997) and Pain and Lansbury (1997). Positive effects of EU membership on FDI from third-party countries were also found by Dunning (1997) and Barrell and Pain (1998).

54. In the total instock equation regulation can be interpreted as being expressed relative to the OECD average.
55. Results for IPR are not robust to the adjustment of standard errors for repeated observations over the time dimension. The relationship between IPR protection and FDI is discussed in OECD (2002g).
56. In this case, however, statistical tests rejected the hypothesis that the effect is identical in both countries. Therefore, separate coefficients were estimated for wedges in the home country and the partner.
57. Transport would seem to be the main relevant infrastructure for trade in goods. It also plays an important role in trade in services, both directly through the freight and travel components of this trade and indirectly through the tourism component.
58. Excluding the low infrastructure countries yields insignificant (though correctly signed) estimates, probably due to the lack of sufficient cross-country variability in the data.
59. The restriction that the coefficients of (the log of) infrastructure in the country and partner are the same is supported by statistical tests.
60. In particular, this kind of simulations assumes that policy moves do not change the estimated average relationships (*i.e.* the estimated regression coefficients) between trade, FDI and policies and are thus subject to the Lucas critique (Lucas, 1976). Moreover, it is assumed that these average cross-country relationships are representative of relationships in each country.
61. Since differences in the level of trade and FDI across countries are captured by dummy variables, it is not surprising that policy variables appear to play a relatively small role in contributing to the overall variance in the data.
62. The unexplained residual is generally very small in the FDI equations.
63. In the simulations, the initial stock is defined as the inward FDI position in 1998.
64. Here regulation is specific to non-manufacturing and the most liberal country in 1998 is again estimated to be the United Kingdom.

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## The Regulation of Labor

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**ABSTRACT**

We investigate the regulation of labor markets through employment laws, collective bargaining laws, and social security laws in 85 countries. We find that richer countries regulate labor less than poorer countries do, although they have more generous social security systems. The political power of the left is associated with more stringent labor regulations and more generous social security systems. Socialist and French legal origin countries have sharply higher levels of labor regulation than do common law countries, and the inclusion of legal origin wipes out the effect of the political power of the left. Heavier regulation of labor is associated with a larger unofficial economy, lower labor force participation, and higher unemployment, especially of the young. These results are difficult to reconcile with efficiency and political power theories of institutional choice, but are broadly consistent with legal theories, according to which countries have pervasive regulatory styles inherited from the transplantation of legal systems.

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## I. Introduction

Every country in the world has established a complex system of laws and institutions intended to protect the interests of workers and to guarantee a minimum standard of living to its population. In most countries, this system encompasses three bodies of law: employment law, industrial and collective relations law, and social security law. Employment laws govern the individual employment contract. Industrial and collective relations laws regulate the bargaining, adoption, and enforcement of collective agreements, the organization of trade unions, and the industrial action by workers and employers. Social security laws govern the social response to needs and conditions that have a significant impact on the quality of life, such as old age, disability, death, unemployment, and maternity.

In this paper, we examine these laws in 85 countries through the lens of three major theories of institutional choice: the efficiency theory, the political power theory, and the legal theory. The *efficiency* theory holds that institutions adjust to serve the needs of a given society most efficiently. Each society chooses a system of social control of business that optimally combines market forces, dispute resolution in court, government regulation, and corrective taxes and subsidies. Under the *political power* theory, institutions are shaped by those in power to benefit themselves at the expense of those out of power. Both voting and interest group politics allow the winners to benefit at the expense of the losers, with checks and balances on the government limiting the extent of redistribution. Finally, under the *legal* theory, a country's approach to regulation is shaped by its legal tradition. Common and civil law countries utilize different strategies for dealing with market failure: the former relying on contract and private litigation, the latter on direct supervision of markets by the government. Under this theory, the

historical origin of a country's laws shapes its regulation of labor and other markets.<sup>2</sup>

Our focus on labor laws might be particularly helpful in distinguishing the political power theory from the legal theory. Roe (2000) and Pagano and Volpin (2000) have recently argued that the political power of labor has been central to legal and regulatory design of the 20<sup>th</sup> century (Roe 2000, Pagano and Volpin 2000). Using data on OECD countries, these authors challenge the observation of La Porta et al. (1997, 1998) that the differences in financial development among common and civil law countries are best understood in terms of legal theories. Roe (2000) in particular argues that civil law is simply a proxy for social democracy. An analysis of labor laws gives these political theories their best shot, for two reasons. First, we expect leftist governments to focus on labor regulations as a top priority for benefitting their supporters. Second, because labor laws are relatively recent, we would not necessarily expect a profound influence of the commercial legal tradition on their structure.

To assess these theories, we collect data on employment laws, collective bargaining laws, and social security laws as of 1997 for the Djankov et al. (2002) sample of 85 countries, and code these data to come up with a variety of measures of worker protection. We combine these data with already existing (and some newly collected) information on economic development, leftist orientation of governments, union power, political and economic constraints on government action, and legal origins to examine the determinants of the regulation of labor. We also examine data on the unofficial economy, labor force participation, unemployment, and relative wages to consider who benefits and who loses from the regulation of labor.

The available research on labor regulations is more extensive than that on most other

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<sup>2</sup>In footnotes, we also consider the cultural theory, under which regulations are shaped by a country's cultural history, such as the dominance of particular religious groups. The data do not support this theory, so we keep its discussion to a minimum.

laws. The Organization of Economic Cooperation and Development has sponsored the creation of a database of labor regulations in member countries (Nicoletti, Scarpetta, and Boylaud 1999; Nicoletti and Pryor 2001). The World Bank has assembled a data base of International Labor Office certifications for 119 countries, which provide a partial view of the labor laws as well (Forteza and Rama 2000). Heckman and Pages-Serra (2000) collect and examine an extensive data set of job security regulation for Latin American and Caribbean countries. Mulligan and Sala-i-Martin (2000) assemble and analyze data on social security systems. What distinguishes our data from the previous efforts is a combination of a significant coverage of countries and a comprehensive approach to labor market regulations.<sup>3</sup>

In the next section, we briefly describe some of the principal theories of the determinants of labor regulations and develop our hypotheses. In section III, we describe the data. In section IV, we present the data on the regulation of labor, and describe some of its basic regularities. In sections V and VI, we present the tests of alternative theories. Section VII concludes.

## **II. Hypotheses**

### *Efficiency*

Demsetz (1967) and North (1981) propose that the choice of institutions is dictated primarily by efficiency considerations. In their original form, these theories hold that there are fixed costs of setting up institutions, and that it becomes socially efficient to set them up only when the benefits cover the costs. More recently, research on efficient institutional choice has focused on the idea that different institutional arrangements, ranging from reliance on unbridled

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<sup>3</sup>There is also an extensive literature on the consequences of regulation of labor, including Lazear (1990), Besley and Burgess (2002), Fonseca, Lopez-Garcia, and Pissarides (2000), Heckman and Pages-Serra (2000), and Ichniowski, Freeman, and Lauer (1989), among others.

market forces, to contract and private litigation, to government regulation, to subsidies and social insurance, represent alternative modes of dealing with torts and market failures, which may be appropriate in different circumstances.<sup>4</sup> For example, different combinations of these strategies may be efficient in developed and developing countries.

Here we consider two versions of this theory. The first focuses on the distinction between regulation and social insurance. Social insurance may be the relatively more efficient way of dealing with market failures in countries with a lower social marginal cost of tax revenues, which presumably are the richer countries (Brennan and Buchanan 1980, Becker and Mulligan 2000). Poor countries must then regulate to protect workers from being fired or mistreated by employers, whereas rich countries provide unemployment insurance, sick leave, early retirement and so on because they can more cheaply raise taxes to finance such operations (Blanchard 2002). A similar argument would maintain that rich countries can better rely on courts and contracts to address potential market failures, including those in the labor market, and so do not need as much regulation as do poor countries, where contracts cannot be enforced.

The second version of the efficiency argument predicts exactly the opposite. It holds that the principal cost of regulation, relative to other forms of social control of business, is its potential for abuse of regulated firms by the government and its officials. Labor regulations can be used to force firms to hire and keep excess labor, to empower unions friendly with the government, etc. According to this argument, the rich and better governed countries have a comparative advantage at regulation relative to other forms of social control of business because their governments are less likely to abuse power. This view with respect to regulation in general

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<sup>4</sup>This argument is developed in Glaeser and Shleifer (2002, 2003), Glaeser, Scheinkman and Shleifer (2003), and Djankov et al. (2003b).

is described by Djankov et al. (2003b).

The basic thrust of efficiency theories is that countries at different levels of economic development should adopt different regulatory structures. The variation in patterns of regulation can also suggest which efficiency forces, if any, shape the regulation of labor. We note, however, that labor markets are not an ideal testing ground for efficiency theories, because the basic assumption of market failure is not nearly as convincing in those markets as in some others, and because there is no compelling argument that labor laws evolved toward efficiency through a long period of testing and social negotiation.

### *Political Power*

According to political power theories, institutions are designed not to pursue efficiency, but to transfer resources from those out of political power to those in power, as well as to entrench those in political power at the helm (Marx 1872, Olson 1993, Finer 1997). According to this view, institutions are not only generally inefficient, but are in fact designed to be so by political leaders to help themselves and their favored groups.

Political power theories come in two basic varieties. The first holds that the principal mode of political decision making is elections, and therefore the parties that win elections get to shape laws. The second variety, which applies to both democracies and dictatorships, holds that laws are shaped by the influence of interest groups (Olson 1965, Becker 1983).

Political power theories are by far the dominant explanation of the choice of labor regulations. In the electoral version, they hold that regulations protecting workers (or at least employed workers) are introduced by socialist, social-democratic, and more generally leftist governments to benefit their political constituencies (Esping-Andersen 1999, Hicks 1999). In

the interest group version, these theories hold that labor regulations are a response to the pressure from trade unions, and therefore should be more extensive when the unions are more powerful, regardless of which government is in charge.

Political theories also hold that the ability of those in power to use regulations to benefit themselves is limited by checks and balances on the government, which can come either from politics (Buchanan and Tullock 1962) or from markets. Dictatorships are less constrained than democratically elected governments, and therefore will have more redistributive laws and institutions. Constitutions, legislative constraints, and other forms of checks and balances are all conducive to fewer regulations. This theory found some empirical support in our previous work on the regulation of entry (Djankov et al. 2002). Likewise, economies open to trade may be less likely to introduce expensive regulations, because competition makes it less lucrative for governments to raise firms' regulatory costs (Ades and DiTella 1999, Rajan and Zingales 2003).

### *Legal Theory*

Legal theory has received considerable attention in the discussions of institutional evolution in the last several years. Two very distinct legal traditions evolved in Western Europe since the 12<sup>th</sup> century: common law and civil law. Common law emerged in England and is characterized most clearly by the importance of decision making by juries, independent judges, and the emphasis on judicial discretion as opposed to codes. From England, common law was transplanted to its colonies, including Ireland, U.S., Canada, Australia, New Zealand, India, Pakistan and other countries in South and East Asia, East Africa and the Caribbean.

Civil law evolved from Roman law in Western Europe through the middle ages, and was incorporated into civil codes in France and Germany in the 19<sup>th</sup> century. Civil law is

characterized by less independent judiciaries, the relative unimportance of juries, and a greater role of both substantive and procedural codes as opposed to judicial discretion. Through Napoleonic conquest French civil law was transplanted throughout Western Europe, including Spain, Portugal, Italy, Belgium, and Holland, and subsequently to the colonies in North and West Africa, all of Latin America, and parts of Asia.

The German code became accepted in Germanic Western Europe, but also was transplanted to Japan and from there to China, Korea, and Taiwan. Socialist law was adopted in countries that came under the influence of U.S.S.R., while an indigenous Scandinavian legal tradition developed in Sweden, Norway, Denmark, Iceland and Finland.

The legal theory holds that countries in different legal traditions utilize different institutional technologies for social control of business (Djankov et al. 2003b). Common law countries tend to rely more on markets and contracts, and civil law (and socialist) countries on regulation (and state ownership).<sup>5</sup> For the labor market, this implies that civil law countries and socialist law countries should regulate labor markets more extensively than common law countries. The legal theory would also predict that common law countries should have a less generous social security system, because they are more likely to rely on markets to provide insurance. Perhaps most importantly, the legal theory predicts that patterns of regulation of different activities are correlated across countries. These predictions are tested below.<sup>6</sup>

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<sup>5</sup>Legal theories have been tested in other areas of law. Compared to civil law and particularly French civil law countries, common law countries have better legal protection of shareholders and creditors (La Porta et al. 1997, 1998), lighter regulation of entry (Djankov et al. 2002), less formalized legal procedures for resolving disputes (Djankov et al. 2003a), and securities laws more focused on private contracting than regulation (La Porta et al. 2003a).

<sup>6</sup>Because legal systems were transplanted largely through conquest and colonization, one can argue that the influence of the legal origin is an exogenous determinant of institutional choice.

Legal theories have been challenged by advocates of political power theories, such as Roe (2000) and Pagano and Volpin (2000), who argue that at least in Western Europe, the civil law tradition has often coincided with the political pressure to regulate, usually coming from the left. By combining extensive data on political orientation and legal origins for a sample of 85 countries, we attempt to distinguish the pure political power from the pure legal theory. We also argue, at the end of the paper, that reality is probably best described by a hybrid model.

### **III. Measures of Labor Regulation**

We construct a new data set describing the legal protection of workers in 85 countries in 1997. We gather data on the three components of the legal framework for worker protection: (i) employment laws; (ii) industrial (collective) relations laws, and (iii) social security laws.

To identify issues subject to statutory regulation in the area of employment and industrial relations laws, we use the OECD Jobs Study (1994) and the International Encyclopaedia for Labor Law and Industrial Relations. For social security laws, we follow the de-commodification index of Esping-Andersen (1999), regarded as a leading empirical comparison of social security systems among developed countries (Hicks, 1999, p. 249). We also rely on several cross-country secondary sources, including the International Encyclopaedia for Labour Law and Industrial Relations, the ILO's Conditions of Work Digest (1994, 1995), and the U.S. Social Security Administration's Social Security Programs Throughout the World. For each law in each country, we identify the government regulation of each specific area, and assign a higher score when a regulation is more protective of a worker. We then construct indices for each area of the law that aggregate these scores. Table I contains detailed definitions of all the variables used in the paper.

To ensure comparability and consistency across countries, we consider a “standardized” male worker with the following characteristics: (i) he is a non-executive full-time employee working in the same firm for 20 years;<sup>7</sup> (ii) his salary plus benefits equals the country's GNP per worker during the entire period of employment; (iii) he has a non-working wife and two children, and the family has always resided in the country's most populous city; (iv) he is a lawful citizen who belongs to the same race and religion as the majority of the country's population; and (v) he is not a member of a labor union (unless membership is mandatory). For social security, we also assume that the worker retires at the normal retirement age as defined by the country's laws; sickness lasts for 2 months; and the unemployment spell lasts for one year. We also assume a “standardized” employer with the following characteristics: (i) it is a manufacturing company wholly owned by nationals; (ii) its legal domicile and main place of business is the country's most populous city; (iii) it has 201 workers; and (iv) it abides by every law and regulation, but does not grant workers more prerogatives than are legally mandated. Also, (i) when both a standard duration and a possible extended period of time are provided by law, we choose the standard period; (ii) we use 30-day months and assume 22 working days per month and 5 working days per week; and (iii) when we find complementary coverage mechanisms, all applicable mechanisms are taken into account.

### *Employment laws*

Employment laws govern the individual employment relation, including the formation of the individual labor contract, the mandatory minimum terms and conditions of such contract, and

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<sup>7</sup>Results are similar for a worker with only three years of employment.

the termination of the contractual relation. Accordingly, we group the provisions of employment laws into three broad areas: (i) alternative employment contracts; (ii) conditions of employment; and (iii) job security. For each area, we collect several indicators and aggregate them into sub-indices and then the overall index of employment laws. We follow the same procedure for industrial relations and social security laws.

The first broad area covers restrictions placed on alternative employment contracts. If the regulation of alternative contracts is more flexible than that of regular contracts, the former will be used to by-pass standard labor provisions. The three main alternatives to the standard employment contract are part-time, fixed-term, and family members' contracts. Workers hired under such contracts are typically paid lower benefits and are subject to less onerous termination rules. Our indicators in the alternative employment contracts sub-index cover both the permissibility and the characteristics of these contracts.

The second broad area covers the conditions of the employment contract. The legal provisions here cover three areas: (i) flexibility on working time requirements (including mandatory daily rest, maximum number of hours in a work week, premium for overtime, and restrictions on work at night and on weekends); (ii) mandatory payment for non-working days (including paid annual leave, holidays, and maternity leave); and (iii) minimum wage legislation.

The third broad area is job security, or legal protection against dismissal, which encompasses: (i) grounds for dismissal; (ii) procedures for dismissal; (iii) notice period; (iv) severance payment; and (v) the constitutional principles covering protection against dismissal.

The rules on grounds for dismissal range from 'contract at will,' where the employment relation may be terminated by either party at any time and with no limitations other than those contained in the agreement, to allowing the termination of employment contracts only under a

very narrow list of ‘fair’ causes that may not be contracted around by the parties, to refusing to consider dismissal on economic necessity (redundancy) as a fair cause for firing employees. The law may restrict the employer’s freedom to dismiss by requiring mandatory notification or even the approval from unions, workers councils, the public employment service, a labor inspector, or a judge. Some countries also require rehabilitative measures (retraining and allocation of another job within the enterprise) prior to the dismissal, and establish priority rules for dismissal or re-employment of redundant workers. Job security regulations also cover the timing and the cost of dismissal. Some countries mandate a lengthy advance notice for termination, while others leave this issue to the individual employment contract. Similarly, the termination of the employment agreement sometimes carries no payment at all or a payment in lieu of notice.

### *Industrial relations laws*

Industrial relations laws aim at collectively protecting workers from employers.<sup>8</sup> They govern the balance of power between labor unions and other forms of organized work, and employers and associations of employers. We aggregate industrial relations laws into three sub-indices: (i) collective bargaining; (ii) workers’ participation in the company’s management; and (iii) collective disputes (strikes and lockouts), and then aggregate those into an index.

Collective bargaining covers several areas. First, some countries require employers to bargain with organized workers (e.g., unions and workers’ councils), while others allow them to refuse to do so. Second, in some countries collective agreements are extended to third parties as

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<sup>8</sup> Some provisions aim to protect workers from other workers. For instance, “right-to-work” laws in the U.S. protect workers from unions by prohibiting the exclusive hiring of union labor. Such cases are rare and the bulk of industrial relations provisions directly protect workers from employers.

a matter of public policy at the national or sectoral levels, whereas in others they only extend to non-signatory workers at the plant level, or only bind the parties to the agreement. Third, the laws of some countries include rules requiring the exclusive hiring of union labor in certain industries or factories (closed shops).

The second sub-index captures worker participation in management, which may take the form of mandatory appointment of workers to the board of directors (the German model of co-determination), or workers councils (the Swedish model). Most countries do not provide a mechanism for worker participation. These two variables (and the presence of worker participation in the constitution) form the sub-index of worker participation in management.

The third sub-index covers the regulation of collective disputes. This area covers: (i) legal strikes; (ii) procedural restrictions to strikes; (iii) employer defenses; (iv) compulsory arbitration; and (v) the constitutional protection of the right to strike. A few nations have a straight prohibition of strikes; others limit the types of lawful strikes. For example, solidarity strikes (to support the claims of workers other than the striking workers), wildcat strikes (not authorized by the labor union), political strikes, and sit-ins are often prohibited. Procedural restrictions on the right to strike include majority voting, advance notice requirements, prohibitions on strikes while a collective agreement is in force, and the obligation to go through conciliation procedures before the strike may take place. Restrictions on employer defenses may include bans on employers' strikes (lock-outs) and on employers' retribution against strikers, such as the termination of employment of striking workers and the hiring of replacement labor during a lawful strike. Importantly, in many countries, the employer or both of the parties may be subject to arbitration against their will. Finally, the right to industrial action may be protected by the constitution.

*Social Security laws*

The bulk of social security expenditure across countries addresses old-age pensions, sickness and healthcare coverage, and unemployment. Following the design of the de-commodification index of Esping-Anderson<sup>9</sup>, our variables cover the risks of: (i) old age, disability, and death, with an emphasis on old age; (ii) sickness and health, with an emphasis on sickness; and (iii) unemployment. We code five variables for each one of these three risks. The first is always a dummy measuring whether the laws of the country provide for a mandatory and comprehensive social security system to cover the particular risk.

For the sub-index of old age, disability and death, the other four indicators are created as follows. First, the generosity of pension protection is calculated as the normalized difference between the legal retirement age and the worker's life expectancy. The second indicator is the required time of contributions to access a pension. We measure the number of months of contribution or of covered employment required by law to qualify for a standard pension. The third indicator is the percentage of the worker's monthly salary deducted by law to cover old-age, disability, and death benefits. Our last indicator of the level of protection of the pension system is the "replacement rate," calculated as the percentage of the pre-retirement salary covered by the standard old-age cash-benefit pension.<sup>10</sup> We use a similar methodology for the sub-indices of sickness and health, and of unemployment.

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<sup>9</sup> Esping-Anderson used the share of the relevant population covered as a weight for the variables in his index for 18 developed countries. This information is not available for a large sample of countries, so we present the un-weighted data. The correlation between the Esping-Anderson index and our index of social security laws for the 18 countries in his sample is 0.47.

<sup>10</sup>Countries vary in the type of pension system they have, including lump-sum systems, private systems, and systems that provide fixed benefits to everyone. Table I describes the details of how the calculations are made depending on the type of the pension system.

### *Independent Variables*

We assemble data on a number of potential determinants of labor regulations, as well as some labor market outcomes. We measure the level of development using the (logarithm of) per capita income in 1997 – the same year as when the regulations are measured.

To measure government orientation, we expand the World Bank data base, which records the fraction of years between 1975 and 1995 that a chief executive and the largest party in the legislature in each country was rightist, leftist, or centrist. We present results for three variables measuring leftist government (these variables yield the strongest results in favor of the political theory): (i) chief executive of left or center orientation; (ii) legislature of left or center orientation; and (iii) chief executive AND legislature of left or center orientation. We rely on union density and the percentage of the labor force covered by collective agreements as proxies for the influence of labor interest groups.

To measure political constraints, we take from Djankov et al. (2002) constraints on executive power, effectiveness of legislature, and autocracy. To measure economic constraints, we take from Frankel and Romer (1999) actual trade openness in 1985, geographic openness, and factor accumulation openness. To test legal theories, we use the legal origin of commercial laws from La Porta et al. (1999). Labor market outcomes include the size of the unofficial economy, labor force participation, unemployment including that of the young, and a crude measure of relative wages of protected and unprotected workers.

## **IV. A Look at the Data**

Table II presents the sub-indices and indices of employment protection and industrial relation laws for each country in the sample. Countries are ordered by per capita income in 1997 and divided into the poorest quartile, the next 50 percent, and the richest quartile. We also compare the means and the medians of the various sub-indices and indices across income groups. Recall that all variables are coded so higher values mean more protection/regulation.

A comparison of New Zealand and Portugal, two countries of roughly similar incomes close to the top of the middle group, illustrates our indices. In the area of employment laws, fixed term contracts can be entered in New Zealand for any reason, and there is no maximum duration period provided by law. In Portugal, such contracts are allowed only for specific situations (such as substitution for another worker or seasonal activity) and are temporary in nature. The Portuguese Constitution regulates working times and leaves, remuneration, and working conditions, matters that in New Zealand are normally regulated by collective bargaining and individual employment contracts. Premium for overtime work in Portugal ranges from 50% to 75%, there are restrictions on night work, and there are 24 days of paid annual leave. New Zealand mandates no premium for overtime work, there are no restrictions on night work, and paid annual leave is 15 days. New Zealand allows “contracts at will,” which can be terminated with notice by either party without cause. Portugal has a public policy list of fair grounds for termination and stringent procedural limitations on dismissal, such as mandatory notification of the government and priority rules for re-employment of redundant workers. In New Zealand, “reasonable notice” is required to dismiss a worker, in Portugal the length of such notice is mandated by law. The employment laws index in Portugal is 2.36 (one of the highest in the world); in New Zealand it is 1.06 (one of the lowest in the world).

In the area of industrial relations laws, the Portuguese Constitution includes the rights to engage in collective bargaining and collective disputes, the right to form trade unions, and the rights of such unions to participate in the management of individual companies and in greater political issues and bodies. Employer defenses against strikes are prohibited by the Constitution. Employers have a legal duty to bargain with unions, collective agreements are extended to third parties by law, workers councils are mandatory, and employer lockouts are prohibited. In New Zealand, none of these issues are covered in the Constitution, and most are not even regulated by law. Employers have no legal obligation to bargain with unions, collective agreements are not legally extended, labor participation in management is not mandatory, and employer lockouts are allowed. Portugal's collective relations laws index is 2.26, compared to 0.43 for New Zealand.

Finally, although social security is regulated by the Constitution in Portugal but not in New Zealand, both countries have similar – and generous – social security systems, with each scoring 2.15. We show below that New Zealand and Portugal are representative of broader patterns in the data.

As Table II shows, most countries restrict alternative employment contracts, conditions of employment, and job security. There is little evidence of any major difference in regulation between the poorest and the middle income countries, but there is clear evidence that the richest countries, if anything, protect employment *less*.

With respect to industrial relations laws, collective bargaining mandates are extremely common, but appear to be more so in middle income countries than in either the poorest or the richest countries. Worker participation in management is uncommon everywhere. The regulation of collective disputes is similar across income groups. For the overall index of

regulation of industrial relations, collective bargaining mandates dominate, and show the greatest empowerment of collective bargaining in the middle income countries.

Table III focuses on social security protections. Here the results are clear: richer countries have more extensive social security protection in all areas, including old age, disability and death, sickness, and unemployment. Indeed, few poor nations have social security programs for sickness (54%) and unemployment (27%) as compared to the almost 100% availability of these programs in the richest countries. The three sub-indices describing the scope of social security benefits tell a similar story.

Table IV presents the correlations among our variables. First, looking across countries, the correlation between our index of employment laws and that of social security laws is 0.0746, which argues against the view that regulation and social insurance are substitutes. Second, leftism and legal origin are weakly correlated other than in socialist countries. This allows us to empirically separate the role of leftist politics and legal traditions in shaping labor laws.

## **V. Testing the Theories**

In Table V, we examine the relationship between the protection of workers and legal origin, holding income constant. We present the results for all three areas of law. The results confirm our earlier finding that employment protection is generally weaker in richer countries, regulation of industrial relations does not monotonically depend on income, and social security protections increase sharply with income. The results further show that, relative to common law countries, socialist and French legal origin countries mandate sharply higher employment protection. German legal origin countries have somewhat higher employment protection than do the common law countries (but not in the area of restricting employment contracts), while

Scandinavian countries are about the same as the common law countries. The magnitude of the difference between common law and French civil law countries (holding GNP per capita constant) is large: it is 1.25 times the difference between the richest and the poorest countries.

In the area of industrial relations, we see a somewhat different pattern. As with worker protection, socialist and French legal origin countries have sharply higher worker protection through industrial relations laws than do the common law countries. But here, although the evidence for the sub-indices is weak, German and Scandinavian law countries have more protective collective relations laws than do the common law countries.

In the area of social security, there is clear evidence of more generous regulation in the socialist legal origin countries than in the common law countries (except in the area of old age benefits). Next to the socialist countries, the Scandinavian countries have the most generous social security systems relative to the common law countries. The difference between French civil law and common law countries is less pronounced, and is the highest for sickness and health benefits. There is no statistically significant difference between German legal origin and common law countries in the generosity of social security schemes.

Table V delivers a preliminary message. In the protection of workers through employment and industrial relations laws, we see a repetition of a now well-documented result that civil law countries, and especially French civil law countries, regulate markets more heavily than do the common law countries (La Porta et al. 1999, Djankov et al. 2002). Perhaps the most striking fact about these regressions is the high  $R^2$ 's: 52% for the employment laws index, 33% for the industrial relations laws index, and 66% for of the social security laws index (where per capita income has significant explanatory power).

Table VI examines the effect of left political power on the protection of workers. First, countries with longer histories of leftist or centrist governments between 1975 and 1995 have heavier regulation of labor markets, as measured by either employment or industrial relations laws. In addition, on any measure of leftist/centrist government, countries with a longer history of such government have more generous social security laws.<sup>11</sup> Second, a higher percentage of the labor force covered by collective agreements is associated with more protective employment and industrial relations laws, though not with more generous social security systems. In contrast, union density is associated with more generous social security systems although it does not influence labor laws significantly. Third, the explanatory power of the political variables is sharply lower than that of legal origins in Table V. The bottom line of Table VI is that the measures of leftism are associated with heavier labor regulation, although their explanatory power is smaller than that of legal origin.

Table VII presents the results of a horse race between legal origins and measures of leftist government. We run these regressions without socialist countries, since law and politics are nearly perfectly correlated among those countries. Except for social security laws, where there is marginal evidence of greater generosity in more leftist countries, the effect of our political variables on labor laws disappears. On the other hand, the effects of legal origins remain highly statistically significant, and the coefficients hardly change. We conclude that the

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<sup>11</sup>These results also hold, although at lower level of statistical significance, if we use the pure leftist government variables (rather than the combination of leftist and centrist governments). As an additional robustness check, on the theory that many labor laws were adopted before 1975, we rerun these regressions using a new data set on political coloration of governments starting in 1928. For these longer horizon variables, there is no evidence that the fraction of years that the leftist (or leftist/centrist) executives, or legislatures, or both, spent in office has influenced the structure of employment and collective relations laws. All measures of leftist power continue to be associated with more generous social security regimes, a fact that undermines the claim that we have a poor measure of leftist power.

effects of legal origin on the regulation of labor are much larger and more pronounced than those of politics.<sup>12</sup>

Several findings emerge from this section. First, socialist and French legal origin countries are more interventionist in their employment protection and industrial relations laws than are common law countries. Second, leftist government and higher union influence are associated with heavier regulation of labor markets, although these results are not consistent across specifications and do not survive the inclusion of legal origin in the regression. The evidence so far provides strong support for legal theories, is consistent with a particular version of the efficiency theory, and does not lend much support for the political theory. Moreover, the results (including the correlations) reject the view that legal origin and leftism are the same thing.

## VI. Further Tests

In this section, we examine four additional pieces of evidence bearing on alternative theories. First, we ask whether political and economic constraints on government reduce the regulation of labor, as the political theory would predict. Second, we ask whether politics matters for regulation *within* legal origin, which is a hybrid legal/political hypothesis. In addition, we present some evidence bearing on the strong prediction of the legal theory, namely that countries have regulatory styles, and that therefore there should be a strong correlation across countries of the extent of regulation of *different* activities. Finally, we examine some of

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<sup>12</sup>We also considered the effects of the religious composition of the population in 1900 -- our proxy for culture -- on contemporary labor laws. There are a few statistically significant coefficients indicating that catholic countries have more protective labor laws, but the evidence is weak, and does not survive a horse race with legal origin.

the consequences of labor regulation with the twin goals of testing the efficiency theories and of understanding who gains and loses from the regulation of labor.

### *Constraints on Government*

Under the political theory, a more constrained executive would pursue less aggressive policies favoring his supporters at the expense of others, such as the regulation of labor. Constraints can come from politics itself: autocrats are less constrained than elected officials, effective legislatures can restrain the sovereign, constitutions may include checks and balances (Brennan and Buchanan 1980, Henisz 2000, La Porta et al. 2003b). Alternatively, constraints can come from markets, and in particular, openness to trade raises the cost of labor market intervention and thus may reduce it (Ades and DiTella 1999, Rajan and Zingales 2003).<sup>13</sup> The prediction of the political theory is that such constraints would be associated with lower levels of government regulation of labor, other things equal.

Table VIII presents the correlations between our six measures of economic and political constraints and other determinants of the regulation of labor. The three measures of political constraints are strongly correlated with each other, as well as with the level of per capita income. This fact presents a problem for testing political constraints theories, since the measures of political constraints may just reflect some other country characteristic associated with development. The three measures of trade openness are also highly correlated with each other, but only factor accumulation openness is highly correlated with income. On the other hand,

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<sup>13</sup>Openness to trade may be endogenous, but we follow Frankel and Romer (1999) in also using a measure of “natural openness,” which is determined by a country’s geography.

except for the fact that governments in socialist countries face few economic and political constraints, the constraint variables are not strongly correlated with legal origins.

Table IX examines the effect of constraints on government on regulation. The table shows that more constrained governments have lighter regulation of labor markets in both the employment protection and industrial relations areas. The results hold as well if we exclude socialist countries. Basically, every measure of constraints except factor accumulation openness works. The constraints variables also eliminate the negative effect of development on employment regulation. Put differently, that effect might have come from the fact that richer countries have more constrained governments. Despite the statistical significance of the coefficients, the explanatory power of these constraints is sharply lower than that of legal origins. With respect to social security, the evidence is less consistent, but again shows that more constrained governments have smaller systems.

In Table X, we restrict the sample to non-socialist countries, and check whether these effects of political and economic constraints remain significant once we control for legal origin. The results for political constraints disappear, those for openness become a bit stronger. Legal origin remains a very important determinant of the patterns of labor market regulation.

### *Regulation Within Legal Origin*

It may be possible to treat the legal and the political theories as complementary. The former holds that civil law countries, particularly the French civil law countries, specialize in regulation as a means of social control of business, whereas the common law countries specialize in contracts and markets. Because of transplantation, these patterns of institutional specialization are largely exogenous. One could further argue that, because of such

specialization, French civil law countries are more likely to respond to the increased political demand for regulation by having more of it than do the common law countries, since the marginal social cost of providing such regulation is lower. Put differently, civil law provides a ready tool box for regulation, whereas common law is not nearly as user-friendly because of its emphasis on contracts. This logic predicts that there should be a stronger positive association between leftism and regulation in French civil law than in common law countries.

Table XI shows that, indeed, within French civil law but not within common law countries, leftism is associated with more protective employment and industrial relations laws. The difference in slope coefficients on our measures of leftism between common and French civil law countries is typically statistically significant. This result still puts the legal theory center stage, and surely does not support the view that legal origin is a proxy for social democracy. On the other hand, the result points to a hybrid view that within the institutional technologies dictated by legal systems, politics indeed plays a role in regulatory choice.

### *Regulation Across Activities*

One of the strongest implications of the legal hypothesis is that societies have regulatory styles shaped in part by their legal systems, and that therefore societies that regulate one activity are also expected to regulate others, which might be totally unrelated. We have already shown in earlier work that French civil law countries regulate entry of new firms, dispute resolution in courts, and other activities more heavily than do common law countries (La Porta et al. 1999, Djankov et al. 2002, 2003a). The findings of this paper are broadly consistent with this research.

Table XII presents the correlations between our new measures of regulation of labor markets and the measures of regulation of entry from Djankov et al. (2002) and measures of legal formalism from Djankov et al. (2003a). The data show that all these aspects of regulation go together, even though the methodologies of data collection differ tremendously across the three studies. The correlation between the employment law index and the judicial formalism index is 0.48 for one case, and 0.58 for the other. The correlation between the employment law index and the logarithm of the number of steps required to start a business is 0.62. These correlations fall by about 0.05 if we exclude socialist countries, but remain highly statistically significant. Regulatory style is pervasive across activities -- a striking confirmation of the legal theory.

Combined with the previous findings of the interaction between legal origin and politics, these results suggest that countries have regulatory styles, shaped primarily by transplantation of legal systems. Politics plays a role within the general regulatory framework presented by these styles, but it is neither as important as the styles themselves, nor is it a proxy for them.

### *Outcomes*

Finally, we consider some of the consequences of the regulation of labor. Theoretically, this is of interest for two reasons. First, efficiency theories predict that heavier regulation of labor markets should be associated with better, and certainly not worse, labor market outcomes. This prediction has been contradicted by a variety of empirical studies from Lazear (1990) to Besley and Burgess (2002), and here we confirm their findings. Second, if the regulation of labor is damaging at least to some workers, then who benefits from it? Put differently, is there political support for the heavier regulation of labor, or does legal origin simply provide a

politically unsupported “technology” for the social control of labor markets? Since, as we have already shown, more leftist governments in French civil law countries regulate labor markets more heavily, we expect to find some beneficiaries of such regulation.

We look at several potential consequences of labor regulation. These include the size of and the employment in the unofficial economy, male and female participation in the labor force, and unemployment computed separately for everyone, and for male and female workers aged 20-24. In addition, as a crude measure of relative wages of protected and unprotected workers, we consider the average wage of machine operators relative to that of clerks and workers in craft and related trades. All of these variables have related measurement problems, particularly for the developing countries, where some employment is informal and is not recorded in official statistics. Still, by looking at the various dimensions of the data, we hope to get a general picture.

The results in Table XIII are consistent across specifications and reveal no evidence that the regulation of labor is beneficial. An increase of the employment laws index by 1 point (from New Zealand to Spain) raises the share of the unofficial economy in GDP by 6.72 percentage points, the share of unofficial employment by 13.74 percentage points, and reduces labor force participation of men and women by about 3 percentage points. It also raises the average unemployment rate by nearly 3 percentage points, and that of young men by over 6 and young women by nearly 10 percentage points. The adverse effects of regulation are only slightly weaker for industrial relations laws, but are generally insignificant for social security laws.

In addition to the especially large effects of the regulation of labor on the unofficial economy and the unemployment of the young, Table XIII shows that heavier regulation is also associated with higher wages of machine operators relative to those of clerks. These results suggest indirectly that the older workers, employed in official sector and protected by the law,

are the likely beneficiaries of regulation. The costs of the regulation are borne disproportionately by the younger workers, and those employed in the unofficial economy. The heavier regulation of labor thus has its own political base: the older and better protected workers, a finding broadly consistent with other research in labor economics (Blanchflower and Freeman 2000).

Table XIV addresses the concern that labor laws are endogenous, and presents instrumental variables regressions using legal origins as instruments. With the exception of the results on the informal economy, which lose significance, the effect of employment laws on outcomes becomes stronger. The fact that the exogenous component of labor laws reduces labor force participation and raises unemployment is strong evidence against the efficiency theory.

The results on outcomes point to a possible role of politics in shaping the patterns of labor regulation. It remains the case that the most pervasive determinant of these patterns is the origin of a country's laws. But employment protection and industrial relations laws also appear to affect different classes of workers differently, and as such may create a basis of political support for the politicians who expand them. Our finding that leftist parties in French civil law countries introduce more protective labor laws is consistent with this interpretation.

## **VII. Conclusion**

There are three broad theories of government regulation of labor. Efficiency theories hold that regulations adjust to most efficiently address the problems of market failure. Political theories hold that regulations are used by the political leaders to benefit themselves and their allies. Legal theories hold that the patterns of regulation are shaped by each country's legal

tradition, which is to a significant extent determined by transplantation of a few legal systems. We examined the regulation of labor markets in 85 countries through the lens of these theories.

The evidence is inconsistent with the efficiency theory since, contrary to its predictions, poor countries regulate labor markets more than rich countries do, social security is not a substitute for labor regulation, and such regulation has adverse consequences for unemployment, labor force participation, and economic activity staying official. The evidence is also inconsistent with a basic version of the political theory, which sees heavier regulation of labor as a reflection of the political power of the left through either elected office or labor unions. Although our measures of the power of the left, as well as our measures of political and economic constraints on government, influence the patterns of regulation of labor, these effects disappear once we control for the basic regulatory style determined by the legal tradition. Finally, the evidence is broadly consistent with the legal theory, according to which patterns of regulation across countries are shaped largely by their legal structure, which arrived to most countries through transplantation of legal systems.

These results do not mean that efficiency forces in regulation are unimportant, and indeed our focus on labor markets and on a large sample of developing countries, which inherited their regulatory styles, predisposes our findings against supporting the efficiency hypothesis. These findings also do not mean that politics is unimportant, except to the extent that they reject the view that civil law is nothing but a reflection of “social democracy”. Indeed, we show that politics do influence the intensity of labor market regulation in French civil law countries, where the basic regulatory style is vulnerable to political pressures. We also present some indirect evidence that the older workers, and those more likely to be covered by the laws, are the likely

beneficiaries, and hence political supporters, of labor regulation. But politics plays the second fiddle; the main determinant of the regulatory style is the historical origin of a country's laws.

This finding echoes our earlier results on the regulation of entry and on the formalism of judicial procedures. These findings also showed that countries from different legal origins rely on different institutional technologies for social control of business. A key result in the present paper is the high correlation among our measures of regulation of different activities across countries: countries that regulate entry also regulate labor markets and judicial proceedings. The bottom line of this research is the centrality of institutional transplantation: countries have regulatory styles that are pervasive across activities and shaped by the origin of their laws.

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**Table I**  
**Description of the variables**

The table describes the variables in the paper. Unless otherwise specified, the sources for the variables are the laws of each country.

Variable	Description
<i>Employment laws</i>	
<i>Alternative employment contracts</i>	
Part-time employment is prohibited	We define a ' <i>part-time worker</i> ' as any employee working 20 hours per week. It includes people working 4 hours per day 5 days per week, and people working full time two and a half days per week. The second case is frequently known as a ' <i>temporary worker</i> '. This variable equals one if part-time employment is prohibited by the labor laws. Equals zero if part-time work is expressly allowed or if labor laws are silent thereon.
Part-time workers are not exempt from mandatory benefits of full-time workers	Equals one if a part-time worker working half the time of a full-time worker enjoys at least half of the benefits enjoyed by the full-time worker. The variable is also equal to one if part-time employment is prohibited by the labor laws. The variable equals zero if part-time workers are not entitled to: (i) at least half of the maximum hours of work, leaves, and overtime premiums; (ii) social security coverage (pensions, health, unemployment); or (iii) if there are entitlement thresholds of more than half the legally mandated regular work week for premiums, leaves, or social security coverage. In countries where there are minimum-earnings thresholds to obtain benefits (rather than time-based thresholds), the analysis is done considering a salary equal to half of the country's GNP per worker.
It is not easier or less costly to terminate part-time workers than full-time workers	Equals one if part-time workers working half time enjoy at least half of the legal rights to advance notice and separation fees for the termination of the employment contract of full time workers. Equals zero otherwise.
Part-time contracts	Measures the protection of part-time workers in the labor law as the average of the preceding three variables.
Fixed-term contracts are only allowed for fixed-term tasks	The term ' <i>fixed-term contract</i> ' refers to workers employed for fixed periods of weeks, months, or years. In many countries a person working for two or three days per week is considered a fixed-term, rather than a part-time, worker. This variable equals one if fixed-term contracts are allowed only: (i) for jobs that are temporary by nature; (ii) for temporary vacancies to replace a permanent worker in maternity or sickness leave; (iii) for training contracts; (iv) for seasonal work; and/or (v) if the law expressly states that the will of the parties involved in the contract is not a good enough reason for entering into a fixed-term contract. Equals zero otherwise.
Maximum duration of fixed-term contracts.	Measures the maximum cumulative duration of fixed-term contracts. The variable is normalized from 0 to 1, where higher values mean lower allowed duration of fixed-term contracts (higher protection). If there is no legally mandated ceiling or if fixed-term contracts may be renewed without limit, the variable equals zero. The highest observation in our sample is 96 months and the lowest observation is 0 months.
Fixed-term contracts	Measures the protection of workers through limits set in the use of fixed-term contracts as the average of the preceding two variables.
The employment of family members is not exempt from any aspect of the labor law	Equals one if the employment of family members enjoys the protection of labor law, or if labor law is silent regarding family members' employment. Equals zero if the employment of family members is not subject to maximum hours of work, leaves, overtime premiums, advance notice and severance payment, social security coverage, or non-salary benefits. This variable is coded without regard to our assumption on firm size.
Subindex: Alternative employment contracts	Measures whether the law allows alternatives to the standard employment contract as the average score of: (i) part-time contracts; (ii) fixed-term contracts; and (iii) the employment of family members is not exempt from any aspect of the labor law.
<i>Conditions of employment</i>	
Mandatory minimum daily rest	Measures the mandatory minimum daily rest. This variable is normalized from 0 to 1, where higher values mean higher duration of mandatory daily rest (higher protection). If there is no legally mandated ceiling, the variable equals zero. Legal limits may be defined either as mandatory minimum rest hours per day, or as mandatory maximum regular and overtime working hours per day. For the latter case, we subtract this number from 24 hours in a day to obtain the equivalent of the minimum of rest hours per day. The highest observation in our sample is 14 hours and the lowest observation is 5 hours, excluding the countries that have no limit.

Variable	Description
Maximum number of hours in a regular work week	Measures the maximum duration of the regular work week (excluding overtime). This variable is normalized from 0 to 1, where higher values mean less hours of work (higher protection). If there is no legally mandated limit, the variable equals zero. The highest observation in our sample is 52 hours and the lowest observation is 37 hours.
Premium for overtime work	Measures the premium for overtime work, as defined by the law or mandatory collective agreement. This variable is normalized from 0 to 1, where higher values mean higher premium (higher protection). If the law provides for a variable schedule of overtime premium, we code the basic premium for the first hour of overtime. The highest observation in our sample is 100% and the lowest observation is 0%.
There are restrictions on night work	Equals one if by law or mandatory collective agreement: (i) there are restrictions on the maximum number of hours of work that can be performed at night; and/or (ii) if there are specific premiums for night-time work. Equals zero if night-time work is not subject to express limitations, i.e., if it is only subject to the general restrictions on the maximum length of the work day or work week, and the regular overtime premium. To code this variable we only consider specific regulations of night-time work and ignore regulations of work-shifts.
There are restrictions on "weekly holiday" work	Equals one if by law or mandatory collective agreement there are restrictions on work during the weekly holiday (Friday, Saturday, or Sunday, depending on the country). Restrictions include: (i) complete prohibition; (ii) express designation of a certain day of the week as weekly holiday, which the employer cannot change without workers' consent; (iii) specific maximum hours of work on such day; and (iv) special premiums for work on such day. Equals zero if work during the weekly holiday is: (i) allowed without restriction; or (ii) is only subject to the general limitations on the maximum length of the work week or work day and does not entail higher than regular overtime premiums.
Hours of work	Measures the protection of the regulation of hours of work as the average of the preceding five variables.
Days of annual leave with pay in manufacturing	Measures the length of the annual paid leave in manufacturing after twenty years of employment. This variable is normalized from 0 to 1, where higher values mean longer annual paid leave (higher protection). Equals zero if there is no minimum by law or mandatory collective agreement. If annual leave entails less than full pay, the number of days are discounted proportionally. The highest observation in our sample is 30 days and the lowest is 0 days. We assume that 7 calendar days equal 5 working days.
Paid time-off for holidays is mandatory	Equals one if workers are granted paid time off for national or local holidays by law or mandatory collective agreement. Equals zero otherwise.
Statutory duration of maternity leave with 100% earnings	Measures the length of the statutory duration of maternity leave for normal delivery/birth of a normal child with 100% of earnings. The variable is normalized from 0 to 1, where higher values mean longer maternity leave (higher protection). Equals zero if maternity leave is unpaid. If payment is less than 100%, time is reduced proportionally. The highest observation in our sample is 12 months and the lowest observation is 0 months. Source: <i>ILO, Conditions of Work Digest, 1994</i> .
Leaves	Measures the protection of the regulation on leaves of absence as the average of the preceding three variables.
Mandatory minimum wage	Equals one if there is a mandatory minimum wage by law or mandatory collective agreement, and zero otherwise.
Conditions of employment in the constitution	Measures the degree to which the regulation of conditions of employment appears in the country's constitution. Equals one if a right to certain minimum conditions of employment is expressly granted by the constitution. Equals 0.67 if the minimum conditions of employment are described as a matter of public policy or public interest in the constitution (or mentioned within the chapter on rights). Equals 0.33 if conditions of employment are otherwise mentioned in the constitution. Equals zero otherwise.
Subindex: Conditions of employment	Measures the protection in the law of conditions of employment as the average of: (i) hours of work; (ii) leaves; (iii) mandatory minimum wage; and (iv) conditions of employment in the constitution.

Variable	Description
<i>Job security</i>	
It is unfair to terminate the employment contract without cause	Measures the parties' leeway to agree on the conditions of termination of the employment contract. Equals one: (i) if the employer may not terminate the employment contract without cause; (ii) if the termination without cause always entails a mandatory penalty; or (iii) if the law bans the parties to enter into employment contracts that may be terminated by either party entirely at will or with a simple advance notice without any mandatory penalty. Equals zero otherwise.
The law establishes a public policy list of "fair" grounds for dismissal	Equals one if the law establishes a public policy list of "fair" grounds for dismissal. Equals zero if there is no list of grounds for dismissal or if parties are allowed to contract out.
Redundancy is not considered a "fair" ground for dismissal	Equals one if redundancy (also known as retrenchment, termination for economic reasons, necessities of the company, or objective causes) is not considered a "fair" ground for dismissal by law, or if such dismissal always entails a mandatory penalty. Equals zero otherwise.
Protection of grounds for dismissal	Measures the protection of the rules on grounds for dismissal as the average of the preceding three variables.
The employer must notify a third party before dismissing a redundant employee	Equals one if, by law or mandatory collective agreement, the employer must notify a third party (labor union, workers' council or government agency) before dismissing a redundant worker. Equals zero if the employer may dismiss a worker without notifying a third party, or if the employer may contract out of the prohibition.
The employer needs the approval of a third party to dismiss a redundant worker	Equals one if, by law or mandatory collective agreement, the employer needs the approval of a third party (labor union, workers' council or government agency) to dismiss a redundant worker. Equals zero if the employer may dismiss a worker without the approval of a third party, or if the employer may contract out of the prohibition.
The employer must notify a third party prior to a collective dismissal	Equals one if, by law or mandatory collective agreement, the employer must notify a third party (labor union, workers' council, government agency) before dismissing more than one worker. Equals zero if the employer may dismiss more than one worker without notifying a third party, or if the employer may contract out of the prohibition.
The employer needs the approval of a third party prior to a collective dismissal	Equals one if, by law or mandatory collective agreement, the employer needs the approval of a third party (labor union, workers' council or government agency) prior to a collective (more than one worker) dismissal. Equals zero if the employer may dismiss more than one worker without third party approval, or if the employer may contract out of the prohibition.
The law mandates retraining or replacement prior to dismissal	Equals one if, by law or mandatory collective agreement, the employer must provide relocation or retraining alternatives for redundant employees prior to dismissal. Equals zero otherwise.
There are priority rules applying to dismissal or lay-offs	Equals one if, by law or mandatory collective agreement, there are priority rules applying to dismissal or lay-offs, i.e., in order to fire redundant employees, the employer must follow a specific order of seniority, marital status, number of dependants or other objective priority criteria. Equals zero otherwise.
There are priority rules applying to re-employment	Equals one if, by law or mandatory collective agreement, there are priority rules applying to re-employment. Equals zero if former redundant employees need not be considered for new positions (i.e. there are no priority rules for re-employment).
Protection of dismissal procedures	Measures the protection of collective dismissal procedures as the average of the preceding seven variables.
Legally mandated notice period	Measures the length of the mandatory notice period for the dismissal of one redundant worker in manufacturing after twenty years of employment. The variable is normalized from 0 to 1, where higher values mean longer notice (higher protection). Equals zero if there is no minimum notice period by law. The highest observation in our sample is 24 weeks and the lowest is 0 weeks.
Legally mandated severance payment	Measures the amount of mandatory severance payment (including mandatory indemnity) for the dismissal of one redundant worker after twenty years of employment in manufacturing. The variable is normalized from 0 to 1, where higher values mean higher amounts (higher protection). Equals zero if there is no severance payment by law. The highest observation in our sample is 28.5 months and the lowest is 0 months.
Notice and severance payment	Measures the protection of the notice period and the severance payment for the unilateral termination of the employment contract by the employer. This partial subindex is calculated as the average of the preceding two variables.

Variable	Description
Right to job security in the constitution	Measures the presence of rules on termination of the employment contract in the country's constitution. Equals one if a right to job security or to the stability in the employment relation is expressly granted by the constitution. Equals 0.67 if job security is described as a matter of public policy or public interest (or mentioned within the chapter on rights). Equals 0.33 if job security is otherwise mentioned in the constitution. Equals zero otherwise.
Subindex: Job security	Measures the protection of the rules governing the termination of the employment contract as the average of: (i) protection of grounds for dismissal; (ii) protection of dismissal procedures; (iii) notice and severance payment; and (iv) right to job security in the constitution.
Index: Employment laws	Measures the protection of labor and employment laws as the aggregate sum of the: (i) subindex of alternative employment contracts; (ii) subindex of conditions of employment; and (iii) subindex of job security.
<i>Industrial (collective) relations laws</i>	
<i>Collective bargaining</i>	
Employers have the legal duty to bargain with unions	Equals one if employers have the legal duty to bargain and/or to reach an agreement with unions, workers councils or other organizations of workers. Equals zero if employers may lawfully refuse to bargain with workers. The variable only measures the duty to bargain, as opposed to the duty to bargain in good faith.
Collective contracts are extended to third parties by law	Equals one if the law extends collective contracts to third parties at the national or sectoral level. Extensions may be automatic or subject to governmental approval. Equals zero if collective contracts may not be extended to non-signatory workers or unions, or if collective contracts may be extended only at the plant level. Mandatory administrative extensions of collective contracts are coded as equivalent to mandatory extensions by law.
Law allows closed shops	Equals one if the law allows closed shops, and zero otherwise. Closed shops are agreements providing for mandatory union membership, which are binding on non-signatory and new employees. Union security legislation in general includes the following measures: (1) pre-entry closed shops, where workers have to belong to a union prior to taking up a job; (2) post-entry closed shops (or union shops), where workers are forced to join a union after taking up a job; and (3) absolute preferences, where an employer has to give a job to a union member if equally qualified to another non-union candidate. We do not consider post-entry closed shops.
Labor union power	Measures the statutory protection of unions as the average of the preceding three variables.
Right to unionization in the constitution	Measures the protection of the right to form labor unions in the country's constitution. Equals one if a right to form labor unions is expressly granted by the constitution. Equals 0.67 if labor unions are described as a matter of public policy or public interest (or mentioned within the chapter on rights). Equals 0.33 if labor unions are otherwise mentioned in the constitution. Equals zero otherwise.
Right to collective bargaining in the constitution	Measures the protection of the right to collective bargaining or the right to enter into collective labor contracts in the country's constitution. Equals one if a right to collective bargaining is expressly granted by the constitution. Equals 0.67 if collective bargaining is described as a matter of public policy or public interest (or mentioned within the chapter on rights). Equals 0.33 if collective bargaining is otherwise mentioned in the constitution. Equals zero otherwise.
Subindex: Collective bargaining	Measures the legal protection of the right to unionization and collective bargaining as the average of: (i) labor union power; (ii) right to unionization in the constitution; and (iii) right to collective bargaining in the constitution.
<i>Worker participation in management</i>	

Variable	Description
Workers and/or unions have a right to appoint members to the boards of directors	Equals one if the law gives workers and/or unions the right to appoint members to the Boards of Directors of individual companies, and zero otherwise. This arrangement is usually associated with the “German” model of co-determination.
Workers councils are mandated by law	Equals one if workers councils, committees or equivalent bodies are mandated by law. Equals zero if workers councils are not regulated by law or if their creation is voluntary for the employer. Workers councils are institutions of employers and workers created for the discussion of company’s policies affecting workers at the company level. This arrangement is sometimes called the “Swedish” model. The employer still has the sole right to decide on the operations of the company, but must negotiate and decide all matters affecting workers within the framework of workers councils.
Worker participation by law	Measures the statutory rights of workers to participate in the management of the companies as the average of the preceding two variables.
Right to participation in management in the constitution	Measures the protection of the workers' right to participation in management in the country's constitution. Equals one if a right to participation in management is expressly granted by the constitution. Equals 0.67 if participation in management is described as a matter of public policy or public interest (or mentioned within the chapter on rights). Equals 0.33 if participation in management is otherwise mentioned in the constitution. Equals zero otherwise.
Subindex: Worker participation in management	Measures the legal rights of workers to participate in the management of companies as the average of: (i) worker participation by law; and (ii) right to worker participation in management in the constitution.
<i>Collective disputes</i>	
Workers have the right to strike	Equals one if the laws grant workers the right or the freedom to strike, and zero otherwise.
Wildcat strikes are legal	Equals one if wildcat strikes are legal, and zero otherwise. Wildcat strikes are strikes not authorized by the labor union or the assembly of workers.
Political strikes are legal	Equals one if political strikes are legal, and zero otherwise. Political strikes are defined as strikes for political reasons or to protest government's policy, i.e., non work-related issues.
Sympathy / solidarity / secondary strikes are legal	Equals one if the law allows sympathy, solidarity or secondary strikes used to force decisions affecting workers other than those joining the strike, and zero otherwise. Sympathy or solidarity strikes are strikes by union members or workers who have no grievances against their employer, but who want to show solidarity with another union or workers. Secondary strikes are those against another employer who has business dealings with the employer involved in a dispute with the union or workers.
Legal strikes	Measures the protection of the right to strike in the law as the average of the preceding four variables.
No mandatory waiting period or notification requirement before strikes can occur	Equals one if by law there is no mandatory waiting period or notification requirement before strikes can occur, and zero otherwise.
A strike is not illegal even if there is a collective agreement in force	Equals one if a strike is not illegal even if there is a collective agreement in force, and zero otherwise.
Laws do not mandate conciliation procedures before a strike	Equals one if laws do not mandate conciliation procedures or other alternative-dispute-resolution mechanisms (other than binding arbitration) before the strike, and zero otherwise.
Procedural restrictions to strikes	Measures the absence of procedural restrictions to the right to strike in the law as the average of the preceding three variables.
Employer lockouts are not allowed	Equals one if employers' lockouts (strikes by employers) are not allowed, and zero otherwise. Lockouts may be offensive (when they are not provoked by workers) or defensive.

Variable	Description
Employers are not allowed to fire or replace striking workers	Equals one if the law prohibits employers to fire striking workers or to hire replacement labor to maintain the plant in operation during a non-violent and non-political strike. Equals zero otherwise.
Employer defenses	Measures the powers of employers during a collective dispute as the average of the preceding two variables.
Compulsory third party arbitration during a labor dispute is mandated by law	Equals one if the parties to a labor dispute are legally required to seek third party arbitration or the government is always entitled to impose compulsory arbitration on them. Equals zero otherwise. The term 'compulsory arbitration' refers to arbitration of private disputes against the will of the parties. It may protect workers by granting them an alternative to costly strikes in case of deadlocks in the negotiation process, but it may also limit the workers' right to strike.
Right to industrial action in the constitution	Measures the protection of the right to industrial action (i.e. strike, go-slow or work-to-rule) in the country's constitution. It equals one a right to industrial action is expressly granted by the constitution. Equals 0.67 if strikes are described as a matter of public policy or public interest (or mentioned within the chapter on rights). Equals 0.33 if strikes are otherwise mentioned in the constitution. Equals zero otherwise.
Subindex: Collective disputes	Measures the protection of workers during a collective dispute as the average of: (i) legal strikes; (ii) procedural restrictions to strikes; (iii) employer defenses; (iv) compulsory third party arbitration during a labor dispute; and (v) right to industrial action in the constitution.
Index: Industrial (collective) relations laws	Measures the protection of industrial (collective) relations laws as the sum of the: (i) subindex of collective bargaining; (ii) subindex of worker participation in management; and (iii) subindex of collective disputes.
<i>Social security laws</i>	
<i>Old age, disability and death benefits</i>	
The Social Security system covers the risk of old age, disability and death	Equals one if the social security system covers the risk of old age, disability and death, and zero otherwise.
Difference between retirement age and life expectancy	Measures the difference between the minimum legal age for normal retirement and the country's life expectancy at birth. This variable is normalized from 0 to 1, where higher values mean higher post-retirement life expectancy (higher protection). Normal retirement is the legally defined age for retirement with standard pension, and it excludes voluntary early or late retirement schemes. Equals zero if life expectancy is lower than retirement age. The highest observation in our sample is 23.8 years and the lowest is 0 years. Source: constructed using data from the laws of each country and the <i>Human Development Report, 1997</i> .
Months of contributions or employment required for normal retirement by law	Measures the number of months of contributions or employment legally required for normal retirement. The variable is normalized from 0 to 1, where higher values mean less contribution (higher protection). The highest observation in our sample is 540 months and the lowest is 0 months. Normal retirement is the legally defined age for retirement with standard pension, and it excludes voluntary early or late retirement schemes. If the law requires the worker to have a combination of certain number of months of work and a different number of months of contributions, we use the higher of the two figures since this is the one that is binding. Lump-sum and private pension systems do not define the number of months of contributions for normal retirement by law. In such cases, the amount of the pension solely depends on the number of months of contributions, thus we assume twenty years of contributions for normal retirement.
Percentage of the worker's monthly salary deducted by law to cover old-age and disability benefits	Measures the share of the worker's monthly salary deducted by law to cover old-age, disability, and death benefits. The variable is normalized from 0 to 1, where higher values mean lower deductions (higher protection). If the risk of disability and death is not included in the contribution for old-age pension, we add the individual components. The highest observation in our sample is 20% and the lowest is 0%. In some countries the social security contribution for old age, disability and death benefits also covers sickness and health benefits and/or unemployment benefits. In such cases, we calculate the share of contributions for each benefit for the average country in our sample, and apportion the total contribution among the several risks covered accordingly.

Variable	Description
Percentage of the pre-retirement salary covered by the old-age cash-benefit pension	This variable is the equivalent to the "replacement rate", which is the percentage of the pre-retirement salary covered by the average old-age cash-benefit pension. The variable is normalized from 0 to 1, where higher values mean higher percentage (higher protection). The highest observation in our sample is 90% and the lowest is 0%. For the countries that provide workers more than 12 pension payments a year, we add up the amount of all the payments and divided the total by 12 to get the equivalent "monthly" cash benefit pension. Where the pension plan provided for fixed monthly payments, rather than a percentage, the replacement rate is calculated using a pre-retirement salary equal to the country's GNP per worker. For lump-sum systems, where at the time of retirement a one-time payment is made equal to the worker's contributions plus accrued interest, the monthly old-age cash-benefit pension is calculated using the lump-sum payment divided by the difference between the average life expectancy and retirement age in months. As in the case of fixed monthly payment systems, the pre-retirement salary is calculated to be equal to the country's GNP per worker. The interest used in the calculation is the average monthly Libor rate over the previous ten years. The same methodology as in the lump-sum systems is applied to the private pension systems. If there are more than 12 pension payments per year we adjust the percentage accordingly.
Subindex: Old age, disability and death benefits	Measures the level of old age, disability and death benefits as the average of the preceding four variables.
<i>Sickness and health benefits</i>	
The social security system covers the risk of sickness	Equals one if the social security system covers the risk of sickness and zero otherwise.
Months of contributions or employment required to qualify for sickness benefits by law	Measures the number of months of contributions or employment legally required to qualify for sickness benefits. The variable is normalized from 0 to 1, where higher values mean less contribution (higher protection). If the law requires the worker to have a combination of certain number of months of work and a different number of months of contributions, we use the higher of the two figures since this is the one that is binding. The highest observation in our sample is 12 months and the lowest is 0 months.
Percentage of the worker's monthly salary deducted by law to cover sickness and health benefits	Measures the share of the worker's monthly salary deducted by law to cover sickness and health benefits. The variable is normalized from 0 to 1, where higher values mean lower deductions (higher protection). If the risks of sickness and health demand separate contributions, we add the individual components. The highest observation in our sample is 11.8% and the lowest observation is 0%. In some countries the social security contribution for old age, disability and death benefits also covers sickness and health benefits and/or unemployment benefits. In such cases, we calculate the share of contributions for each benefit for the average country in our sample, and apportion the total contribution among the several risks covered accordingly.
Waiting period for sickness benefits	Measures the waiting period for obtaining sickness cash benefits from the first day of sickness. The variable is normalized from 0 to 1, where higher values mean lower waiting periods (higher protection). The waiting period is the number of days before a person is legally entitled to receive sickness benefits. The highest observation in our sample is 42 days and the lowest observation is 0 days.
Percentage of the salary covered by sickness cash benefits for a two-month sickness spell	Measures the percentage of the salary covered by the average sickness cash benefit for a two-month sickness spell. The variable is normalized from 0 to 1, where higher values mean higher percentage of salary covered (higher protection). If sickness benefits last less than 2 months, the percentage of the salary by sickness benefits is discounted proportionally. The highest observation in our sample is 100% and the lowest observation is 0%. Sickness cash benefits are defined in some countries as a fixed amount in local currency, rather than as a percentage. In such cases, the percentage of the salary covered is calculated based on a salary equal to the country's GNP per worker.
Subindex: Sickness and health benefits	Measures the level of sickness and health benefit as the average of the preceding four variables.
<i>Unemployment benefits</i>	
The Social Security system covers the risk of unemployment	Equals one if the social security system covers the risk of unemployment, and zero otherwise.
Months of contributions or employment required to qualify for unemployment benefits by law	Measures the number of months of contributions or employment legally required to qualify for unemployment benefits. The variable is normalized from 0 to 1, where higher values mean less contribution (higher protection). If the law requires the worker to have a combination of certain number of months of work and a different number of months of contributions, we use the higher of the two figures since this is the one that is binding. The highest observation in our sample is 120 months and the lowest observation is 0 months.

Variable	Description
Percentage of the worker's monthly salary deducted by law to cover unemployment benefits	Measures the share of the worker's monthly salary deducted by law to cover unemployment benefits. The variable is normalized from 0 to 1, where higher values mean lower deductions (higher protection). The highest observation in our sample is 6.1% and the lowest observation is 0%. In some countries the social security contribution for old age, disability and death benefits also covers sickness and health benefits and/or unemployment benefits. In such cases, we calculate the share of contributions for each benefit for the average country in our sample, and apportion the total contribution among the several risks covered.
Waiting period for unemployment benefits	Measures the waiting period for obtaining unemployment benefits from the first day of unemployment. The variable is normalized from 0 to 1, where higher values mean lower waiting periods (higher protection). The waiting period is the number of days before a person is legally entitled to receive unemployment benefits. The highest observation in our sample is 70 days and the lowest observation is 0 days.
Percentage of the salary covered by unemployment benefits in case of a one-year unemployment spell	Measures the percentage of the salary covered by unemployment benefits for in case of a one-year unemployment spell. The variable is normalized from 0 to 1, where higher values mean higher percentage of salary (higher protection). If the maximum the duration of benefits is less than one year, the percentage of the annual salary is discounted proportionally. The highest observation in our sample is 90% and the lowest observation is 2.78%. Unemployment benefits are defined in some countries as a fixed amount in local currency, rather than as a percentage. In such cases, the percentage of the salary covered is calculated based on a salary equal to the country's GNP per worker.
Subindex: Unemployment benefits	Measures the level of unemployment benefits as the average of the preceding four variables.
Average of dummies on coverage of old age, sickness and unemployment	Equals the average of the three dummy variables for the existence of coverage, namely: (i) social security system covers the risk of old age, disability and death; (ii) social security system covers the risk of sickness and health; and (iii) social security system covers the risk of unemployment.
Index: Social security laws	Measures social security benefits as the sum of the: (i) subindex of old age, disability and death benefits; (ii) subindex of sickness and health benefits; and (iii) subindex of unemployment benefits.

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*Left power*

Chief Executive's party has left or center political orientation	Measures the percentage of years between 1975 and 1995 during which the party of the country's chief executive had left or center orientation. If the country was not independent in the initial year of the period, we calculate the variable for the number of years since it became independent. For the countries that were part of a larger country in the initial year of the period and subsequently broke-up, we consider the political orientation of the larger country until the breakup. In the case of military regimes, where political affiliations are unclear, we classify the regime based on its policies. Source: <i>Authors' calculations based on descriptions and classifications in: Political Handbook of the World, Europa Yearbook, Statesmen database</i> < <a href="http://www.worldstatesmen.org">http://www.worldstatesmen.org</a> >, <i>Country Reports History</i> < <a href="http://www.countryreports.org">http://www.countryreports.org</a> >, Beck, Clarke, Groff, Keefer and Walsh [2001], various regional and country sources.
Largest party in congress has left or center political orientation	Measures the percentage of years between 1975 and 1995 during which the largest party in congress had left or center orientation. If the country was not independent in the initial year of the period, we calculate the variable for the number of years since it became independent. For the countries that were part of a larger country in the initial year of the period and subsequently broke-up, we consider the political orientation of the larger country until the breakup. In the case of military regimes, where political affiliations are unclear, we classify the regime based on its policies. Source: <i>Authors' calculations based on descriptions and classifications in: Political Handbook of the World, Europa Yearbook, Statesmen database</i> < <a href="http://www.worldstatesmen.org">http://www.worldstatesmen.org</a> >, <i>Country Reports History</i> < <a href="http://www.countryreports.org">http://www.countryreports.org</a> >, Beck, Clarke, Groff, Keefer and Walsh [2001], various regional and country sources.

Variable	Description
Chief Executive and largest party in congress have left or center political orientation	Measures the percentage of years between 1975 and 1995 during which both the party of the chief executive and the largest party in congress had left or center orientation. If the country was not independent in the initial year of the period, we calculate the variable for the number of years since it became independent. For the countries that were part of a larger country in the initial year of the period and subsequently broke-up, we consider the political orientation of the larger country until the breakup. In the case of military regimes, where political affiliations are unclear, we classify the regime based on its policies. Source: <i>Authors' calculations based on descriptions and classifications in: Political Handbook of the World, Europa Yearbook, Statesmen database</i> < <a href="http://www.worldstatesmen.org">http://www.worldstatesmen.org</a> >, <i>Country Reports History</i> < <a href="http://www.countryreports.org">http://www.countryreports.org</a> >, <i>Beck, Clarke, Groff, Keefer and Walsh [2001]</i> , various regional and country sources.
Union density	Measures the percentage of the total work force affiliated to labor unions. Source: <i>ILO, Laborsta</i> < <a href="http://laborsta.ilo.org">http://laborsta.ilo.org</a> >, and <i>The World Bank</i> .
Percentage of the labor force covered by collective agreements	Measures the percentage of the total labor force covered by collective agreements. Source: <i>ILO, Laborsta</i> < <a href="http://laborsta.ilo.org">http://laborsta.ilo.org</a> >, and <i>The World Bank</i> .
<i>Political and economic constrains</i>	
Constraints on executive power	Index of constraints on the executive power based on the number of effective veto points in a country. Veto points include: (i) an effective legislature (represents two veto points in the case of bicameral systems); (ii) an independent judiciary; and (iii) a strong federal system. Average of the years 1945 through 1998. Source: <i>Henisz [2000]</i> .
Effectiveness of legislature	Index of the effectiveness of the legislature. Ascending scale from 1 to 4 (1=no legislature; 2=largely ineffective; 3=partly effective; 4=effective). Average of the years 1945 through 1998. Source: <i>The Cross-National Time-Series Data Archive</i> < <a href="http://www.databanks.sitesting.net/www/main.htm">http://www.databanks.sitesting.net/www/main.htm</a> >.
Autocracy	The "general closedness of political institutions." Scale from 0 to 10, with 0 being low in autocracy and 10 being high in autocracy. Average of the years 1945 through 1998. Source: <i>Jagers and Marshall, [2000]</i> .
Actual openness	Trade share as a proportion of GDP in 1985 calculated using bilateral trade data. Source: <i>Frankel and Romer [1999]</i> .
Geographic openness	Trade share as a proportion of GDP in 1985 calculated using bilateral trade data and adjusted by the geographic component of each country's overall trade share. The geographic component of a country's trade is the sum of the estimated geographic components of its bilateral trade with the rest of the countries in the world. Source: <i>Frankel and Romer [1999]</i> .
Factor accumulation openness	Trade share as a proportion of GDP in 1985 calculated using bilateral trade data and adjusted by the country's rates of factor accumulation. Source: <i>Frankel and Romer [1999]</i> .
<i>Outcomes</i>	
Size of the unofficial economy	Size of the shadow economy as a percentage of GDP (varying time periods). Source: <i>Authors' calculations based on averaging all estimates reported in Schneider and Enste (2000) for any given country, as well as Sananikone [1996] for Burkina Faso, Chidzero [1996] for Senegal, Turnham and Schwartz [1990] for Indonesia and Pakistan, and Kasnakoglu and Yayla [2000] for Turkey.</i>
Employment in the unofficial economy	Share of the total labor force employed in the unofficial economy in the capital city of each country as a percent of the official labor force. Figures are based on surveys and, for some countries, on econometric estimates. Source: <i>Schneider [2000] and the Global Urban Indicators Database [2000]</i> < <a href="http://www.urbanobservatory.org/indicators/database">http://www.urbanobservatory.org/indicators/database</a> >.
Male participation rate in the labor force 1990-1994	Male participation rate as a percentage of the total male population aged 15 to 64. Based on population censuses or household surveys. Source: <i>Forteza and Rama [2000]</i> .
Female participation rate in the labor force 1990-1994	Female participation rate as a percentage of the total female population aged 15 to 64. Based on population censuses or household surveys. Source: <i>Forteza and Rama [2000]</i> .
Unemployment rate 1991-2000	Average unemployment rate as a percentage of the total labor force during 1991-2000. Source: <i>Laborsta</i> < <a href="http://laborsta.ilo.org">http://laborsta.ilo.org</a> >.

Variable	Description
Unemployed males 20-24 years old / active males 20-24 years old 1991-2000	Unemployed males aged 20 to 24 as a percentage of the total active male population of the same age during 1991-2000 period. Source: <i>Laborsta</i> < <a href="http://laborsta.ilo.org">http://laborsta.ilo.org</a> >.
Unemployed females 20-24 years old / active females 20-24 years old 1991-2000	Unemployed females aged 20 to 24 as a percentage of the total active female population of the same age during 1991-2000. Source: <i>Laborsta</i> < <a href="http://laborsta.ilo.org">http://laborsta.ilo.org</a> >.
Average wages of machine operators / wages of clerks and workers in craft and related trades 1990-1999	Average wages of machine operators across industries over those of clerks and workers in craft and related trades for the period 1990 to 1999. We use all 12 types of machine operators in the database including: (1) cloth weaver, (2) sewing-machine operator, (3) clicker cutter, (4) shoe sewer, (5) paper-making-machine operator, (6) machine compositor, (7) bookbinder, (8) mixing- and blending-machine operator (manufacture of industrial chemicals), (9) mixing- and blending-machine operator (manufacture of other chemical products), (10) metal-working machine setter, (11) machinery fitter-assembler and (12) card- and tape-punching-machine operator. The clerks and workers in craft and related trades we use are: (1) butcher, (2) building electrician, (3) bricklayer, (4) automobile mechanic and (5) stenographic typist (wholesale trade). To construct the variable we: (1) calculate individual wage ratios for each pair of machine operators and workers in craft, related trades and clerks for each year; (2) average each of these ratios across the 1990-1999 period to obtain the average relative wages for each pair of professions during the decade; finally (3) calculate the country average across all pairs of professions where machine operators are always the numerator and workers in craft and related trades or clerks are the denominator. Source: <i>Freeman and Oostendorp [2000]</i> .
<i>Other Variables</i>	
Log of GNP per capita	Logarithm of GNP per capita in 1997, Atlas method, expressed in current US dollars. Source: <i>World Development Indicators</i> .
Legal origin	Identifies the legal origin of the company law or commercial code of each country (English, French, Socialist, German, Scandinavian). Source: <i>La Porta et al. [1999]</i> .
Court formalism index for the eviction of a non-paying tenant	The index measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts, and is formed by adding up the following indices: (i) professionals vs. laymen, (ii) written vs. oral elements, (iii) legal justification, (iv) statutory regulation of evidence, (v) control of superior review, (vi) engagement formalities, and (vii) independent procedural actions. The index ranges from 0 to 7, where 7 means a higher level of control or intervention in the judicial process. Source: <i>Djankov et al. [2003]</i> .
Court formalism index for the collection of a bounced check	The index measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts, and is formed by adding up the following indices: (i) professionals vs. laymen, (ii) written vs. oral elements, (iii) legal justification, (iv) statutory regulation of evidence, (v) control of superior review, (vi) engagement formalities, and (vii) independent procedural actions. The index ranges from 0 to 7, where 7 means a higher level of control or intervention in the judicial process. Source: <i>Djankov et al. [2003]</i> .
Ln number of steps to start a business	Logarithm of the number of different procedures that a start-up has to comply with in order to obtain a legal status, i.e. to start operating as a legal entity. Source: <i>Djankov et al. [2002]</i> .
Ln number of days to start a business	Logarithm of the time it takes to obtain legal status to operate a firm, in business days. A week has five business days and a month has twenty two. Source: <i>Djankov et al. [2002]</i> .
Ln cost to start a business / GDP per capita	Logarithm of the cost of obtaining legal status to operate a firm as a share of per capita GDP in 1999. It includes all identifiable official expenses (fees, costs of procedures and forms, photocopies, fiscal stamps, legal and notary charges, etc). The company is assumed to have a start-up capital of ten times per capita GDP in 1999. Source: <i>Djankov et al. [2002]</i> .

**Table II**  
**Employment laws and industrial (collective) relations laws by GNP per capita**

The table classifies countries by GNP per capita and shows the Employment laws index, the Industrial (collective) relations laws index, and their respective subindices. The components of each subindex are not included in the table but can be found at <http://iicg.som.yale.edu/>. All the variables are described in Table I.

Countries	Employment laws				Industrial (collective) relations laws			
	Subindex: Alternative employment contracts	Subindex: Conditions of employment	Subindex: Job security	Employment laws index	Subindex: Collective bargaining	Subindex: Worker participation in management	Subindex: Collective disputes	Industrial (collective) relations laws index
<i>Bottom 25 percentile of GNP per capita</i>								
Mozambique	0.72	0.79	0.71	<b>2.23</b>	0.44	0.00	0.80	<b>1.24</b>
Malawi	0.56	0.73	0.44	<b>1.72</b>	0.44	0.00	0.25	<b>0.69</b>
Tanzania	0.58	0.68	0.50	<b>1.76</b>	0.11	0.25	0.38	<b>0.74</b>
Burkina Faso	0.68	0.75	0.23	<b>1.65</b>	0.56	0.00	0.77	<b>1.32</b>
Madagascar	0.68	0.77	0.56	<b>2.01</b>	0.78	0.00	0.62	<b>1.39</b>
Mali	0.68	0.83	0.21	<b>1.72</b>	0.44	0.00	0.70	<b>1.14</b>
Nigeria	0.44	0.64	0.26	<b>1.35</b>	0.22	0.00	0.25	<b>0.47</b>
Uganda	0.44	0.77	0.50	<b>1.71</b>	0.78	0.00	0.32	<b>1.09</b>
Vietnam	0.66	0.75	0.43	<b>1.83</b>	0.33	0.75	0.62	<b>1.70</b>
Kenya	0.56	0.48	0.17	<b>1.21</b>	0.44	0.00	0.30	<b>0.74</b>
Zambia	0.56	0.59	0.00	<b>1.15</b>	0.22	0.25	0.22	<b>0.69</b>
Ghana	0.22	0.75	0.16	<b>1.13</b>	0.89	0.25	0.35	<b>1.49</b>
Mongolia	0.56	0.63	0.19	<b>1.38</b>	0.17	0.00	0.40	<b>0.57</b>
India	0.48	0.63	0.19	<b>1.30</b>	0.00	0.58	0.50	<b>1.08</b>
Kyrgyz Republic	0.78	0.87	0.36	<b>2.01</b>	0.33	0.25	0.57	<b>1.15</b>
Pakistan	0.32	0.68	0.18	<b>1.17</b>	0.11	0.25	0.45	<b>0.81</b>
Armenia	0.66	0.83	0.40	<b>1.88</b>	0.44	0.00	0.75	<b>1.19</b>
Senegal	0.64	0.74	0.29	<b>1.66</b>	0.78	0.00	0.63	<b>1.41</b>
Georgia	0.66	0.63	0.51	<b>1.80</b>	0.44	0.25	0.68	<b>1.38</b>
China	0.56	0.65	0.42	<b>1.62</b>	0.00	1.00	0.40	<b>1.40</b>
Zimbabwe	0.56	0.11	0.20	<b>0.87</b>	0.44	0.25	0.52	<b>1.21</b>
Sri Lanka	0.56	0.52	0.42	<b>1.50</b>	0.44	0.25	0.58	<b>1.28</b>
Bolivia	0.39	0.87	0.57	<b>1.82</b>	0.44	0.00	0.67	<b>1.11</b>
Ukraine	0.72	0.84	0.68	<b>2.24</b>	0.56	0.25	0.62	<b>1.42</b>
Indonesia	0.83	0.50	0.43	<b>1.75</b>	0.22	0.00	0.57	<b>0.79</b>
Bulgaria	0.55	0.88	0.31	<b>1.74</b>	0.44	0.25	0.55	<b>1.24</b>
<b>Mean</b>	<b>0.58</b>	<b>0.69</b>	<b>0.36</b>	<b>1.62</b>	<b>0.40</b>	<b>0.19</b>	<b>0.52</b>	<b>1.11</b>
<b>Median</b>	<b>0.56</b>	<b>0.73</b>	<b>0.38</b>	<b>1.72</b>	<b>0.44</b>	<b>0.13</b>	<b>0.56</b>	<b>1.17</b>
<i>Middle 50 percentile of GNP per capita</i>								
Egypt, Arab Rep.	0.56	0.77	0.46	<b>1.78</b>	0.44	1.00	0.30	<b>1.74</b>
Philippines	0.39	0.65	0.57	<b>1.61</b>	0.89	0.50	0.65	<b>2.04</b>
Morocco	0.56	0.61	0.11	<b>1.28</b>	0.33	0.00	0.88	<b>1.22</b>
Kazakstan	0.66	0.81	0.59	<b>2.07</b>	0.78	0.25	0.83	<b>1.86</b>
Romania	0.65	0.81	0.30	<b>1.76</b>	0.89	0.00	0.70	<b>1.59</b>
Ecuador	0.57	0.62	0.67	<b>1.86</b>	0.78	0.00	0.83	<b>1.61</b>
Jordan	0.39	0.52	0.55	<b>1.46</b>	0.56	0.00	0.45	<b>1.01</b>
Dominican Rep.	0.56	0.77	0.33	<b>1.65</b>	0.56	0.00	0.38	<b>0.94</b>
Jamaica	0.56	0.48	0.13	<b>1.16</b>	0.44	0.00	0.15	<b>0.59</b>
Tunisia	0.81	0.49	0.38	<b>1.68</b>	0.44	0.25	0.32	<b>1.01</b>
Lithuania	0.62	0.85	0.34	<b>1.81</b>	0.44	0.00	0.65	<b>1.09</b>
Latvia	0.56	0.81	0.41	<b>1.77</b>	0.67	0.25	0.70	<b>1.62</b>
Peru	0.23	0.74	0.70	<b>1.67</b>	0.89	0.58	0.82	<b>2.29</b>
Colombia	0.56	0.82	0.62	<b>1.99</b>	0.78	0.33	0.70	<b>1.81</b>
Russian Federation	0.78	0.75	0.68	<b>2.21</b>	0.78	0.25	0.62	<b>1.64</b>
Thailand	0.74	0.62	0.43	<b>1.78</b>	0.67	0.00	0.32	<b>0.98</b>
Panama	0.87	0.84	0.67	<b>2.38</b>	0.44	0.00	0.80	<b>1.24</b>
Turkey	0.72	0.81	0.20	<b>1.74</b>	0.89	0.00	0.55	<b>1.44</b>
Lebanon	0.35	0.45	0.40	<b>1.20</b>	0.22	0.00	0.53	<b>0.76</b>
Venezuela	0.85	0.84	0.64	<b>2.32</b>	0.89	0.00	0.57	<b>1.46</b>
Poland	0.56	0.89	0.46	<b>1.90</b>	0.89	0.25	0.50	<b>1.64</b>

Countries	Employment laws				Industrial (collective) relations laws			
	Subindex: Alternative employment contracts	Subindex: Conditions of employment	Subindex: Job security	Employment laws index	Subindex: Collective bargaining	Subindex: Worker participation in management	Subindex: Collective disputes	Industrial (collective) relations laws index
South Africa	0.56	0.33	0.16	1.04	0.89	0.25	0.60	1.74
Mexico	0.53	0.77	0.71	2.01	0.89	0.00	0.72	1.61
Slovak Republic	0.55	0.86	0.61	2.02	0.89	0.00	0.45	1.34
Croatia	0.83	0.88	0.42	2.12	0.56	0.25	0.45	1.26
Hungary	0.62	0.90	0.22	1.74	0.89	0.25	0.60	1.74
Malaysia	0.56	0.22	0.09	0.87	0.00	0.00	0.42	0.42
Brazil	0.85	0.86	0.69	2.40	0.56	0.75	0.55	1.86
Chile	0.70	0.55	0.31	1.56	0.78	0.00	0.40	1.18
Czech Republic	0.33	0.63	0.35	1.31	0.22	0.25	0.30	0.77
Uruguay	0.72	0.52	0.03	1.27	0.56	0.00	0.47	1.02
Argentina	0.39	0.72	0.44	1.55	0.89	0.33	0.72	1.94
Slovenia	0.68	0.87	0.45	2.00	0.44	0.75	0.57	1.76
Taiwan	0.87	0.54	0.34	1.75	0.33	0.42	0.35	1.10
Portugal	0.83	0.84	0.70	2.36	0.89	0.75	0.62	2.26
Korea	0.35	0.75	0.26	1.36	0.89	0.25	0.55	1.69
Greece	0.83	0.78	0.29	1.89	0.44	0.25	0.57	1.26
Spain	0.83	0.85	0.50	2.18	0.89	0.58	0.65	2.12
New Zealand	0.56	0.47	0.04	1.06	0.00	0.00	0.43	0.43
Israel	0.56	0.56	0.16	1.28	0.22	0.00	0.32	0.54
Ireland	0.56	0.36	0.12	1.04	0.56	0.00	0.43	0.99
<b>Mean</b>	<b>0.61</b>	<b>0.69</b>	<b>0.40</b>	<b>1.70</b>	<b>0.62</b>	<b>0.21</b>	<b>0.55</b>	<b>1.38</b>
<b>Median</b>	<b>0.56</b>	<b>0.75</b>	<b>0.41</b>	<b>1.75</b>	<b>0.67</b>	<b>0.25</b>	<b>0.55</b>	<b>1.44</b>
<i>Top 25 percentile of GNP per capita</i>								
Canada	0.56	0.49	0.17	1.22	0.11	0.00	0.22	0.33
Italy	0.76	0.51	0.24	1.51	0.78	0.50	0.75	2.03
United Kingdom	0.56	0.26	0.20	1.02	0.00	0.00	0.25	0.25
Australia	0.22	0.55	0.14	0.92	0.22	0.00	0.52	0.74
Hong Kong	0.56	0.19	0.01	0.76	0.44	0.00	0.60	1.04
Finland	0.78	0.38	0.57	1.73	0.44	0.25	0.25	0.94
France	0.74	0.54	0.31	1.59	0.78	0.75	0.60	2.13
Belgium	0.72	0.82	0.22	1.77	0.44	0.25	0.33	1.03
Netherlands	0.56	0.76	0.37	1.68	0.22	0.58	0.47	1.27
Singapore	0.56	0.19	0.11	0.85	0.11	0.00	0.53	0.64
Sweden	0.37	0.30	0.39	1.05	0.67	0.25	0.52	1.43
Austria	0.22	0.40	0.18	0.80	0.11	0.50	0.23	0.84
Germany	0.72	0.35	0.50	1.57	0.78	0.50	0.48	1.76
United States	0.56	0.29	0.08	0.92	0.11	0.00	0.25	0.36
Denmark	0.56	0.27	0.12	0.95	0.33	0.50	0.20	1.03
Norway	0.61	0.37	0.30	1.29	0.56	1.00	0.58	2.14
Japan	0.59	0.64	0.19	1.42	1.00	0.00	0.53	1.53
Switzerland	0.56	0.46	0.26	1.28	0.33	0.00	0.43	0.77
<b>Mean</b>	<b>0.57</b>	<b>0.43</b>	<b>0.24</b>	<b>1.24</b>	<b>0.41</b>	<b>0.28</b>	<b>0.43</b>	<b>1.13</b>
<b>Median</b>	<b>0.56</b>	<b>0.39</b>	<b>0.21</b>	<b>1.25</b>	<b>0.39</b>	<b>0.25</b>	<b>0.48</b>	<b>1.03</b>
<b>Mean all countries</b>	<b>0.59</b>	<b>0.63</b>	<b>0.35</b>	<b>1.58</b>	<b>0.51</b>	<b>0.22</b>	<b>0.51</b>	<b>1.24</b>
<b>Median all countries</b>	<b>0.56</b>	<b>0.65</b>	<b>0.34</b>	<b>1.66</b>	<b>0.44</b>	<b>0.25</b>	<b>0.53</b>	<b>1.24</b>
<i>Tests of Means (t-stats)</i>								
Bottom 25 vs Middle 50 percentile	-1.19	-0.88	-2.07 <sup>b</sup>	-1.97 <sup>c</sup>	-3.47 <sup>a</sup>	-0.33	-1.33	-2.84 <sup>a</sup>
Bottom 25 vs Top 25 percentile	0.11	4.70 <sup>a</sup>	2.28 <sup>b</sup>	3.46 <sup>a</sup>	0.12	-0.51	1.49	0.29
Middle 50 vs Top 25 percentile	1.24	6.10 <sup>a</sup>	4.43 <sup>a</sup>	5.67 <sup>a</sup>	3.38 <sup>a</sup>	-0.30	3.16 <sup>a</sup>	2.63 <sup>b</sup>
<i>Tests of Medians (z-stats)</i>								
Bottom 25 vs Middle 50 percentile	-1.06	-1.40	-1.97 <sup>c</sup>	-1.99 <sup>b</sup>	-3.33 <sup>a</sup>	-0.54	-1.22	-2.62 <sup>a</sup>
Bottom 25 vs Top 25 percentile	0.10	3.95 <sup>a</sup>	2.26 <sup>b</sup>	3.06 <sup>a</sup>	0.22	-0.32	1.44	0.80
Middle 50 vs Top 25 percentile	1.10	4.70 <sup>a</sup>	3.94 <sup>a</sup>	4.67 <sup>a</sup>	3.12 <sup>a</sup>	0.00	3.04 <sup>a</sup>	2.47 <sup>b</sup>

a=significant at 1% level; b=significant at 5% level; c=significant at 10% level.

**Table III**  
**Social security laws by GNP per capita**

The table classifies countries by GNP per capita and shows the social security laws index and its subindices. The components of each subindex are not included in the table but can be found at <http://iicg.som.yale.edu/>. All the variables are described in Table I.

Countries	The Social security system covers the risk of old age, disability and death	Subindex: Old age, disability and death benefits	The social security system covers the risk of sickness	Subindex: Sickness and health benefits	The Social security system covers the risk of unemployment	Subindex: Unemployment benefits	Social security laws index
<i>Bottom 25 percentile of GNP per capita</i>							
Mozambique	1	0.00	1	0.69	0	0.00	<b>0.69</b>
Malawi	0	0.00	0	0.00	0	0.00	<b>0.00</b>
Tanzania	1	0.26	0	0.00	0	0.00	<b>0.26</b>
Burkina Faso	1	0.43	0	0.00	0	0.00	<b>0.43</b>
Madagascar	1	0.56	0	0.00	0	0.00	<b>0.56</b>
Mali	1	0.49	0	0.00	0	0.00	<b>0.49</b>
Nigeria	1	0.55	1	0.48	0	0.00	<b>1.03</b>
Uganda	1	0.33	0	0.00	0	0.00	<b>0.33</b>
Vietnam	1	0.62	1	0.94	0	0.00	<b>1.55</b>
Kenya	1	0.33	1	0.61	0	0.00	<b>0.93</b>
Zambia	1	0.32	0	0.00	0	0.00	<b>0.32</b>
Ghana	1	0.47	0	0.00	0	0.00	<b>0.47</b>
Mongolia	1	0.00	1	0.85	1	0.82	<b>1.68</b>
India	1	0.43	1	0.77	0	0.00	<b>1.20</b>
Kyrgyz Republic	1	0.57	1	0.97	1	0.82	<b>2.36</b>
Pakistan	1	0.53	1	0.86	0	0.00	<b>1.39</b>
Armenia	1	0.47	1	0.98	1	0.75	<b>2.21</b>
Senegal	1	0.51	1	0.64	0	0.00	<b>1.15</b>
Georgia	1	0.60	0	0.00	1	0.75	<b>1.35</b>
China	1	0.56	1	0.96	1	0.72	<b>2.24</b>
Zimbabwe	1	0.48	0	0.00	0	0.00	<b>0.48</b>
Sri Lanka	1	0.59	0	0.00	0	0.00	<b>0.59</b>
Bolivia	1	0.23	1	0.88	0	0.00	<b>1.11</b>
Ukraine	1	0.57	1	1.00	1	0.91	<b>2.48</b>
Indonesia	1	0.53	0	0.00	0	0.00	<b>0.53</b>
Bulgaria	1	0.60	1	0.81	1	0.84	<b>2.25</b>
<b>Mean</b>	<b>0.96</b>	<b>0.42</b>	<b>0.54</b>	<b>0.44</b>	<b>0.27</b>	<b>0.22</b>	<b>1.08</b>
<b>Median</b>	<b>1.00</b>	<b>0.49</b>	<b>1.00</b>	<b>0.55</b>	<b>0.00</b>	<b>0.00</b>	<b>0.98</b>
<i>Middle 50 percentile of GNP per capita</i>							
Egypt	1	0.56	1	0.85	1	0.80	<b>2.22</b>
Philippines	1	0.62	1	0.87	0	0.00	<b>1.49</b>
Morocco	1	0.68	1	0.87	0	0.00	<b>1.54</b>
Kazakhstan	1	0.56	0	0.00	0	0.00	<b>0.56</b>
Romania	1	0.52	1	0.75	1	0.82	<b>2.09</b>
Ecuador	1	0.62	1	0.79	1	0.49	<b>1.90</b>
Jordan	1	0.63	0	0.00	0	0.00	<b>0.63</b>
Dominican Republic	1	0.63	1	0.81	0	0.00	<b>1.44</b>
Jamaica	1	0.50	0	0.00	0	0.00	<b>0.50</b>
Tunisia	1	0.68	1	0.75	1	0.69	<b>2.12</b>
Lithuania	1	0.48	1	0.96	1	0.74	<b>2.18</b>
Latvia	1	0.51	1	0.80	1	0.80	<b>2.11</b>
Peru	1	0.42	1	0.82	0	0.00	<b>1.24</b>
Colombia	1	0.66	1	0.79	1	0.85	<b>2.30</b>
Russia	1	0.57	1	1.00	1	0.90	<b>2.47</b>
Thailand	1	0.62	1	0.79	0	0.00	<b>1.41</b>
Panama	1	0.69	1	0.86	1	0.60	<b>2.15</b>
Turkey	1	0.67	1	0.72	0	0.00	<b>1.38</b>
Lebanon	1	0.56	1	0.62	0	0.00	<b>1.18</b>
Venezuela	1	0.64	1	0.84	1	0.63	<b>2.11</b>
Poland	1	0.33	1	0.74	1	0.83	<b>1.90</b>
South Africa	1	0.34	1	0.61	1	0.73	<b>1.69</b>

Countries	The Social security system covers the risk of old age, disability and death	Subindex: Old age, disability and death benefits	The social security system covers the risk of sickness	Subindex: Sickness and health benefits	The Social security system covers the risk of unemployment	Subindex: Unemployment benefits	<b>Social security laws index</b>
Mexico	1	0.73	1	0.80	0	0.00	<b>1.52</b>
Slovak Republic	1	0.56	1	0.86	1	0.79	<b>2.22</b>
Croatia	1	0.49	1	0.76	1	0.80	<b>2.05</b>
Hungary	1	0.55	1	0.83	1	0.78	<b>2.17</b>
Malaysia	1	0.57	0	0.00	0	0.00	<b>0.57</b>
Brazil	1	0.51	1	0.58	1	0.56	<b>1.65</b>
Chile	1	0.46	1	0.79	1	0.73	<b>1.98</b>
Czech Republic	1	0.51	1	0.80	1	0.74	<b>2.05</b>
Uruguay	1	0.48	1	0.75	1	0.76	<b>1.98</b>
Argentina	1	0.37	1	0.94	1	0.85	<b>2.15</b>
Slovenia	1	0.53	1	0.82	1	0.86	<b>2.21</b>
Taiwan	1	0.67	1	0.75	1	0.67	<b>2.09</b>
Portugal	1	0.59	1	0.70	1	0.85	<b>2.15</b>
Korea	1	0.60	1	0.72	1	0.72	<b>2.03</b>
Greece	1	0.71	1	0.78	1	0.80	<b>2.28</b>
Spain	1	0.73	1	0.76	1	0.81	<b>2.30</b>
New Zealand	1	0.84	1	0.75	1	0.56	<b>2.15</b>
Israel	1	0.69	1	0.84	1	0.85	<b>2.37</b>
Ireland	1	0.72	1	0.59	1	0.76	<b>2.08</b>
<b>Mean</b>	<b>1.00</b>	<b>0.58</b>	<b>0.90</b>	<b>0.71</b>	<b>0.71</b>	<b>0.53</b>	<b>1.82</b>
<b>Median</b>	<b>1.00</b>	<b>0.57</b>	<b>1.00</b>	<b>0.79</b>	<b>1.00</b>	<b>0.73</b>	<b>2.05</b>
<i>Top 25 percentile of GNP per capita</i>							
Canada	1	0.74	1	0.89	1	0.70	<b>2.33</b>
Italy	1	0.64	1	0.88	1	0.73	<b>2.26</b>
United Kingdom	1	0.61	1	0.68	1	0.78	<b>2.06</b>
Australia	1	0.75	1	0.72	1	0.79	<b>2.25</b>
Hong Kong	1	0.81	1	0.91	1	0.72	<b>2.44</b>
Finland	1	0.71	1	0.81	1	0.91	<b>2.43</b>
France	1	0.83	1	0.65	1	0.82	<b>2.29</b>
Belgium	1	0.50	1	0.55	1	0.86	<b>1.91</b>
Netherlands	1	0.48	1	0.68	1	0.68	<b>1.83</b>
Singapore	1	0.56	1	0.80	0	0.00	<b>1.36</b>
Sweden	1	0.82	1	0.85	1	0.94	<b>2.61</b>
Austria	1	0.54	1	0.90	1	0.63	<b>2.06</b>
Germany	1	0.69	1	0.53	1	0.78	<b>2.00</b>
United States	1	0.57	1	0.67	1	0.66	<b>1.90</b>
Denmark	1	0.82	1	0.99	1	0.90	<b>2.70</b>
Norway	1	0.74	1	0.94	1	0.82	<b>2.50</b>
Japan	1	0.61	1	0.54	1	0.82	<b>1.97</b>
Switzerland	1	0.65	1	0.86	1	0.74	<b>2.26</b>
<b>Mean</b>	<b>1.00</b>	<b>0.67</b>	<b>1.00</b>	<b>0.77</b>	<b>0.94</b>	<b>0.74</b>	<b>2.18</b>
<b>Median</b>	<b>1.00</b>	<b>0.67</b>	<b>1.00</b>	<b>0.81</b>	<b>1.00</b>	<b>0.78</b>	<b>2.26</b>
<b>Mean all countries</b>	<b>0.99</b>	<b>0.55</b>	<b>0.81</b>	<b>0.64</b>	<b>0.62</b>	<b>0.48</b>	<b>1.67</b>
<b>Median all countries</b>	<b>1.00</b>	<b>0.56</b>	<b>1.00</b>	<b>0.76</b>	<b>1.00</b>	<b>0.70</b>	<b>1.98</b>
<i>Tests of Means (t-stats)</i>							
Bottom 25 vs Middle 50 percentile	-1.39	-3.82 <sup>a</sup>	-3.62 <sup>a</sup>	-3.49 <sup>a</sup>	-3.62 <sup>a</sup>	-3.52 <sup>a</sup>	<b>-4.86<sup>a</sup></b>
Bottom 25 vs Top 25 percentile	-0.98	-5.51 <sup>a</sup>	-4.47 <sup>a</sup>	-3.76 <sup>a</sup>	-6.93 <sup>a</sup>	-6.72 <sup>a</sup>	<b>-7.27<sup>a</sup></b>
Middle 50 vs Top 25 percentile	n.a.	-4.15 <sup>a</sup>	-1.66	-0.92	-2.60 <sup>b</sup>	-2.62 <sup>b</sup>	<b>-3.06<sup>a</sup></b>
<i>Tests of Medians (z-stats)</i>							
Bottom 25 vs Middle 50 percentile	-1.38	-3.35 <sup>a</sup>	-3.32 <sup>a</sup>	-2.34 <sup>b</sup>	-3.31 <sup>a</sup>	-3.09 <sup>a</sup>	<b>-3.85<sup>a</sup></b>
Bottom 25 vs Top 25 percentile	-0.98	-4.72 <sup>a</sup>	-3.71 <sup>a</sup>	-2.39 <sup>b</sup>	-4.76 <sup>a</sup>	-4.27 <sup>a</sup>	<b>-4.69<sup>a</sup></b>
Middle 50 vs Top 25 percentile	n.a.	-3.57 <sup>a</sup>	-1.63	-0.23	-2.49 <sup>b</sup>	-1.91 <sup>c</sup>	<b>-2.76<sup>a</sup></b>

a=significant at 1% level; b=significant at 5% level; c=significant at 10% level; na=not applicable.

**Table IV**  
**Correlations between regulation of labor, income, left power and legal origin**

This table presents the pairwise correlations between the measures of regulation of labor, income, left power, and legal origin for the whole sample. All the variables are described in Table I.

	Employment laws index	Industrial (collective) relations laws index	Social security laws index	Log GNP per capita	Chief executive left or center party	Legislature left or center party	Chief executive and legislature left or center party	Union density	Percentage of labor force covered by collective agreements	English legal origin	Socialist legal origin	French legal origin	German legal origin
Industrial (collective) relations laws index	0.5172 <sup>a</sup>												
Social security laws index	0.0746	0.2309											
Log GNP per capita	-0.2861	0.0456	0.6686 <sup>a</sup>										
Chief executive left or center party	0.3271	0.2532	0.0118	-0.3660 <sup>a</sup>									
Legislature left or center party	0.2932	0.2398	0.0744	-0.2571	0.8704 <sup>a</sup>								
Chief executive and legislature left or center party	0.3210	0.2333	0.0014	-0.3802 <sup>b</sup>	0.9791 <sup>a</sup>	0.9003 <sup>a</sup>							
Union density	0.0443	0.0780	0.3882 <sup>c</sup>	0.2775	0.2454	0.2908	0.2313						
Percentage of labor force covered by collective agreements	0.1888	0.3718	0.4118	0.3885	0.3442	0.3789	0.3105	0.4541					
English legal origin	-0.5851 <sup>a</sup>	-0.5661 <sup>a</sup>	-0.3727 <sup>a</sup>	-0.0843	-0.2096	-0.2374	-0.1869	-0.2138	-0.3640				
Socialist legal origin	0.3560 <sup>c</sup>	0.1607	0.2601	-0.2182	0.4329 <sup>a</sup>	0.3728 <sup>c</sup>	0.4400 <sup>a</sup>	0.2594	-0.0136	-0.3365			
French legal origin	0.3927 <sup>b</sup>	0.3468	-0.0851	-0.0568	-0.1135	-0.1305	-0.1560	-0.2789	0.2269	-0.4874 <sup>a</sup>	-0.4169 <sup>a</sup>		
German legal origin	-0.1469	0.0225	0.1579	0.3474	-0.1863	-0.1073	-0.1681	-0.0036	0.0461	-0.1729	-0.1479	-0.2141	
Scandinavian legal origin	-0.1772	0.0665	0.2840	0.3180	0.0789	0.1996	0.0918	0.5708 <sup>a</sup>	0.1960	-0.1394	-0.1192	-0.1727	-0.0612

a=significant at 1% level; b=significant at 5% level; c=significant at 10% level.

**Table V**  
**Regulation of labor and legal origin**

Ordinary least squares regressions of the cross section of countries. The dependent variables are the Employment laws index, the Industrial (collective) relations laws index, the Social security laws index and their respective components. Robust standard errors are in parentheses. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent variables:	Log GNP per capita	Socialist legal origin	French legal origin	German legal origin	Scandinavian legal origin	Constant	N [R <sup>2</sup> ]
<i>Panel A: Employment laws and legal origin</i>							
Employment laws index	-0.0496 <sup>b</sup> (0.0110)	0.6318 <sup>a</sup> (0.0818)	0.5937 <sup>a</sup> (0.0789)	0.2754 <sup>b</sup> (0.1357)	0.1807 (0.1679)	1.5868 <sup>a</sup> (0.1755)	85 [0.52]
Alternative employment contracts subindex	0.0111 (0.0092)	0.1193 <sup>a</sup> (0.0362)	0.1228 <sup>a</sup> (0.0388)	0.0098 (0.0995)	0.0351 (0.0832)	0.4296 <sup>a</sup> (0.0760)	85 [0.13]
Conditions of employment subindex	-0.0332 <sup>a</sup> (0.0108)	0.2993 <sup>a</sup> (0.0433)	0.2297 <sup>a</sup> (0.0418)	0.1153 <sup>c</sup> (0.0687)	-0.0688 (0.0481)	0.7425 <sup>a</sup> (0.0940)	85 [0.55]
Job security subindex	-0.0271 <sup>b</sup> (0.1119)	0.2120 <sup>a</sup> (0.0438)	0.2406 <sup>a</sup> (0.0439)	0.1473 <sup>a</sup> (0.0530)	0.2109 <sup>b</sup> (0.0870)	0.4146 <sup>a</sup> (0.1060)	85 [0.33]
<i>Panel B: Industrial (collective) relation laws and legal origin</i>							
Industrial (collective) relations laws index	0.0094 (0.0292)	0.5847 <sup>a</sup> (0.1114)	0.6505 <sup>a</sup> (0.1123)	0.4540 <sup>b</sup> (0.1995)	0.5565 <sup>b</sup> (0.2685)	0.7336 <sup>a</sup> (0.2331)	85 [0.33]
Collective bargaining subindex	0.0013 (0.0189)	0.2070 <sup>b</sup> (0.0853)	0.2928 <sup>a</sup> (0.0705)	0.2424 (0.1548)	0.1679 <sup>c</sup> (0.0966)	0.3182 <sup>c</sup> (0.1628)	85 [0.18]
Worker participation in management subindex	0.0166 (0.0185)	0.1864 <sup>b</sup> (0.0734)	0.1328 <sup>b</sup> (0.0638)	0.1430 (0.1024)	0.3606 <sup>b</sup> (0.1658)	-0.0329 (0.1559)	85 [0.12]
Collective disputes subindex	-0.0085 (0.0105)	0.1912 <sup>a</sup> (0.0420)	0.2248 <sup>a</sup> (0.0401)	0.0686 (0.0608)	0.0279 (0.0948)	0.4483 <sup>a</sup> (0.0846)	85 [0.34]
<i>Panel C: Social security laws and legal origin</i>							
Social security laws index	0.3179 <sup>a</sup> (0.0288)	0.8919 <sup>a</sup> (0.1438)	0.3065 <sup>b</sup> (0.1163)	0.0979 (0.1368)	0.5020 <sup>a</sup> (0.1264)	-1.2269 <sup>a</sup> (0.2417)	85 [0.66]
Old age, disability and death benefits subindex	0.0591 <sup>a</sup> (0.0131)	0.0075 (0.0430)	0.0273 (0.0375)	-0.0304 (0.0446)	0.0971 <sup>b</sup> (0.0455)	0.0623 (0.1109)	85 [0.37]
Sickness and health benefits subindex	0.0991 <sup>a</sup> (0.0211)	0.3670 <sup>a</sup> (0.0938)	0.1787 <sup>b</sup> (0.0775)	0.0363 (0.0904)	0.1898 <sup>b</sup> (0.0721)	-0.3169 (0.1954)	85 [0.31]
Unemployment benefits subindex	0.1600 <sup>a</sup> (0.0149)	0.5166 <sup>a</sup> (0.0712)	0.1019 (0.0665)	0.0938 (0.0783)	0.2153 <sup>a</sup> (0.0806)	-0.9758 <sup>a</sup> (0.0986)	85 [0.62]

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.

**Table VI**  
**Regulation of labor and left power**

Ordinary least squares regressions of the cross-section of countries. The dependent variables are the Employment laws index, the Industrial (collective) relations laws index and the Social security laws index. Robust standard errors are in parenthesis. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent variables:	Log GNP per capita	Left or center party in power			Interest groups		Constant	N [R <sup>2</sup> ]	
		Chief executive	Legislature	Chief executive and legislature	Union density	Percentage of labor force covered by collective agreements			
<i>Panel A: Employment laws and left power</i>									
Employment laws index	-0.0487 <sup>c</sup> (0.0275)	0.2787 <sup>b</sup> (0.1232)					1.7974 <sup>a</sup> (0.2602)	85 [0.14]	
	-0.0572 <sup>b</sup> (0.0271)		0.2603 <sup>b</sup> (0.1105)				1.8669 <sup>a</sup> (0.2484)	85 [0.13]	
	-0.0487 <sup>c</sup> (0.0280)			0.2618 <sup>b</sup> (0.1191)			1.8143 <sup>a</sup> (0.2602)	85 [0.13]	
	-0.0826 <sup>a</sup> (0.0305)				0.2375 (0.2172)		2.1680 <sup>a</sup> (0.2480)	70 [0.08]	
	-0.1098 <sup>b</sup> (0.0463)					0.4610 <sup>b</sup> (0.2045)	2.2012 <sup>a</sup> (0.4180)	42 [0.16]	
<i>Panel B: Industrial (collective) relation laws and left power</i>									
Industrial (collective) relations laws index	0.0477 (0.0365)	0.3990 <sup>a</sup> (0.1479)					0.6090 <sup>c</sup> (0.3413)	85 [0.08]	
	0.0343 (0.0361)		0.3516 <sup>b</sup> (0.1500)				0.7324 <sup>b</sup> (0.3373)	85 [0.07]	
	0.0469 (0.0371)			0.3648 <sup>b</sup> (0.1399)			0.6465 <sup>c</sup> (0.3398)	85 [0.07]	
	0.0240 (0.0430)				0.2189 (0.2464)		1.3999 <sup>a</sup> (0.3277)	70 [0.01]	
	-0.0635 (0.0618)					0.7624 <sup>a</sup> (0.2648)	1.4183 <sup>b</sup> (0.5287)	42 [0.16]	
<i>Panel C: Social security laws and left power</i>									
Social security laws index	0.3357 <sup>a</sup> (0.0313)	0.5476 <sup>a</sup> (0.1486)					-1.3678 <sup>a</sup> (0.3138)	85 [0.52]	
	0.3182 <sup>a</sup> (0.0320)		0.4972 <sup>a</sup> (0.1479)				-1.2152 <sup>a</sup> (0.3100)	85 [0.51]	
	0.3379 <sup>a</sup> (0.0314)			0.5371 <sup>a</sup> (0.1420)			-1.3450 <sup>a</sup> (0.3079)	85 [0.52]	
	0.2348 <sup>a</sup> (0.0392)				0.6252 <sup>b</sup> (0.2715)		-0.3662 (0.3319)	70 [0.46]	
	0.2059 <sup>a</sup> (0.0589)					0.3525 (0.2341)	-0.0934 (0.5264)	42 [0.43]	

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.

**Table VII**  
**Regulation of labor, left power, and legal origin**

Ordinary least squares regressions of the cross-section of countries, excluding socialist countries. The dependent variables are the employment laws index, the Industrial (collective) relations laws index and the Social security laws index. Robust standard errors are in parentheses. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent variables:	Log GNP per capita	Left power*	French legal origin	German legal origin	Scandinavian legal origin	Constant	N [R <sup>2</sup> ]
<i>Panel A: Employment laws, left power and legal origin</i>							
Employment laws index	-0.0491 <sup>c</sup> (0.0260)	0.1149 (0.1364)	0.5855 <sup>a</sup> (0.0779)	0.2891 <sup>c</sup> (0.1489)	0.1496 (0.1713)	1.5252 <sup>a</sup> (0.2730)	66 [0.51]
	-0.0492 <sup>b</sup> (0.0243)	0.1376 (0.1151)	0.5830 <sup>a</sup> (0.0762)	0.2751 <sup>c</sup> (0.1512)	0.1148 (0.1877)	1.5112 <sup>a</sup> (0.2480)	66 [0.51]
	-0.0463 <sup>c</sup> (0.0270)	0.1316 (0.1357)	0.5884 <sup>a</sup> (0.0774)	0.2840 <sup>c</sup> (0.1510)	0.1362 (0.1727)	1.4973 <sup>a</sup> (0.2802)	66 [0.51]
	-0.0487 <sup>b</sup> (0.0241)	0.0438 (0.2425)	0.6422 <sup>a</sup> (0.0865)	0.3011 <sup>b</sup> (0.1371)	0.1833 (0.2063)	1.5386 <sup>a</sup> (0.2059)	57 [0.52]
	-0.0546 <sup>b</sup> (0.0228)	0.0623 (0.1623)	0.6995 <sup>a</sup> (0.1157)	0.3669 <sup>b</sup> (0.1715)	0.0987 (0.1224)	1.5226 <sup>a</sup> (0.2197)	38 [0.61]
<i>Panel B: Industrial (collective) relation laws, left power and legal origin</i>							
Industrial (collective) relations laws index	0.0220 (0.0344)	0.2345 (0.1565)	0.6326 <sup>a</sup> (0.1099)	0.4558 <sup>b</sup> (0.2213)	0.4636 <sup>c</sup> (0.2852)	0.5172 <sup>b</sup> (0.3248)	66 [0.37]
	0.0157 (0.0352)	0.2010 (0.1618)	0.6342 <sup>a</sup> (0.1124)	0.4407 <sup>b</sup> (0.2180)	0.4457 (0.2981)	0.5783 <sup>c</sup> (0.3293)	66 [0.37]
	0.0246 (0.0352)	0.2385 (0.1535)	0.6400 <sup>a</sup> (0.1096)	0.4486 <sup>b</sup> (0.2225)	0.4523 (0.2874)	0.4988 (0.3278)	66 [0.38]
	-0.0172 (0.0393)	-0.1397 (0.4065)	0.6947 <sup>a</sup> (0.1301)	0.5106 <sup>a</sup> (0.2029)	0.6934 <sup>c</sup> (0.3671)	0.9884 <sup>a</sup> (0.3203)	70 [0.01]
	-0.0587 (0.0606)	0.3752 (0.2437)	0.7360 <sup>a</sup> (0.1513)	0.4974 <sup>b</sup> (0.2130)	0.7745 <sup>b</sup> (0.3130)	1.1125 <sup>b</sup> (0.5322)	38 [0.49]
<i>Panel C: Social security laws, left power and legal origin</i>							
Social security laws index	0.3655 <sup>a</sup> (0.0316)	0.2433 (0.1549)	0.2844 <sup>b</sup> (0.1141)	0.0221 (0.1501)	0.3185 <sup>b</sup> (0.1394)	-1.7207 <sup>a</sup> (0.3110)	66 [0.74]
	0.3592 <sup>a</sup> (0.0324)	0.2119 (0.1575)	0.2858 <sup>b</sup> (0.1149)	0.0058 (0.1592)	0.2976 <sup>c</sup> (0.1540)	-1.6610 <sup>a</sup> (0.3146)	66 [0.73]
	0.3683 <sup>a</sup> (0.0321)	0.2484 <sup>c</sup> (0.1472)	0.2921 <sup>b</sup> (0.1133)	0.0146 (0.1513)	0.3062 <sup>b</sup> (0.1419)	-1.7410 <sup>a</sup> (0.3118)	66 [0.74]
	0.3129 <sup>a</sup> (0.0377)	-0.1584 (0.3178)	0.2369 <sup>c</sup> (0.1301)	0.0317 (0.1454)	0.5199 <sup>b</sup> (0.2097)	-1.0604 <sup>a</sup> (0.3221)	57 [0.65]
	0.2736 <sup>a</sup> (0.0511)	0.0224 (0.1985)	0.3736 <sup>a</sup> (0.1336)	0.1035 (0.1638)	0.5742 <sup>a</sup> (0.1492)	-0.8298 <sup>c</sup> (0.4148)	38 [0.69]

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.

\* The rows in the Left power column consist of the values of: first row=chief executive left or center party; second row=legislature left or center party; third row=chief executive and legislature left or center party; fourth row=union density; and fifth row= percentage of labor force covered by collective agreements.

**Table VIII**  
**Correlations between political and economic constraints, and legal origin**

This table shows the pairwise correlations between the measures political and economic constraints and legal origin for the whole sample. All the variables are described in Table I.

	Log GNP per capita	Constraints on executive power	Effectiveness of legislature	Autocracy	Actual openness	Geographic openness	Factor accumulation openness	English legal origin	Socialist legal origin	French legal origin	German legal origin
Constraints on executive power	0.6876 <sup>a</sup>										
Effectiveness of legislature	0.7523 <sup>a</sup>	0.9078 <sup>a</sup>									
Autocracy	-0.6548 <sup>a</sup>	-0.8844 <sup>a</sup>	-0.8514 <sup>a</sup>								
Actual openness	0.3465	0.1181	0.1484	-0.1050							
Geographic openness	0.3279	0.1361	0.1837	-0.0770	0.7103 <sup>a</sup>						
Factor accumulation openness	0.6410 <sup>a</sup>	0.4086 <sup>b</sup>	0.4270 <sup>b</sup>	-0.3318	0.6499 <sup>a</sup>	0.8106 <sup>a</sup>					
English legal origin	-0.0843	0.1998	0.1462	-0.2324	0.1601	-0.0494	-0.1843				
Socialist legal origin	-0.2182	-0.2927	-0.3236	0.5475 <sup>a</sup>	-0.0650	-0.0209	0.1333	-0.3365			
French legal origin	-0.0568	-0.1814	-0.1901	-0.0258	-0.1521	-0.0441	-0.1741	-0.4874 <sup>a</sup>	-0.4169 <sup>a</sup>		
German legal origin	0.3474 <sup>c</sup>	0.2008	0.2023	-0.1920	0.0356	0.0876	0.2344	-0.1729	-0.1479	-0.2141	
Scandinavian legal origin	0.3180	0.3274	0.3378	-0.2978	0.0462	0.1207	0.2927	-0.1394	-0.1192	-0.1727	-0.0612

a=significant at 1% level; b=significant at 5% level; c=significant at 10% level.

**Table IX**  
**Regulation of labor, political and economic constraints**

Ordinary least squares regressions of the cross section of countries. The dependent variables are the Employment laws index, the Industrial (collective) relations laws index and the Social security laws index. Robust standard errors are in parentheses. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent variables:	Log GNP per capita	Political constraints			Economic constraints			Constant	N [R <sup>2</sup> ]
		Constraints on executive power	Effectiveness of legislature	Autocracy	Actual openness	Geographic openness	Factor accumulation openness		
<i>Panel A: Employment laws, and political and economic constraints</i>									
Employment laws index	0.0093 (0.0385)	-0.0955 <sup>a</sup> (0.0332)						1.9286 <sup>a</sup> (0.2144)	84 [0.17]
	0.0260 (0.0456)		-0.2111 <sup>b</sup> (0.0808)					1.6971 <sup>a</sup> (0.2529)	73 [0.16]
	0.0086 (0.0328)			0.0695 <sup>a</sup> (0.0190)				1.2793 <sup>a</sup> (0.3134)	84 [0.19]
	-0.0370 (0.0269)					-0.0029 <sup>a</sup> (0.0008)		2.0098 <sup>a</sup> (0.2018)	73 [0.16]
	-0.0526 <sup>c</sup> (0.0267)						-0.0044 (0.0035)	2.0340 <sup>a</sup> (0.2049)	73 [0.09]
	-0.0490 (0.0348)							-0.0021 (0.0036)	1.9722 <sup>a</sup> (0.2321)
<i>Panel B: Industrial relation laws, and political and economic constraints</i>									
Industrial (collective) relations laws index	0.0769 <sup>c</sup> (0.0455)	-0.0775 <sup>c</sup> (0.0406)						0.9639 <sup>a</sup> (0.2667)	84 [0.04]
	0.1111 <sup>c</sup> (0.0575)		-0.2347 <sup>b</sup> (0.1074)					0.7397 <sup>b</sup> (0.3218)	73 [0.07]
	0.0734 <sup>c</sup> (0.0414)			0.0536 <sup>b</sup> (0.0247)				0.4704 (0.3839)	84 [0.05]
	0.0543 (0.0401)					-0.0035 <sup>a</sup> (0.0010)		0.9996 <sup>a</sup> (0.2687)	73 [0.09]
	0.0445 (0.0411)						-0.0092 <sup>b</sup> (0.0046)	1.0172 <sup>a</sup> (0.2718)	73 [0.05]
	0.0501 (0.0558)							-0.0041 (0.0045)	0.8991 <sup>b</sup> (0.3566)
<i>Panel C: Social security laws, and political and economic constraints</i>									
Social security laws index	0.3200 <sup>a</sup> (0.0516)	-0.0415 (0.0463)						-0.7202 <sup>b</sup> (0.3223)	84 [0.45]
	0.3672 <sup>a</sup> (0.0570)		-0.1366 (0.1045)					-1.1107 <sup>a</sup> (0.3361)	73 [0.56]
	0.3695 <sup>a</sup> (0.0438)			0.0767 <sup>b</sup> (0.0298)				-1.5639 <sup>a</sup> (0.4355)	84 [0.49]
	0.3534 <sup>a</sup> (0.0323)					-0.0034 <sup>a</sup> (0.0012)		-1.0242 <sup>a</sup> (0.2666)	73 [0.61]
	0.3397 <sup>a</sup> (0.0311)						-0.0073 (0.0046)	-1.0017 <sup>a</sup> (0.2643)	73 [0.58]
	0.3268 <sup>a</sup> (0.0427)							-0.0008 (0.0043)	-1.0060 <sup>a</sup> (0.3192)

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level

**Table X**  
**Regulation of labor, political and economic constraints, and legal origin**

Ordinary least squares regressions of the cross section of countries, excluding all socialist countries. The dependent variables are the Employment laws index in Panel A, the Industrial (collective) relations laws index in Panel B, and the Social security laws index in Panel C. Robust standard errors are in parentheses. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent Variables	Log GNP per capita	Political and economic constraints*	French legal origin	German legal origin	Scandinavian legal origin	Constant	N [R <sup>2</sup> ]
<i>Panel A: Employment laws, political and economic constraints, and legal origin</i>							
Employment laws index	-0.0457 (0.0325)	-0.0107 (0.0283)	0.5679 <sup>a</sup> (0.0851)	0.2602 <sup>c</sup> (0.1456)	0.1791 (0.1706)	1.6242 <sup>a</sup> (0.1854)	65 [0.49]
	-0.0417 (0.0398)	-0.0327 (0.0740)	0.5704 <sup>a</sup> (0.0893)	0.2561 <sup>c</sup> (0.1506)	0.1805 (0.1713)	1.6034 <sup>a</sup> (0.2090)	64 [0.49]
	-0.0452 (0.0322)	0.0090 (0.0236)	0.5706 <sup>a</sup> (0.0819)	0.2586 <sup>c</sup> (0.1438)	0.1779 (0.1709)	1.5449 <sup>a</sup> (0.2993)	65 (0.49)
	-0.0404 <sup>c</sup> (0.0227)	-0.0015 <sup>b</sup> (0.0006)	0.5831 <sup>a</sup> (0.0778)	0.2472 <sup>c</sup> (0.1442)	0.1551 (0.1682)	1.6291 <sup>a</sup> (0.1792)	65 [0.55]
	-0.0482 <sup>b</sup> (0.0223)	-0.0041 <sup>c</sup> (0.0024)	0.6132 <sup>a</sup> (0.0781)	0.2917 <sup>b</sup> (0.1288)	0.2078 (0.1677)	1.6441 <sup>a</sup> (0.1849)	65 [0.54]
	-0.0394 (0.0280)	-0.0029 (0.0024)	0.6147 <sup>a</sup> (0.0787)	0.3084 <sup>b</sup> (0.1249)	0.2340 (0.1676)	1.5543 <sup>a</sup> (0.2114)	65 [0.54]
<i>Panel B: Industrial (collective) laws, political and economic constraints, and legal origin</i>							
Industrial (collective) relations laws index	-0.0166 (0.0417)	0.0158 (0.0353)	0.6814 <sup>a</sup> (0.1085)	0.5131 <sup>b</sup> (0.2091)	0.6012 <sup>b</sup> (0.2756)	0.8473 <sup>a</sup> (0.2564)	65 [0.35]
	0.0118 (0.0516)	-0.0420 (0.1012)	0.6595 <sup>a</sup> (0.1134)	0.4749 <sup>b</sup> (0.2104)	0.6040 <sup>b</sup> (0.2746)	0.7871 <sup>a</sup> (0.2833)	64 [0.36]
	-0.0108 (0.0455)	-0.0069 (0.0289)	0.6702 <sup>a</sup> (0.1154)	0.5053 <sup>b</sup> (0.2157)	0.6017 <sup>b</sup> (0.2757)	0.8977 <sup>b</sup> (0.4083)	65 [0.35]
	0.0228 (0.0365)	-0.0018 <sup>c</sup> (0.0010)	0.6389 <sup>a</sup> (0.1175)	0.4149 <sup>b</sup> (0.2130)	0.5197 <sup>c</sup> (0.2932)	0.7611 <sup>a</sup> (0.2409)	65 [0.39]
	0.0254 (0.0361)	-0.0094 <sup>a</sup> (0.0031)	0.6741 <sup>a</sup> (0.1123)	0.4618 <sup>b</sup> (0.1887)	0.5851 <sup>b</sup> (0.2736)	0.7623 <sup>a</sup> (0.2456)	65 [0.42]
	0.0453 (0.0457)	-0.0066 <sup>c</sup> (0.0034)	0.6773 <sup>a</sup> (0.1134)	0.4994 <sup>a</sup> (0.1871)	0.6442 <sup>b</sup> (0.2630)	0.5599 <sup>c</sup> (0.3001)	65 [0.40]
<i>Panel C: Social security laws, political and economic constraints, and legal origin</i>							
Social security laws index	0.3244 <sup>a</sup> (0.0485)	0.0147 (0.0458)	0.3395 <sup>a</sup> (0.1246)	0.0912 (0.1531)	0.4735 <sup>a</sup> (0.1307)	-1.3682 <sup>a</sup> (0.2627)	65 [0.72]
	0.3538 <sup>a</sup> (0.0370)	-0.0878 (0.1293)	0.2919 <sup>b</sup> (0.1230)	0.0360 (0.1418)	0.4579 <sup>a</sup> (0.1323)	-1.3777 <sup>a</sup> (0.2582)	64 [0.72]
	0.3268 <sup>a</sup> (0.0485)	-0.0093 (0.0357)	0.3324 <sup>a</sup> (0.1169)	0.0885 (0.1525)	0.4745 <sup>a</sup> (0.1315)	-1.2914 <sup>a</sup> (0.4660)	65 [0.72]
	0.3786 <sup>a</sup> (0.0276)	-0.0029 <sup>a</sup> (0.0010)	0.2624 <sup>b</sup> (0.1093)	-0.0532 (0.1502)	0.3438 <sup>a</sup> (0.1133)	-1.4854 <sup>a</sup> (0.2297)	65 [0.76]
	0.3642 <sup>a</sup> (0.0265)	-0.0080 <sup>c</sup> (0.0043)	0.3197 <sup>a</sup> (0.1130)	0.0310 (0.1467)	0.4438 <sup>a</sup> (0.1322)	-1.4574 <sup>a</sup> (0.2335)	65 [0.75]
	0.3913 <sup>a</sup> (0.0334)	-0.0071 <sup>b</sup> (0.0033)	0.3231 <sup>a</sup> (0.1135)	0.0694 (0.1548)	0.5098 <sup>a</sup> (0.1421)	-1.6844 <sup>a</sup> (0.2595)	65 [0.74]

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.

\* The rows in the Political and economic constraints column consist of the values of: first row=constraints on executive power; second row=effectiveness of legislature; third row= autocracy; fourth row= actual openness; fifth row= geographic openness; sixth row= factor accumulation openness.

Table XI

## Interactions between legal origin and left political orientation: French vs English legal origins

Ordinary least squares regressions of the cross section of countries, excluding all socialist countries. The dependent variables are: (i) Employment laws in Panel A, and (ii) Industrial relation laws in Panel B. Each regression is separately run for French legal origin and English legal origin countries. For each pair of regressions, we run a Chow test of the equality of the estimated coefficients for French and English legal origins. Robust standard errors are shown in parentheses. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

	Left or center party in power				N [R <sup>2</sup> ]	Chow test of the equality of coefficients
	Log GNP per capita	Chief executive	Legislature	Chief executive and legislature		
<i>Panel A: The dependent variable is the employment laws index</i>						
French legal origin countries	0.0189 (0.0375)	0.3107 <sup>c</sup> (0.1600)			1.4614 <sup>a</sup> (0.3413)	32 [0.14] F(1,50)=3.00 Prob>F=0.09
English legal origin countries	-0.1083 <sup>a</sup> (0.0280)	-0.1116 (0.1847)			2.1012 <sup>a</sup> (0.3066)	24 [0.38]
French legal origin countries	0.0195 (0.0361)		0.3920 <sup>b</sup> (0.1471)		1.3970 <sup>a</sup> (0.3232)	32 [0.20] F(1,50)=5.11 Prob>F=0.03
English legal origin countries	-0.1017 <sup>a</sup> (0.0243)		-0.0590 (0.1350)		2.0241 <sup>a</sup> (0.2503)	24 [0.37]
French legal origin countries	0.0242 (0.0376)			0.3411 <sup>b</sup> (0.1548)	1.4183 <sup>a</sup> (0.3366)	32 [0.18] F(1,50)=3.91 Prob>F=0.05
English legal origin countries	-0.1110 <sup>a</sup> (0.0285)			-0.1245 (0.1782)	2.1262 <sup>a</sup> (0.3056)	24 [0.38]
<i>Panel B: The dependent variable is the industrial (collective) relation laws index</i>						
French legal origin countries	0.1304 <sup>a</sup> (0.0406)	0.4378 <sup>b</sup> (0.1882)			0.1775 (0.3946)	32 [0.24] F(1,50)=1.14 Prob>F=0.29
English legal origin countries	-0.0592 (0.0442)	0.0873 (0.2708)			1.2251 <sup>b</sup> (0.4731)	24 [0.13]
French legal origin countries	0.1255 <sup>b</sup> (0.0468)		0.4586 <sup>b</sup> (0.2089)		0.1888 (0.4477)	32 [0.24] F(1,50)=2.02 Prob>F=0.16
English legal origin countries	-0.0700 (0.0430)		-0.0105 (0.2569)		1.3588 <sup>a</sup> (0.4606)	24 [0.12]
French legal origin countries	0.1359 <sup>a</sup> (0.0413)			0.4566 <sup>b</sup> (0.1773)	0.1453 (0.3851)	32 [0.26] F(1,50)=1.56 Prob>F=0.22
English legal origin countries	-0.0621 (0.0466)			0.0566 (0.2686)	1.2641 <sup>b</sup> (0.4905)	24 [0.12]

a=significant at 1% level; b=significant at 5% level; c=significant at 10% level.

**Table XII**  
**Correlations between regulation indices**

The table shows the pairwise correlations between various indices of regulation for the cross section of 85 countries. All the variables are described in Table I.

	Employment laws index	Industrial (collective) relations laws index	Social security laws index	Court formalism index for the eviction of the non-paying tenant	Court formalism index for the collection of bounced check	Ln num. of steps to start a business	Ln num. of days to start a business
Industrial (collective) relations laws index	0.5172 <sup>a</sup>						
Social security laws index	0.0746	0.2309					
Court formalism index for the eviction of the non-paying tenant	0.4825 <sup>a</sup>	0.4736 <sup>a</sup>	0.0987				
Court formalism index for the collection of bounced check	0.5839 <sup>a</sup>	0.4257 <sup>a</sup>	0.0200	0.8505 <sup>a</sup>			
Ln number of steps to start a business	0.6184 <sup>a</sup>	0.4795 <sup>a</sup>	-0.2416	0.5036 <sup>a</sup>	0.5675 <sup>a</sup>		
Ln number of days to start a business	0.5343 <sup>a</sup>	0.4509 <sup>a</sup>	-0.3113	0.5274 <sup>a</sup>	0.5525 <sup>a</sup>	0.8263 <sup>a</sup>	
Ln cost to start a business/GDP per capita	0.3324 <sup>c</sup>	0.1712	-0.4755 <sup>a</sup>	0.3667 <sup>b</sup>	0.4309 <sup>a</sup>	0.6354 <sup>a</sup>	0.6147 <sup>a</sup>

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.

**Table XIII**  
**Regulation of labor and outcomes**

Ordinary least squares regressions of the cross-section of countries. Robust standard errors are in parentheses. All the variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent Variable	Log GNP per capita	Employment laws index	Industrial (collective) relations laws index	Social security laws index	Constant	N [R <sup>2</sup> ]
Size of the unofficial economy	-5.3282 <sup>a</sup> (0.7384)	6.7188 <sup>b</sup> (3.0029)			63.6364 <sup>a</sup> (9.5765)	85 [0.45]
	-5.8784 <sup>a</sup> (0.6747)		4.5755 <sup>b</sup> (2.1254)		72.9882 <sup>a</sup> (6.6536)	85 [0.44]
	-5.7587 <sup>a</sup> (1.0823)			-0.1979 (2.4501)	78.0462 <sup>a</sup> (6.7360)	85 [0.42]
Employment in the unofficial economy	-5.7691 <sup>a</sup> (1.2592)	13.7367 <sup>b</sup> (5.3313)			61.6865 <sup>a</sup> (16.4533)	46 [0.41]
	-7.4709 <sup>a</sup> (1.0255)		11.579 <sup>a</sup> (4.2348)		81.5947 <sup>a</sup> (9.4134)	46 [0.42]
	-6.4801 <sup>a</sup> (2.1811)			0.0124 (4.5390)	89.3573 <sup>a</sup> (11.7923)	46 [0.33]
Male participation rate in the labor force 1990-1994	-1.3425 <sup>a</sup> (0.2968)	-2.9938 <sup>a</sup> (0.9826)			99.0597 <sup>a</sup> (3.1063)	78 [0.26]
	-1.1249 <sup>a</sup> (0.2959)		-2.1552 <sup>a</sup> (0.6719)		95.3124 <sup>a</sup> (2.4506)	78 [0.24]
	-0.6121 (0.4005)			-1.8810 <sup>b</sup> (0.8820)	91.6207 <sup>a</sup> (2.4779)	78 [0.23]
Female participation rate in the labor force 1990-1994	-2.2087 <sup>c</sup> (1.1291)	-3.5546 (4.0892)			79.3615 <sup>a</sup> (12.3587)	78 [0.04]
	-1.9450 <sup>c</sup> (1.1362)		-3.0660 (3.7015)		75.5102 <sup>a</sup> (10.2537)	78 [0.04]
	-2.3802 <sup>c</sup> (1.3811)			1.4190 (3.6338)	72.7617 <sup>a</sup> (9.5206)	78 [0.03]
Unemployment rate 1991-2000	-0.4357 (0.4562)	2.7761 <sup>b</sup> (1.3931)			8.2037 (5.7803)	65 [0.13]
	-0.7536 <sup>c</sup> (0.3848)		1.0562 (1.0029)		13.9484 <sup>a</sup> (4.2089)	65 [0.08]
	-1.0708 <sup>b</sup> (0.4373)			1.5824 (1.2082)	15.0201 <sup>a</sup> (3.5625)	65 [0.09]
Unemployed males 20-24 years old / active males 20-24 years old 1991-2000	-0.2235 (0.9109)	6.3782 <sup>b</sup> (2.6693)			6.7976 (11.1265)	52 [0.15]
	-1.0123 (0.8021)		3.0877 <sup>c</sup> (1.8155)		19.6986 <sup>b</sup> (8.6119)	52 [0.09]
	-2.1224 <sup>b</sup> (0.8299)			6.2780 <sup>b</sup> (2.9503)	21.1194 <sup>b</sup> (8.2515)	52 [0.14]
Unemployed females 20-24 years old / active females 20-24 years old 1991-2000	-1.3496 (1.3337)	9.9943 <sup>b</sup> (3.7255)			14.1402 (16.2348)	52 [0.21]
	-2.5754 <sup>b</sup> (1.1289)		5.1375 <sup>c</sup> (2.7286)		33.8676 <sup>b</sup> (12.6670)	52 [0.15]
	-3.3478 <sup>a</sup> (1.1885)			3.7219 (4.6208)	40.1010 <sup>a</sup> (12.0999)	52 [0.11]
Average wages of machine operators / wages of clerks and workers in craft and related trades 1990-1999	0.0215 <sup>b</sup> (0.0103)	0.1040 <sup>c</sup> (0.0600)			0.6298 <sup>a</sup> (0.1391)	53 [0.07]
	0.0129 (0.0109)		0.0433 (0.0409)		0.8097 <sup>a</sup> (0.1010)	53 [0.03]
	-0.0124 (0.0182)			0.0899 <sup>c</sup> (0.0481)	0.9163 <sup>a</sup> (0.1016)	53 [0.09]

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.

**Table XIV**  
**Regulation of labor and outcomes (instrumental variables regressions)**

Instrumental variables regressions for the cross-section of countries using legal origin dummies as instruments for the employment laws index, the industrial (collective) laws index and the social security laws index. Errors are shown in parenthesis. All variables are described in Table I and the data can be found in <http://iicg.som.yale.edu/>.

Dependent Variable	Log GNP per capita	Employment laws index	Industrial (collective) relations laws index	Social security laws index	Constant	N
Size of the unofficial economy	-5.6140 <sup>a</sup> (0.7158)	2.7803 (4.2001)			72.1584 <sup>a</sup> (10.3888)	85
	-5.8579 <sup>a</sup> (0.6752)		3.0764 (4.0152)		74.6875 <sup>a</sup> (7.3931)	85
	-5.4954 <sup>a</sup> (1.5176)			-1.1091 (3.9874)	77.4555 <sup>a</sup> (7.4541)	85
Employment in the unofficial economy	-5.8747 <sup>a</sup> (1.2083)	11.6837 (7.1306)			65.8202 <sup>a</sup> (16.8673)	46
	-7.9954 <sup>a</sup> (1.0937)		17.6829 <sup>b</sup> (6.9587)		77.5093 <sup>a</sup> (10.1388)	46
	-5.6832 <sup>c</sup> (3.2218)			-2.3049 (8.0633)	87.0109 <sup>a</sup> (13.9918)	46
Male participation rate in the labor force 1990-1994	-1.4984 <sup>a</sup> (0.3087)	-5.3804 <sup>a</sup> (1.4355)			104.0734 <sup>a</sup> (3.9808)	78
	-1.1064 <sup>a</sup> (0.2962)		-3.9469 <sup>a</sup> (1.2706)		97.4255 <sup>a</sup> (2.7837)	78
	0.3670 (0.5571)			5.3238 <sup>a</sup> (1.5187)	89.5162 <sup>a</sup> (2.7715)	78
Female participation rate in the labor force 1990-1994	-2.5327 <sup>b</sup> (1.1788)	-8.5166 (6.4455)			89.7852 <sup>a</sup> (16.3302)	78
	-1.9027 (1.1510)		-7.1619 (6.5154)		80.3408 <sup>a</sup> (12.4055)	78
	-5.9054 <sup>a</sup> (1.5397)			13.8134 <sup>b</sup> (5.2706)	80.3381 <sup>a</sup> (10.0290)	78
Unemployment rate 1991-2000	-0.2420 (0.4585)	4.2867 <sup>b</sup> (1.9782)			4.1597 (6.5087)	65
	-0.6847 <sup>c</sup> (0.3768)		2.9791 <sup>c</sup> (1.7814)		10.8772 <sup>b</sup> (4.4487)	65
	-1.3735 <sup>b</sup> (0.5570)			3.2970 (2.3026)	14.3533 <sup>a</sup> (3.9298)	65
Unemployed males 20-24 years old / active males 20-24 years old 1991-2000	-0.0389 (1.0329)	7.6928 <sup>c</sup> (3.9735)			3.1012 (14.3822)	52
	-1.0110 (0.8073)		3.1269 (2.7761)		19.6347 <sup>b</sup> (9.3442)	52
	-2.9941 <sup>b</sup> (1.1630)			11.7323 <sup>b</sup> (5.3564)	17.9806 <sup>c</sup> (9.1533)	52
Unemployed females 20-24 years old / active females 20-24 years old 1991-2000	-0.7234 (1.6419)	14.4540 <sup>b</sup> (6.4273)			1.6001 (23.3581)	52
	-2.4236 <sup>b</sup> (1.0812)		9.5276 <sup>b</sup> (4.1883)		26.7108 <sup>b</sup> (12.0794)	52
	-3.3250 <sup>b</sup> (1.4426)			3.5791 (6.7401)	40.1832 <sup>a</sup> (12.3809)	52
Average wages of machine operators / wages of clerks and workers in craft and related trades 1990-1999	0.0325 <sup>b</sup> (0.0125)	0.2338 <sup>a</sup> (0.0841)			0.3337 <sup>c</sup> (0.1972)	53
	0.0137 (0.0116)		0.1614 <sup>c</sup> (0.0823)		0.6532 <sup>a</sup> (0.1208)	53
	-0.0164 (0.0222)			0.1040 <sup>c</sup> (0.0609)	0.9240 <sup>a</sup> (0.1066)	53

a=significant at 1 percent level; b=significant at 5 percent level; c=significant at 10 percent level.



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# THE EFFECT OF MANDATED CHILD CARE ON FEMALE WAGES IN CHILE\*

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## Abstract

This paper studies the effect of mandated employer-provided child care on the wages of women hired in large firms in Chile. We use a unique employer-employee database from the country's unemployment insurance (UI) system containing monthly information for all individuals that started a new contract between January 2005 and March 2013. We estimate the impact of the program using regression discontinuity design (RDD) exploiting the fact that child care provision is mandatory for all firms with 20 or more female workers. The results indicate that monthly starting wages of the infra-marginal woman hired in a firm with 20 or more female workers are between 9 and 20 percent below those of female workers hired by the same firm when no requirement of providing child care was imposed.

**Keywords:** Mandated benefits, female wages, regression discontinuity, policies for gender equality.

**JEL codes:** C21, J32, J71, J83

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## 1 Introduction

One of the main characteristics of Chile's labor market is the low labor force participation of women. According to International Labor Organization (ILO) statistics for the period 2011-2013, Chile and Mexico have the lowest participation rate of women in Latin America.<sup>1</sup> The rate in Chile is also below the United States and the average rate for European countries by more than ten percentage points. The situation, however, has shown improvements over the past two decades, with the rate increasing from 31.8 in 1990 to 47.8 in 2012.<sup>2</sup>

Since the return to democratic governance at the end of the 1980s, Chile has formulated several public policies to reduce gender disparities in the labor market by stimulating female hiring, reducing discrimination, and promoting work and family balance (Henriquez and Riquelme, 2011). In the early 1990s, the government created the National Women Service -Servicio Nacional de la Mujer- an institution devoted to the promotion of equal opportunities for men and women in Chile. Since then, a number of laws and programs have been enacted to support women's rights and increase female access to the labor market.

One example is Article 203 of the Labor Code, which mandates that all firms with 20 or more female workers regardless of their age, marital status, or type of contract should provide a place near but independent from the workplace where mothers can leave their children under two years old during the workday and feed them as necessary.<sup>3</sup> The employer must offer the service in a separate facility near the workplace, pay an external provider directly, or provide additional compensation to the female employee to cover the expense. The government must approve all child care centers through its National Board of Daycare Centers (the Junta Nacional de Jardines Infantiles, or JUNJI). This law supports the mothers transition back to work, while promoting the close motherchild relationship and the healthy development of the child. It is well know that problems with securing and affording child care can create conflict in the workfamily balance, and to the extent that this can lead to lost work days, the choice to give up paid work temporarily, or

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<sup>1</sup>LABORSTA database downloaded on December 1st 2014. We compared female labor force participation rates in Chile with those in the following countries: Argentina, Bolivia, Brazil, Colombia, Jamaica, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela.

<sup>2</sup>According to the statistics presented in KILM/ILO 8th Edition, which are based on LABORSTA until 1995 and on OECD Labour force Statistics Database from then onward.

<sup>3</sup>The first law regulating the provision of child care to employees dates back to 1917 (Law 3186). Since then the law has been subject to several modifications (1993, 1995, 1998, 2002, 2007 and 2009), which are reflected in the current version of Article 203.

job loss, child care is implicated in reduced wages for mothers.

Aside from the potential positive impact of the policy on labor supply decisions, the immediate effect of the law is an increase in the cost associated with hiring and employing women. In fact, it creates a wedge between the labor costs of females and males, implying a new source of gender disparities. Standard economic theory suggests that the labor market effect of mandated legislation will be concentrated in employment with no change in wages. However, some effect on wages may be expected given the importance of child care in shaping employment decision of females.

The objective of this paper is to quantify the effect of the mandated employer-provided child care on the starting wages of women hired in large firms in Chile. The focus is on large firms because for small and medium firms compliance with the law is not high enough to obtain an accurate estimation of the wage adjustments made in response to the law. In particular, we concentrate on the wages of new female employees because the wage adjustment is more flexible in this case than for active workers.

We use a unique employer-employee database from the unemployment insurance (UI) system containing monthly information for all individuals that started a new contract between October 2002 and March 2013. We exploit the availability of longitudinal data to analyze the impact of the law on firm-specific new hires, those leading firms to cross the threshold of 20 female workers. Our results indicate that the policy has sizable effects on starting wages of women working in large firms created after 2005. Specifically, women hired in a firm with 20 or more female workers make CLP\$24,000 to CLP\$53,000 (approximately US\$39-US\$87) less than women hired when no requirement of providing child care was imposed (i.e., when firm has less than 20 female workers).<sup>4</sup>

The paper contributes to three strands of the literature. First, it informs on the effects of labor market regulations on wages, more precisely, on the effects of group-specific mandated benefits on group's wages. Identifying this pass-through is critical for understanding the efficacy of the policy. Second, the paper contributes to the debate on the unintended consequences of public policies in general and policies aimed to promote gender equality in particular. Third, the paper adds to the literature that analyzes the impact of non-linearities in legislation and their impact on labor market flexibility, especially those that have dynamic implications.

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<sup>4</sup>Values are expressed in 2009 Chilean pesos. Values in dollars computed using the exchange rate in effect on April 2015 of 609.89 Chilean pesos per US dollar.

This paper offers a unique contribution to the recent analysis of the effect of mandated child care benefits in Chile. By using longitudinal data, it provides a precise estimate of the effect of the law on wages by following firms as they grow over time and compare individual wages within a firm before and after crossing the threshold. We discuss how the trivial comparison of firms above and below the threshold at a given point in time ignores fundamental differences across firms, which may bias the estimates in unpredictable ways.

The document is organized into seven parts. The second section summarizes the literature of the effects of mandatory legislation on the labor market. The third section describes the data used. The fourth section presents the conceptual framework. The fifth section explains in detail the empirical strategy of the paper. The sixth section presents the main results. Section seven concludes.

## 2 Effect of Mandatory Legislation on the Labor Market

Under the standard neoclassical labor demand-labor supply framework, mandatory legislation that increases labor costs reduces employment with no change in wages. This result is explained by the assumption of a perfectly elastic labor supply. Then, the cost is entirely paid by the employer. In the context of a not perfectly elastic supply of labor, however, part of the increase in labor costs will reduce wages, and thus, the effect on the labor market will be limited. In addition, the employee valuation of the benefit is important to determine its effect on wages and employment, since it determines whether workers accept lower wages when receiving mandated benefits.

Summers (1989) points out that “in terms of their allocational effects on employment, mandated benefits represent a tax at a rate equal to the difference between the employers cost of providing the benefit and the employee’s valuation”. Thus, in the limit and in the absence of asymmetric information between workers and firms, wage rigidity, or credit constraints, mandated benefits are borne by the workers in the form of lower wages, and have no effect on employment (e.g., Summers, 1989; Gruber and Krueger, 1991; Gruber, 1994). The extent to which the cost of mandatory legislation is translated into lower wages is an empirical question.

Several empirical papers provide evidence of a large effect of payroll taxes and mandated benefits on wages. For the United States Gruber and Krueger (1991) study the incidence of increases in the

cost of workers' compensation (referring specifically to insurance for workplace injuries) and find that 85 percent of the cost of the mandated employer-provided insurance shift to wages, with limited disemployment effect.

Similarly, Gruber (1994) analyzes the effects of mandated maternity benefits in the United States and, using a difference-in-difference estimation, finds that a large share of the cost is shifted to wages with only minor disemployment effects. In fact, Gruber finds that legislation causes young women's wages to fall by as much as 5 percent with no effect on their labor supply, suggesting a 100 percent pass-through rate.<sup>5</sup>

In the context of Latin America, most of the evidence uses the dramatic shifts in policy regimes that took place during the decade of reforms that started in the late 1980s and early 1990s. Heckman and Pagés (2004) present a comprehensive summary of the evidence on wage shifts for the region. In the case of Ecuador, they highlight the work of MacIsaac and Rama (1997), documenting that part of the increase in labor cost associated with mandated contributions to social security programs is shifted to workers in the form of lower base wages (i.e., the foundation on which benefits are paid). In fact, for an average cost of social security contributions and other mandated benefits that amounts at least 57 percent of the base wage, the authors find a 39 percent reduction in the base earnings of workers in firms that comply with these regulations compared with workers at non-compliant firms. Their empirical strategy consists in including a dummy variable that identifies compliant firms into the estimation of a wage equation using the Living Standards Measurement Study (LSMS) of 1994. The regression is performed on take-home wages and base wages controlling for individual variables (education, experience, gender, marital status, dummies for indigenous, urban and other geographical variables) and characteristics of the firm (dummies for modern, public, agriculture and unionization).

Mondino and Montoya (2004) analyze the effect of labor market regulations in Argentina during the period 1975-1996. Similar to MacIsaac and Rama (1997), they compare wages of workers who have access to social security programs with wages of uncovered workers; in the estimation of the wage equation, however, they control for the difference between the decision to participate in a job

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<sup>5</sup>Not all empirical papers find evidence of large effects on wages. Baum (2003) finds little effect of maternity leave legislation on either employment rates or wages. He uses interstate variation in legislation and the Family and Medical Leave Act (FMLA) signed in 1993 by President Clinton. His results may be due to fact that the mandated leave is short and unpaid, and many employers provided maternity leave benefits prior to the statutes.

search and that of accepting a job offer. They find that the gross wages of non-covered workers were 8 percent higher than those of covered workers.

In the case of Mexico, Marrufo (2001) examines the effects of the 1997 pension reform. After decomposing the effect of the reforms into the effect of a tax reduction and the effect of tying benefits to contributions, Marrufo finds that wages absorb 43 percent of the increase in social security taxes and 57 percent of the value of benefits. She controls for self-selection and also accounts for general equilibrium effects to overcome the problems with the difference-in-difference estimates that understate the true extent of wage adjustment.

Finally, in the case of Chile, Gruber (1997) uses the sharp exogenous reduction in employer-paid labor taxes produced by the privatization of the social security system to estimate its effect on the labor market. Gruber's estimates point to a 100 percent pass-through rate. As Heckman and Pagés (2004) point out, there are several caveats for his estimates. First, with the decline in payroll taxes, workers' contributions also increased and if measured wage payments by firms include employee contributions, then the higher measured wages will capture not only the effect of lower employer-paid taxes but also the higher employee-paid contributions. Second, measurement errors in the wage bill and tax payments may bias the estimates toward full shifting.

Using data from the 1994's national survey of socioeconomic conditions (Encuesta de Caracterización Socioeconómica Nacional-CASEN), Edwards and Cox-Edwards (2000) analyze the effect of a social security reform on labor market outcomes in Chile. The authors estimate a wage equation controlling for the decision to contribute to the social security system. They find that take-home wages for workers covered by mandatory pension, health, and life insurance were 9 percent lower than wages for non-covered workers. Using the fact that in 1994 social security contributions amounted to 20 percent of wages and were nominally paid by workers, their estimates suggest that the workers absorbed about 45 percent of the cost of the contributions in the form of lower wages, while the other 55 percent fell on employers.

As previously stated, these estimates of large pass-through rates rely on the absence of asymmetric information between workers and firms, wage rigidity, or credit constraints. While these assumptions may hold at the top of the wage distribution, they are unlikely to be true at the bottom, which implies lower shifts of the costs to wages. One important factor in the context of Latin America is the downward wage rigidity at the bottom of the distribution; thus, it is cru-

cial for the analysis to evaluate whether minimum wage binds. For example, Maloney and Nunez (2004) document that the minimum wage binds in Colombia, which is consistent with the weak pass-through effects found by Cardenas and Bernal (2004) for the country. In the case of Chile, it will be interesting to determine whether the results of Gruber (1997) were driven by the fact that the minimum wage does not bind or by the specificity of the study.

However, some of the theoretical predictions for general mandates may not hold in the case of group-specific mandates, such as the one we are considering for Chile. Gruber (1994, 1997) points out that the scope for wage adjustment might be more limited due to barriers to adjust relative wages. In addition, even with barriers for wage shifting, these mandates may discourage hiring of new employees belonging to the specific group, as employers seek to hire workers with lower benefit costs, altering the dynamics of the labor market. Thus, mandated benefit programs might work against the interests of those who most require the benefit being offered.

Two other papers analyze the effect of child care mandated benefits in Chile. Escobar (2014) uses data from the annual survey of manufacturing firms -Encuesta Nacional Industrial Anual (ENIA)- covering the period 1995-2007 to estimate the effect of Article 203 on firm's hiring decisions. In particular, he assesses the extent to which firms substitute female labor with male labor or capital to avoid the cost associated with the law. He documents the presence of concentration of firms below the threshold of 20 female workers, and no effects of the law on average wages per worker. Unfortunately, unlike the data used in this paper, ENIA does not contain worker-level data and only gathers information on a specific sector. This prevents a disaggregated dynamic analysis of wages by gender, limiting the scope of the findings regarding the wage adjustment. Our results confirm these limitations.

Villena et al. (2015) use a cross sectional sample (October 2010) from the same data analyzed in this paper to estimate the effect of the same law on wages. They focus on firms with more than 5 and less than 35 female workers and restrict the analysis to three industries. Based on a regression discontinuity approach implemented in a static framework, they find that firms shift the cost of mandated child care benefits to all workers -both females and males. The estimated local static average effect is a 4 percent reduction in wages of active workers. The small magnitude of this effect contrasts to the large effects presented in our paper. Several reasons explain these differences. First, Villena et al. (2015) does not take into account the evidence of limited compliance with

the law among small and medium size firms. Second, their static empirical analysis ignores firm dynamics. As we show, high frequency hires and dismissals changing the position of the firm with respect to the threshold are extremely common in Chile. This affects the interpretation of the static findings. In this paper, we deal with this challenge by analyzing individual hires over time at the firm level.<sup>6</sup> Third, average effects obtained from cross-sectional variation across firms overlook the importance of firm heterogeneity. In contrast to the analysis of Villena et al. (2015), our dynamic set up controls for firm-specific fixed effects. To the best of our knowledge, this is the first paper addressing the impact of child care mandated benefits labor legislation taking into account both dynamic firm behavior and firm-level heterogeneity.

### 3 Data Description

The database from the country’s unemployment insurance (UI) system -Seguro de Cesantía- includes information on the demographic characteristics of individuals (e.g., age, gender, education, marital status) and their geographic location. It also contains information from the firms where the individuals work, such as salary history, type of contract, sector of activity, and hiring date. The size of the firm (number of workers) is computed by counting the number of registered workers in each firm. The employer collects the information and must submit it to the institution that administers the pension system in Chile (Administradora de Fondos de Cesantía, or AFC). This procedure is mandatory for all contracts that started after October 2, 2002. Workers that were already working before this date can enter voluntarily into the system. Once an individual is registered in the system, the information is updated on a monthly basis, even if the individual changes his or her employer.

Motivated by the nature of our main question and by some challenges of the data, we use a subsample of the firms that guarantees the accuracy of our estimates. We concentrate on *large and new firms*. Firms are classified as *large* if they employ 200 or more workers in a calendar year.<sup>7</sup> The definition of *new* is based on the date of creation, so firms are classified as new if they registered a new contract for the first time in 2005. As a result, the period of analysis is 2005-2013. Each

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<sup>6</sup>For example, using data from the Chilean unemployment insurance (UI) system, we calculated that 40 percent of the firms with less than 20 female workers in a given month, eventually pass the threshold within a year. Furthermore, around 14 percent of these firms pass the threshold in the next month.

<sup>7</sup>We compute the number of workers per firm on an annual basis.

decision is related to some features of the data, so we present the arguments for the selection of the sample as a response to overcome three main challenges.

First, the data do not contain information on the actual provision of child care; this is an important challenge because there is no perfect compliance with the law. In a situation of perfect compliance, we could rely exclusively on the number of female workers to classify firms facing the obligation to pay for child care services from those not facing such an obligation.

To overcome this challenge, we restrict the analysis to *large* firms because these firms are more likely to observe the law than small and medium firms. According to the 2011 National Labor Survey (Encla 2011), 28 percent of firms with more than 20 female workers do not comply with the law to provide child care services, a figure concentrated mainly in small and medium firms. In contrast, 90 percent of large firms provide child care services to their employees Dirección del Trabajo (2012).<sup>8</sup> Also, large firms are subject to more stringent vigilance and control.

Columns 1 and 2 in Table 1 compare the sample of large firms with all the firms available in the data. Large firms represent less than 1 percent of all the firms in the data, but they are highly representative of the firms that are mandated to provide child care services to their employees.<sup>9</sup> Based on the 2008 National Labor Study (Encla, 2008), large firms comprise 63 percent of all firms complying to the law (Dirección del Trabajo, 2008).<sup>10</sup> In addition, as presented in Table 1, while only a very small fraction of the firms in the data crosses the threshold of having 20 female workers, 75 percent of large firms at some point cross the threshold between 2002 and 2013. For these firms, we observe the starting wages of all new female workers as the firm approaches the threshold. We exploit this feature of the data in our empirical approach.

[Table 1 about here.]

The second challenge of the UI data is the uncertainty about the total number of workers for some firms. Our data contain very rich information on all new contracts that started after October 2, 2002, when the law mandated that they be registered into the system. Workers with contracts before

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<sup>8</sup>This percentage corresponds to firms that have 20 or more female workers and at least one with children at the eligible age range. The survey has detailed information on 3,153 firms 79,786 using sampling weights. The sample is representative by region and size of firm. The sample, which comes from the National Revenue Service, includes all the firms in the national territory that paid taxes in 2009. For more information, see Dirección del Trabajo (2012).

<sup>9</sup>70.31 percent of all the firms in the data have less than 5 workers; 13.3 percent have 5 to 9 workers; 12.8 percent have between 10 and 49 workers; and 2.7 percent have 50 and 199 workers.

<sup>10</sup>In 2008, the ENCLA had a specific module to analyze child care provision and compliance with the law.

October 2002 have not been automatically entered. They can, however, be entered voluntarily into the system. Consequently, there is no guarantee that the number of workers registered in the system coincides with the actual number of workers in each firm. To overcome the challenge created by the uncertainty in the total number of workers in general, and the total number of female workers in particular, we use only *new* firms.<sup>11</sup> We restrict the analysis to new firms because we can follow their expansion and have certainty that all workers are registered in the system and appear in the data. Finally, we compute the number of workers per firm on an annual basis. Each decision is related to some features of the data, so we present the arguments for the selection of the sample as a response to overcome three main challenges.

Columns 3 and 4 in Table 1 present basic descriptive statistics on new firms and firms that are both new and large. Our final sample uses information on new hires in this subsample of 1,912 firms. This selection of the sample reduces the external validity of our results in the sense that we are not including the complete universe of firms in Chile, but we gain confidence in the precision of our estimates.

The third challenge is the presence of large variations in the total number of workers in a firm within a year. Having monthly data is definitively an advantage for our study, but the registration process and actualization of the information do not necessarily coincide with the monthly frequency. In some cases the frequency mismatch responds to the typical timing of the registration process of registration for new employees (minimum 3 to 4 months). In other cases, it responds to the possibility of avoiding monthly actualization of the information in the system. In consequence, the number of employees recorded in the system in a given month may not coincide with the real number of workers in the firm.<sup>12</sup> To overcome this issue, we use the maximum number of workers observed in a year in each firm, as the variable that determines whether or not the firm is mandated to provide child care services to its employees.

Finally, since we are interested in comparing the wage of females in the margin as the firm

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<sup>11</sup>The sample contains 525,181 new firms, which accounts for nearly 63 percent of the 837,899 firms in the sample.

<sup>12</sup>For example, when a new person is hired, employers must submit his or her information to the institution that administers the pension system in Chile (Administradora de Fondos de Censatias-AFC) within 10 days. Between the actual hiring date and the date the individual appears in the system, however, there is a window of three months (date of hiring, report the new employee, first payment, creation of account, and next wage). Regarding the actualization of information, it is possible that some individuals do not appear every month in the data due to a delay in paying the monthly contributions. In theory, once an individual is registered in the system, the information is updated on a monthly basis because the contributions must be paid every month. However there is a window of 90 days before firms have to pay the penalty fee associated with the delay.

approaches the threshold of 20 female workers, we restrict the analysis to the starting wage of each woman in each firm.<sup>13</sup> As a result, the outcome of interest is the wage offered to (and accepted by) a woman in a firm that is very close to having a total of 20 female workers. Ideally, we would like to analyze only the starting wage of the 20th female, since that is exactly the point of discontinuity. In reality, we are close to that ideal because the data include all new contracts that started after October 2002 and, by concentrating on new firms, we may be able to observe the hiring of the 20th female worker.

Table 2 presents the description of the data on females hired for the first time in large new firms. “N\_workers” is the average of the number of workers employed in the firm hiring new female workers over the period 2005-2013; “N\_female workers” is the average number of female workers employed in the firm where the individual was hired; the analogous is true for “N\_male workers”; “Starting wage” for female workers is the average of the real starting wage in Chilean pesos of 2009 for the females in the sample; “Average wage females/males firm” corresponds to the average wage of female or male workers working at the firm where the female was hired; “Above” is a dummy variable for the firms with twenty or more female workers: the number of observations corresponds to individual hires and “N\_firms” is the number of firms considered.

[Table 2 about here.]

## 4 Conceptual Framework: Firm’s Behavior at the Margin

One important consideration is the discontinuous nature of the policy. Unlike standard mandates, the increase in the labor costs associated with hiring females only activates when the firm reaches the threshold of 20 female workers. This section briefly discusses the behavior of the firm at the margin.

Assume the firm only has two inputs in production: female workers  $f$  and male workers  $m$ . The production function is described as follows:

$$Q = F(f, m; \theta)$$

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<sup>13</sup>In this context, if one woman is hired by different firms, we include her as multiple observations of starting wages.

where  $\theta$  is a parameter that summarizes all other characteristics of the production process.

Given the prices of the inputs,  $w_f$  and  $w_m$ , the price taker firm maximizes profits. The first order conditions are:

$$w_f = F_f(f, m; \theta)$$

$$w_m = F_m(f, m; \theta)$$

As a result, the optimal allocation of workers given the relative prices is given by:

$$\frac{w_m}{w_f} = \frac{F_m(f, m; \theta)}{F_f(f, m; \theta)} \quad (1)$$

If the production function exhibits constant returns to scale, equation (1) can be expressed as follows:

$$\begin{aligned} \frac{w_m}{w_f} &= \frac{F_m(m/f, 1; \theta)}{F_f(1, m/f; \theta)} \\ &= \kappa(m/f; \theta) \\ &= \kappa(R; \theta) \end{aligned}$$

In this context, the policy affects the cost of female labor, acting as a tax. The wage of females in firms with 20 or more female workers will be  $\tilde{w}_f = w_f + \tau$ . In consequence, the optimal selection of inputs will be given by:

$$\frac{\tilde{w}_m}{w_f} = \kappa(\tilde{R}; \theta) \quad (2)$$

A firm with 19 female workers will experience a change in relative wages. In response, the profit maximizing behavior implies adjusting the optimal fraction of male to female workers, changing from  $R$  to  $\tilde{R}$ . Without the policy, the firm would continue increasing the scale of production without changing the optimal ratio of male to female workers  $R$ .

In the process of expansion, a firm in the margin faces two options to increase the scale of production. The first alternative is to substitute female workers with male workers, to avoid the change in relative prices implied by the policy (not hiring the 20th female worker). This option implies altering the optimal combination of inputs and, as a result, it has a direct impact on employment levels and is associated with the concentration of firms just before the before the

threshold is reached. This concentration is referred in the literature as “bunching”. The viability of this option, however, depends on the elasticity of substitution between female and male labor.

The second alternative is to hire the 20th female worker and pay the additional cost associated while maintaining the optimal ratio of male to female workers. In this paper, we are interested in quantifying the effect of the policy on female wages.

## 5 Empirical Framework: Sharp RDD with Firm-specific Fixed Effects

The empirical strategy employed in this paper is a “sharp” regression discontinuity design (RDD). This strategy is used to compute the causal effect of the legislation on the outcome of interest, i.e., the starting wage of women working in large firms in Chile between 2005 and 2013.

Using the basic setting for the Rubin Causal Model (RCM) the outcome observed can be written as:

$$w_i = \begin{cases} w_i(0) & \text{if } D_i = 0 \\ w_i(1) & \text{if } D_i = 1 \end{cases} = w_0(1 - D_i) + w_1 D_i$$

$$D_i = \mathbf{1}\{F_i \geq 20\}$$

where  $w_i(0)$  represents the wage for female workers without exposure to the treatment,  $D_i = 0$  (i.e., women working in firms with less than 20 female workers);  $F_i < 20$  and thus, not receiving child care services by their employers;  $w_i(1)$  is then the wage given exposure to the treatment, i.e., for women working in firms with 20 or more female workers and in consequence, receiving employer-paid child care services for their children under two years of age.

We are interested in the average causal effect of the treatment at the discontinuity point:

$$\tau = E[w_i(1) - w_i(0) | F_i = 20] \quad (3)$$

To determine the validity of our approach we need to ensure that at least four basic assumptions for RD are satisfied (see Nichols, 2007). The first assumption is that the treatment is not randomly assigned. This assumption is satisfied because only firms with 20 or more female workers are

mandated to provide child care services to their female employees, an observable variable. In addition, we restrict the analysis to large firms where the compliance to the law is high to ensure that provision of child care is a deterministic function of the number of women working at the firm.

The second assumption is the presence of a discontinuity in the wage of females when the number of female workers is 20, so the selection on observables at the threshold is also satisfied. Figure 1 presents the average of the starting wage for females by the number of women working at the firm where they were hired.<sup>14</sup>

[Figure 1 about here.]

The third assumption is that there is no manipulation of the running variable. Finally, the fourth assumption requires that the other variables -demographic characteristics and characteristics of the firm where the individual is employed- are smooth functions of the assignment variable conditional on treatment -that is, the only reason the outcome variable should jump at the threshold is due to the discontinuity in the level of treatment.

To discuss in detail the last two assumptions, we introduce some additional notation. In this case the running variable -number of female workers- is discrete so the conditions for non-parametric or semiparametric methods are not satisfied. Instead we regress  $w_{ij}$  on a low-order polynomial in  $F_{ij}$ . According to Lee (2008a) if the polynomial function correct the conventional ordinary least squares (OLS) inference is appropriate.<sup>15</sup>

$$w_{ij} = \alpha + G(\tilde{F}_{ij}) + D_i * G_p(\tilde{F}_{ij}) + \tau D_i + \gamma_j + \epsilon \quad (4)$$

$$\text{where } \tilde{F}_{ij} = F_{ij} - 20,$$

and  $G_p(\tilde{F}_{ij})$  is a  $p$  order polynomial with  $G_p(\tilde{F}_{ij}) = \beta_0 \tilde{F}_{ij} + \beta_1 \tilde{F}_{ij}^2 + \dots + \beta_p \tilde{F}_{ij}^p$ ,  $D_i * G_p(\tilde{F}_{ij})$  that allows different polynomials on the two sides of the discontinuity,  $\gamma_j$  captures firm-level fixed effects and  $\tau$  is the variable of interest.

<sup>14</sup>As a robustness check, we present the analogous figure in Figure 5, but for the starting wages of male workers. As expected, no discontinuity is present. In the same spirit, Figures 6 and 7 test for discontinuities around a different cutoff point, 15 and 25 female workers. As expected, there is no discontinuity in starting female wages around different cutoffs.

<sup>15</sup>Some authors have followed a similar approach (e.e., Lee, 2008b). For a discussion on the methodology and one alternative procedure for inference refer to Lee (2008a).

In principle, the expected discrete change in the provision of child care services mandated by the law encourages the use of RDD to estimate the causal effect of the program on wages. The intuition behind this strategy is that firms that lie just below the threshold and firms that lie just above the threshold are statistically comparable except for the fact that one group of firms is mandated to offer child care service to its female employees and the other group of firms is not. As a result, any discontinuity in the conditional distribution of wages at the threshold could be interpreted as the effect of the law.

The running variable in this case, however, is the maximum number of females working in the firm within a year. In theory, as a result of the optimization problem, firms decide the number of employees and the wage. So, a given firm may reduce its labor cost by not hiring (or firing) the 20th woman, because it is not longer mandated to provide child care services to its female employees. The endogeneity of the running variable creates a threat for identification and, in consequence, a threat for the validity of RDD estimates to reflect the causal effect of the law on wages.

We exploit the availability of longitudinal data to analyze the impact of the law on firm-specific new hires, those leading firms to cross the threshold. One key observation is that large firms tend to cross the threshold at some point. The substitution strategy is not sustainable in the long run for these firms. An evidence of this behavior in our data is that only 24 percent of large and new firms are below the threshold of 20 female workers for the whole period (2005-2013).<sup>16</sup> As a result, the distinction between firms that are below the threshold and those that are above it vanishes in the presence of longitudinal data, reducing the threat to the identification strategy. To justify the identification strategy, we need to formally test for manipulation on the running variable and demonstrate that women hired when the firm is below the threshold are statistically comparable to those hired when the firm is just above the threshold, except for the fact that one group receives employer-paid child care services while the other group does not.

### **Testing for Manipulation in the Running Variable**

A simple graphical test shows the lack of evidence on firms bunching just before reaching the threshold of 20 female workers and the lack of discontinuities in the distribution of firms by the

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<sup>16</sup>An important fraction of these firms are new firms created in the last two years, which means that the percentage of firms that never cross the threshold would be lower if we control for truncation.

number of female workers. Figure 2 presents the density of firms (new and large) by the number of female workers using both monthly and annual frequency data. In both cases, we observe more mass below than above the cutoff and a tendency but no discontinuity around the cutoff point.

[Figure 2 about here.]

We use a discrete-adjusted version of the test proposed by McCrary (2008) to formally test for potential manipulation of the running variable. This test consists in computing an estimator for the size of discontinuity around the cutoff in the density function of the running variable.

Table 3 presents the estimation of the coefficient associated with a dummy variable indicating whether the firm has 20 or more female workers  $D$ . We estimate a regression of the (log) of the frequency of firms on a low-order polynomial in the number of female workers  $\tilde{F}_{ij}$  and  $D$ . We present estimates for two specifications, one using a polynomial of degree 2 and another using a polynomial of degree 5.<sup>17</sup> We do not compute bandwidths in our parametric approach, but we still need to restrict the regression to the observations that are close to the threshold. For that reason, we present estimates using two different subsamples. The first subsample corresponds to firms with 10 to 30 female workers (Window N\_females=10), and the second to firms with 5 to 35 female workers (Window N\_females=15). In all cases, we present the results with and without additional controls for the average number of workers and the average wage for female and male workers.

We find no evidence of a statistically significant discontinuity in the distribution of firms around the cutoff point. This is true for all the specifications presented. The lack of evidence of bunching is important to justify the validity of our RDD results.<sup>18</sup>

[Table 3 about here.]

## Testing for Discontinuities in Observable Characteristics Around the Cutoff

Our identification strategy compares starting wages of females hired when firms are just below the threshold with the starting wages of females hired right after the firms crosses it. In this context, we need to ensure that women hired when the firm is just below and just above the threshold are

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<sup>17</sup>We test the fit of the polynomial functional form using a simple goodness of fit test after a graphical analysis of the data. In general, the best fit is attained with polynomials degree 2 and 5, we present the two extreme values but, we prefer the specification with the polynomial with the lowest degree following Gelman and Imbens (2014).

<sup>18</sup>Escobar (2014) finds that manufacturing firms tend to concentrate below the threshold of twenty workers but we finds no evidence of bunching at 19 female workers.

statistically comparable except for the fact that one group receives employer-paid child care services and the other group does not. If this is true, any discontinuity in the conditional distribution of wages at the threshold could be interpreted as the effect of the law. For this purpose, we test for discontinuities in observable characteristics, demographic characteristics, and characteristics of the firm around the threshold.

Figures 3 and 4 present the results of running polynomial regressions on different characteristics of both the individuals and the firms near the cutoff point. The fact that we observe multiple first-time hires in different firms at different times -including the same woman on different dates- help us to ensure the plausibility of the assumptions. The figures evidence that the available covariates (age, marital status, highest completed degree, type of contract and size of the firm) are smooth functions of the assignment variable, conditional on treatment. In consequence, the only reason for the outcome variable to jump at the cutoff is the discontinuity in the level of treatment.

We find that the average age is a decreasing function of the number of female workers in the firm. This should not represent a problem since we are using a local estimation. If we consider that wages increase with age (experience, tenure, etc.), having a relatively older composition of the treatment group would imply that the difference with the control group is even higher than estimated (considering that starting wages increase with age).<sup>19</sup>

[Figure 3 about here.]

[Figure 4 about here.]

Our tests cannot rule out the presence of differences in unobservables such as ability, which in general is associated with higher wages. In that case our estimates would be a lower bound of the total effect.

## 6 Results

Table 4 presents the results of the estimation associated with the regression presented in Equation 4. We test the fit of the polynomial functional form using a simple goodness of fit test after a graphical analysis of the data. In general, the best fit is attained with polynomials of degree

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<sup>19</sup>Note that RDD does not require these characteristics to be uncorrelated with wages, RDD only requires this characteristics do not have a discontinuous effect on wages (Nichols, 2007).

2, 3 and 4. The results are fairly constant across specifications but as a general rule we prefer specification associated to the polynomial with the lowest degree following Gelman and Imbens (2014).

We present estimates corresponding to two different ranges of data. In the first case, we use females hired for the first time in firms with 10 to 30 female workers. In the second case we use a broader window of 15 female workers around the cutoff point. In all cases, we present the results with and without additional controls for age, age squared, type of contract, schooling, year hired, and region of residence.<sup>20</sup> Although the results are not very different, it is useful to evaluate the impact of controlling for other variables that affect starting wages.

In principle, if the identification strategy is valid, covariates should be redundant. According to Imbens and Lemieux (2008), however, including covariates may be useful to eliminate small sample biases present in the basic specification, and improve the precision. In addition, they can be useful for evaluating the plausibility of the identification strategy.

On the other hand, Nichols (2007) considers that including covariates is generally a very bad idea. Although the covariates may improve efficiency by reducing residual variance, they could also reduce efficiency due to estimation error in their coefficients. In addition, any violations of the assumptions that such covariates are exogenous and have a linear impact on mean treatment and outcomes could greatly increase bias. The estimate of the effect slightly decreases in magnitude and is less precise after controlling for covariates.

[Table 4 about here.]

Our results indicate that women hired in large firms of 20 or more female workers with mandatory employer-paid child care services are penalized with lower starting wages compared with the wages of women hired in firms with no such requirements. The size of the difference ranges between CLP\$24,000 to CLP\$53,000 (US\$39-US\$87) depending on the specification.<sup>21</sup>

The appendix presents the results of our estimation using different sizes of firms to confirm that only large firms adjust starting wages in reaction to the policy. More precisely, in firms with 20-50 workers (small to medium according to the traditional categories used in the country) we do not

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<sup>20</sup>There is no consensus on the convenience of controlling for other variables.

<sup>21</sup>Values expressed in Chilean pesos of 2009. Values in dollars computed using the exchange rate in effect on April 2015 of 609.89 Chilean pesos per US dollar.

find any statistically significant difference in starting wages of females. (see Tables 5 and 6). The estimated effects increase when we restrict the sample to firms with 100 or more workers, but the magnitude is smaller compared to our results for large firms -following the traditional definition of 200 or more workers- (see Table 7).

As a robustness check, we also present results for firms with 250 or more workers (see Table 8). These results are in line with the observation that only large firms comply with the law and in consequence adjust starting wages accordingly. It is also consistent with the observation that larger firms are subject to stringent vigilance and control procedures.

The most conservative way of interpreting the results is as a lower bound of the total effect of the legislation on the wages of females working at large firms. The imperfect compliance with the law is likely to be associated with an underestimation of the difference in wages between women working at firms with mandatory employer-paid child care services and women working at firms without this requirement. We assume that all large firms that employ 20 or more workers are paying for child care services when, in fact, 10 percent of firms do not comply with the law. Women hired in noncompliant firms should not experience any effect on their wage. If we were able to remove those observations, the average wage of female workers above the threshold will be even lower, which implies a larger difference with the wage of females below the threshold.

Considering the reported average per capita monthly cost of providing child care services (CLP\$75.000 -CLP\$100.000) the results at first sight may suggest a low degree of pass-through.<sup>22</sup> Nevertheless, to analyze the results in perspective, it is important to consider that the cost of child care provision is only paid to the women with young children, while the wages include all registered female workers. In addition, the present estimates only consider starting wages. Given the importance of initial conditions on future wages, the effect of the policy must be analyzed not only in terms of the magnitude in a given period, but also in terms of the long-run consequences implied. In particular, a low starting wage is highly correlated with lower future wages.

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<sup>22</sup>The cost of child care service provision from (Dirección del Trabajo, 2008). Values are expressed in Chilean pesos of 2008.

## 7 Conclusions

The present document quantifies the impact of mandated provision of child care services in Chile finding sizable effects on the starting wages of female employees. This is not surprising, given that mandated benefits can be interpreted as a tax. As Summers (1989) points out, the tax rate is equal to the difference between the employer's cost of providing the benefit and the employee's valuation. Since it is difficult to compute precisely the employee's valuation, we estimate the extent to which the cost of mandatory legislation translates into lower wages -specifically, lower starting wages.

Our results indicate that women hired in firms with mandatory employer-paid child care services are penalized with lower starting wages compared with the wages of their counterparts hired with no such requirements. As presented in Table 3, the size of the difference in large firms created after 2005 ranges between CLP\$24,000 to CLP\$53,000 (US\$39-US\$87) depending on the specification.<sup>23</sup> These numbers represent between 9 and 20 percent of the average starting wage of women hired in firms below the threshold of 20 female workers.

As a caution note, it is important to clarify that this paper concentrates on one margin of the adjustment: starting wages of female workers. We estimate the size of the adjustment for large firms when they decide to cross the threshold of 20 female workers. In consequence, our results may not be interpreted as evidence for the lack of adjustment through substitution of workers by gender. The law may have an important impact on the hiring patterns of other firms that never cross the threshold (e.g., medium-sized firms). This analysis is more difficult to perform rigorously, however, considering the low compliance with the law by those firms.

This paper highlights the adverse unintended effects of a law for the group that is intended to benefit from it. The objective of the law is to guarantee the right of working mothers to have child care services and to promote the child-mother close relationship and healthy development of the children, as well as reduce gender disparities in the labor market. The law creates a distortion, however, affecting differentially the cost of hiring women. This creates a wage disadvantage for women, lower incentives to participate, and higher gender disparities. Finally, considering the importance of starting wages on future wages, computing the long-run effects of the lower starting wages for women may be an interesting extension of the present paper.

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<sup>23</sup>Values expressed in Chilean pesos of 2009. Values in dollars computed using the exchange rate in effect on April 2015 of 609.89 Chilean pesos per US dollar.

## 8 Appendix

### Robustness Checks

#### Graphical Discontinuity Test: Different Cutoffs and Different Populations

As a robustness check, we present check the presence of any discontinuities in the starting wages of male workers. As expected, no discontinuity is present. In the same spirit, we test for discontinuities around a different cutoff point, 15 and 25 female workers. As expected, there is no discontinuity in starting female wages around different cutoffs.

[Figure 5 about here.]

[Figure 6 about here.]

[Figure 7 about here.]

#### Results Variations on Size of the Firm

[Table 5 about here.]

[Table 6 about here.]

[Table 7 about here.]

[Table 8 about here.]

#### Results from Using Nonparametrical Approach

Estimates for large and new firms are presented in Table 9. Controlling for the uncertainty on the total number of workers produce a slightly higher, but less precise, results. In particular, the estimated effect oscillates between CLP\$26,780 and CLP\$40,643 in starting wages.<sup>24</sup>

[Table 9 about here.]

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<sup>24</sup>Values expressed in Chilean pesos of 2009.

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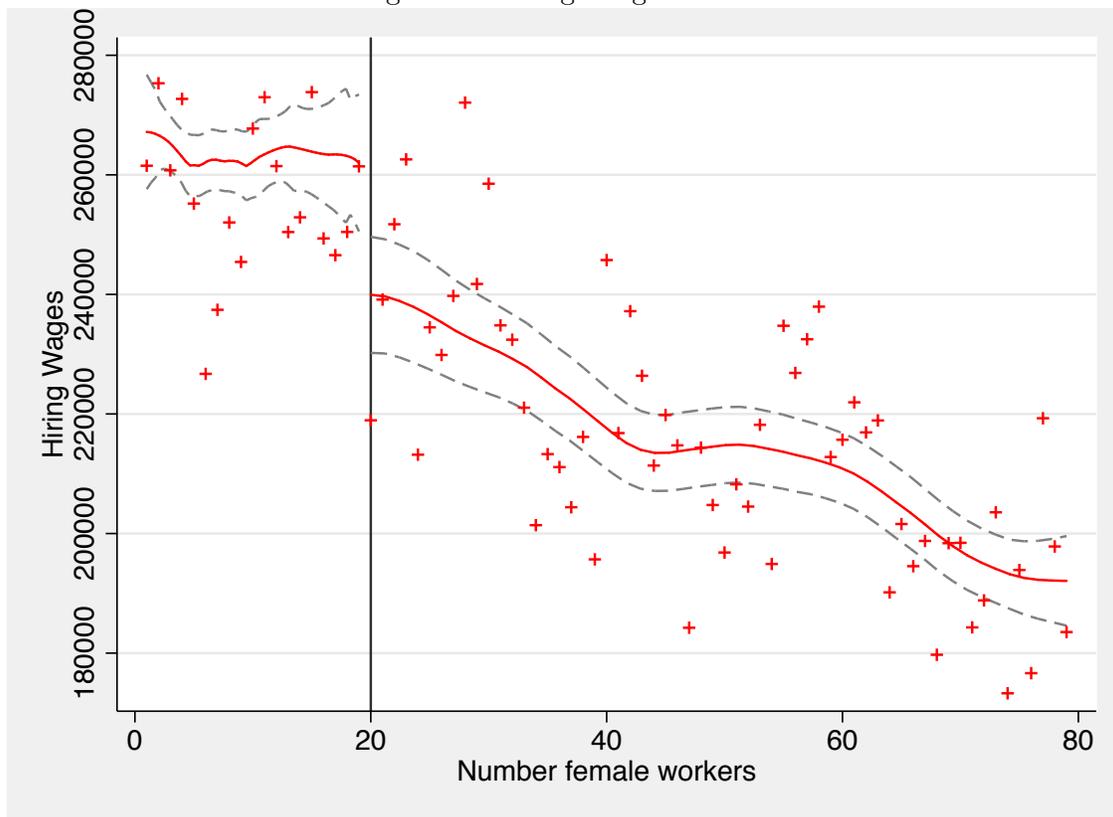
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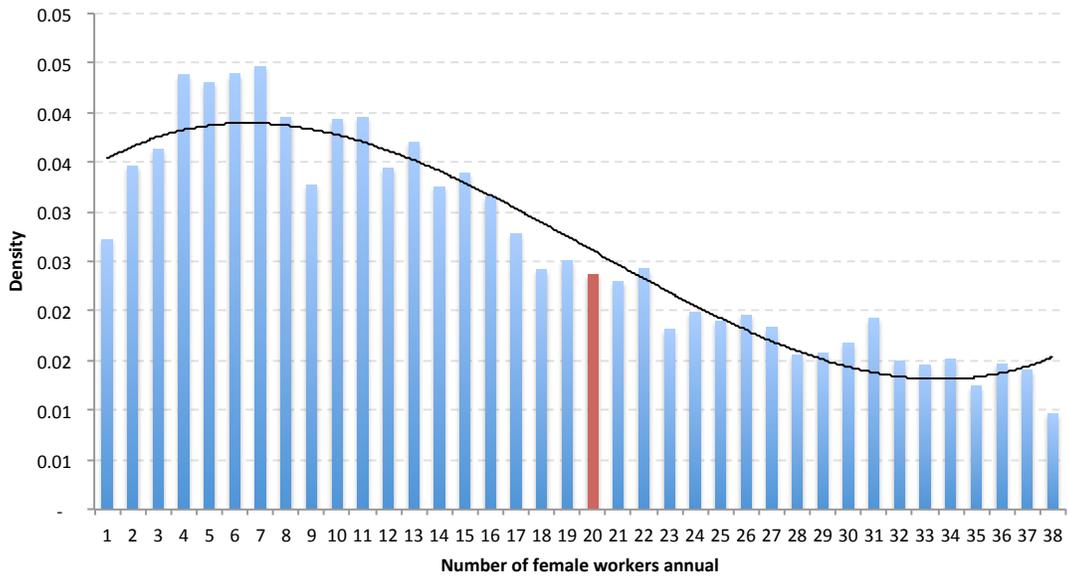
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Figure 1: Average wage females

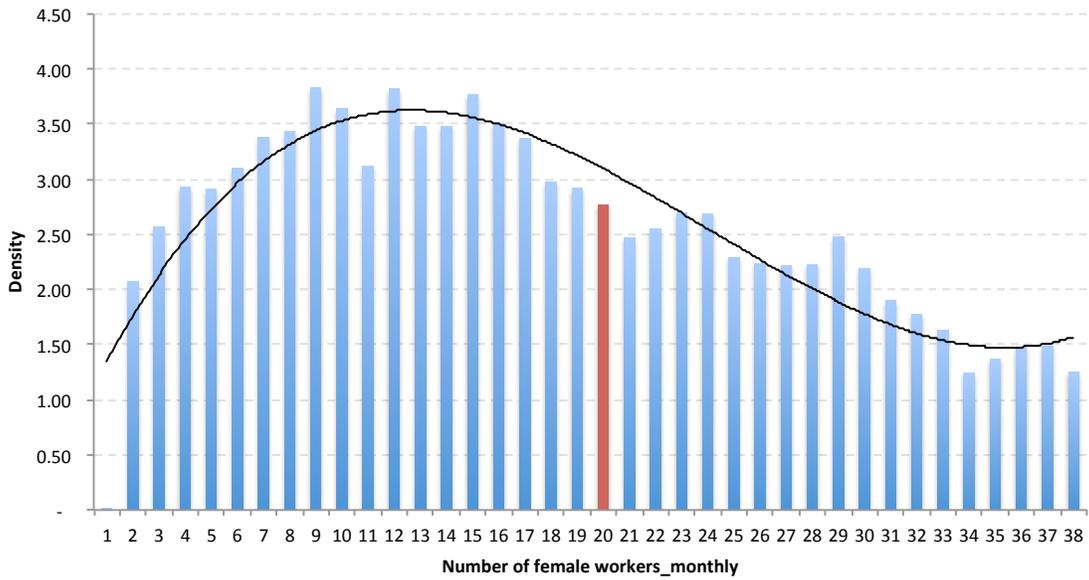


Note: The figure presents the average of the starting wage for females by the number of women working at the firm where they were hired.

Figure 2: Density of Firms by Number of Female Workers



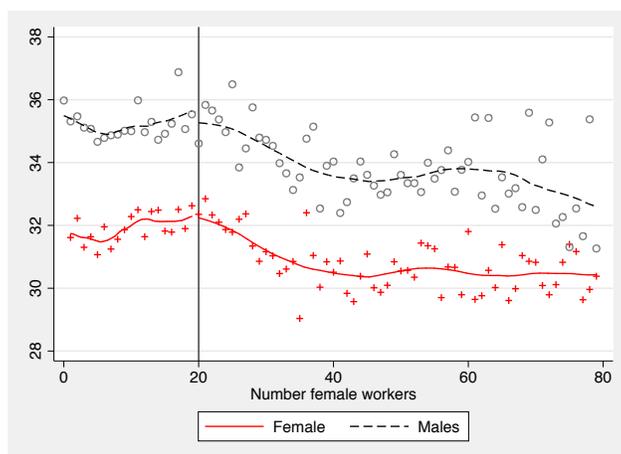
(a) Annually



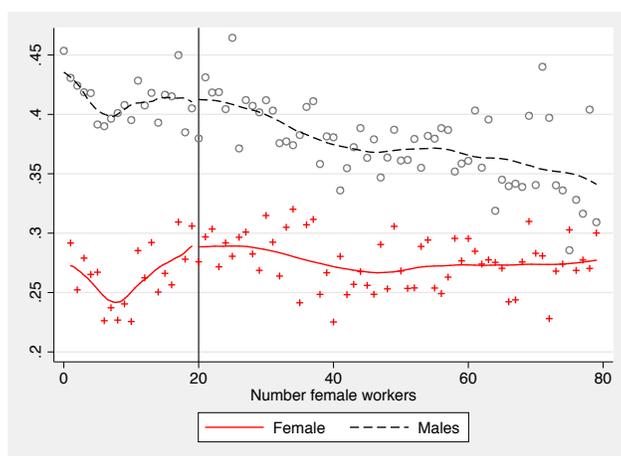
(b) Monthly

Note: The figure presents the density of firms (new and large) by the number of female workers using both monthly and annual frequency data.

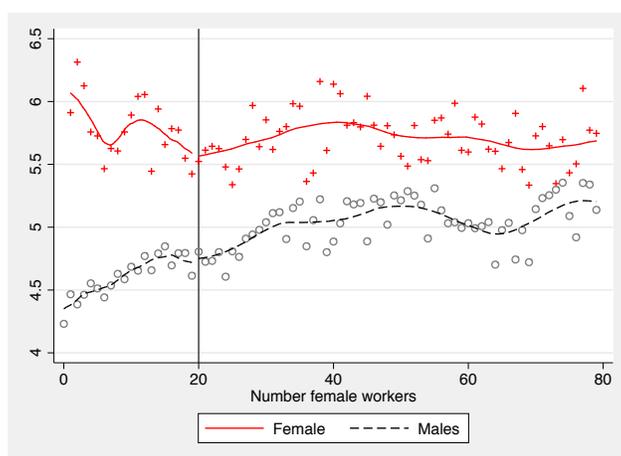
Figure 3: Graphical Discontinuity Test: Observable Individual Characteristics by Gender



(a) Age



(b) Civil Status

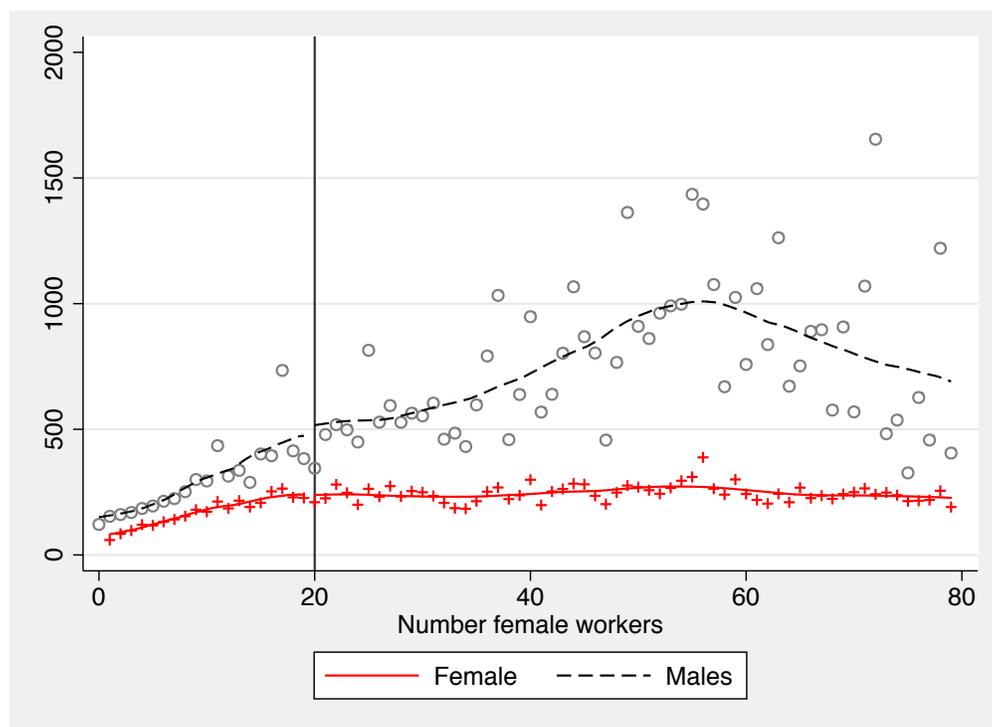


(c) Highest Grade Attended

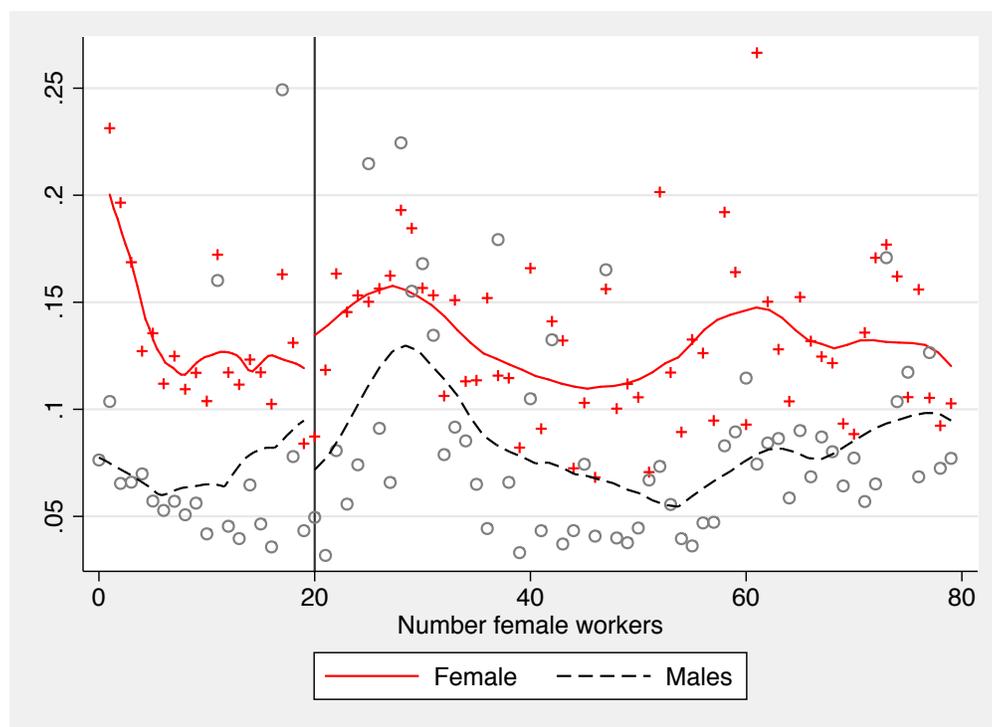
Note: The figure presents the results of running polynomial regressions on different characteristics of both the individuals near the cutoff point.



Figure 4: Graphical Discontinuity Test: Observable Characteristics of the Job by Gender



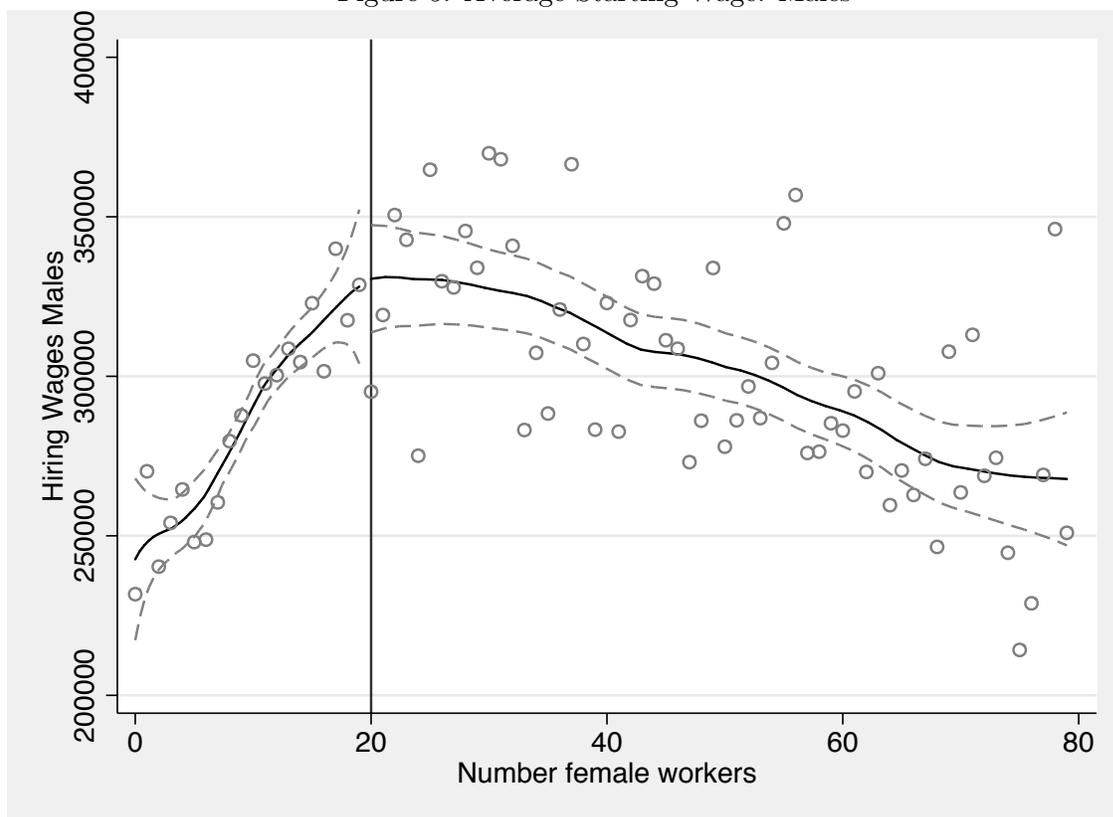
(a) Total Number of Workers



(b) Fixed Term Contract

Note: The figure presents the results of running polynomial regressions on different characteristics of associated with the job near the cutoff point.

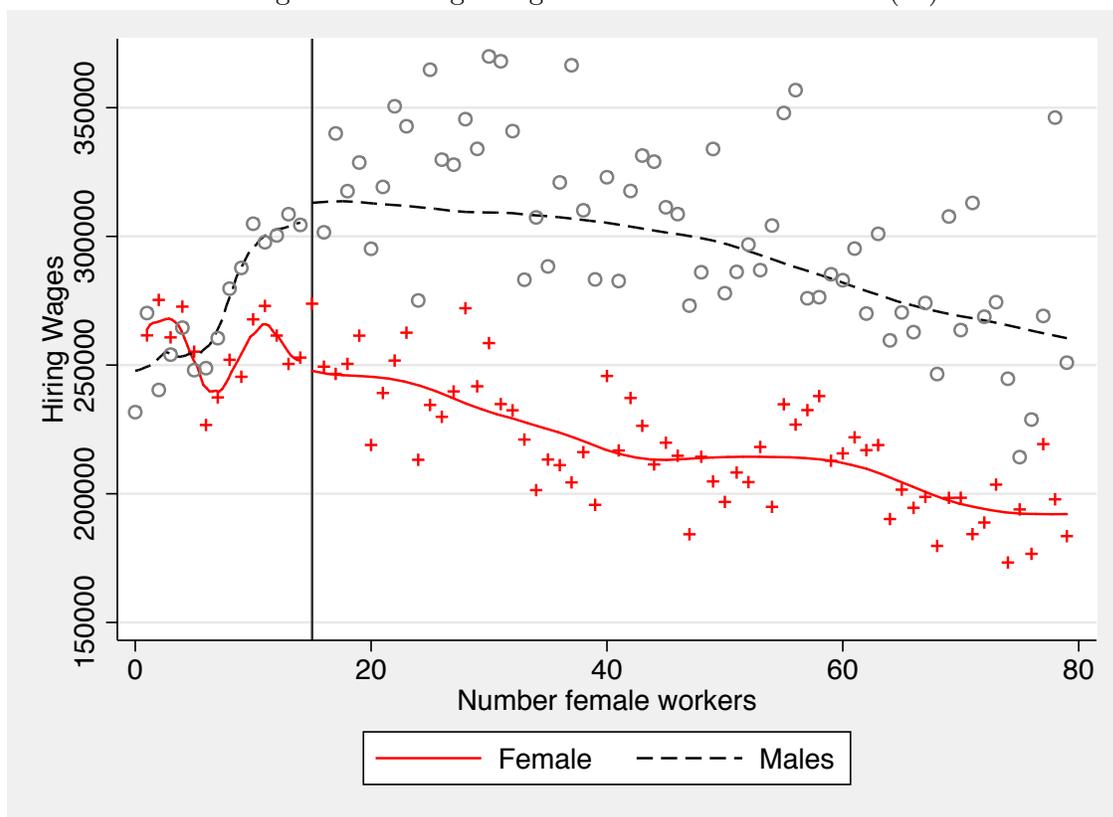
Figure 5: Average Starting Wage: Males



Note:

The figure presents the average of the starting wage for males by the number of women working at the firm where they were hired.

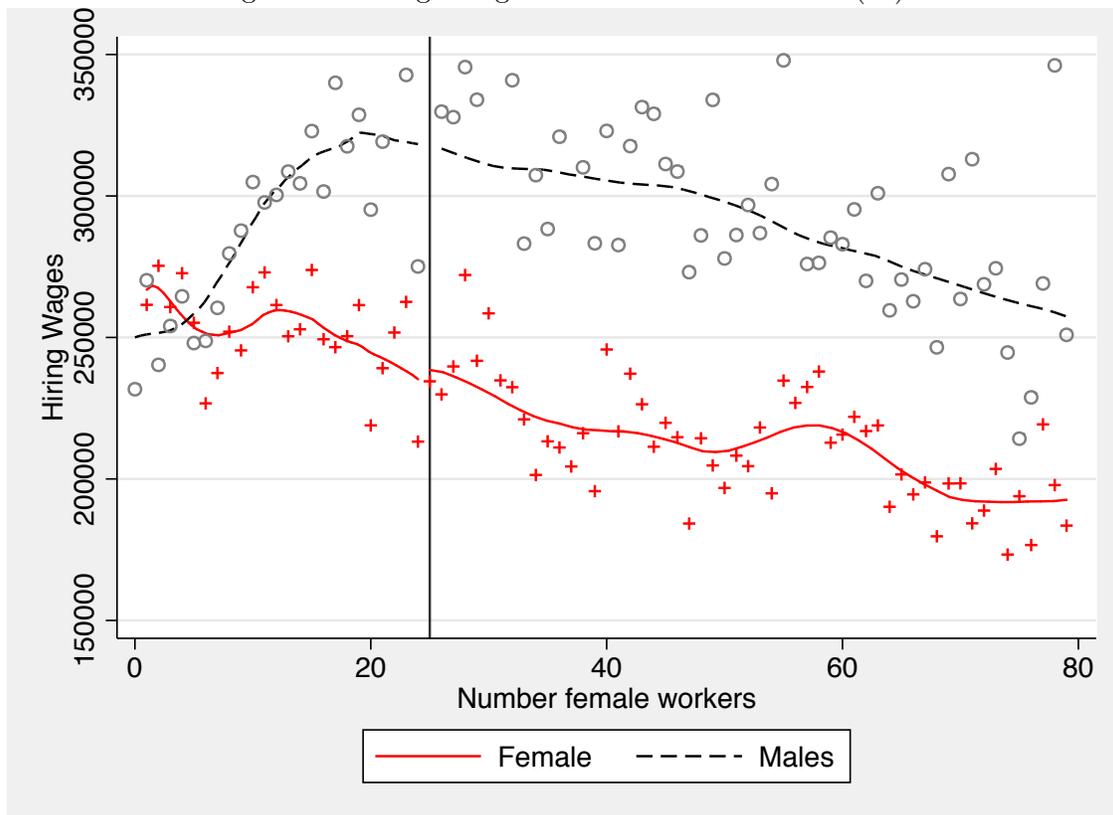
Figure 6: Average Wage Females: Different cutoff (15)



Note:

The figure presents the average of the starting wage for females by the number of women working at the firm where they were hired.

Figure 7: Average Wage Females: Different cutoff (25)



Note: The figure presents the average of the starting wage for females by the number of women working at the firm where they were hired.

Table 1: Descriptive Statistics: Firms by Size and Time of Creation (2005-2013)

	<b>All firms</b>	<b>Large</b>	<b>New</b>	<b>New and large</b>
N_firms	837,899	7,190	525,181	1,912
Crossing	22,033	5,397	7,419	1,224
	2.6%	75.1%	1.4%	64%
N_times crossing	2.82	3.00	2.20	2.41
Observations (month-year)	30,451,078	704,903	13,392,272	109,434

Note: Firms are classified as large if they employ 200 or more workers in a calendar year. Crossing refers to the number of firms that cross the threshold of 20 female workers at least once. N\_times crossing refers to the average number of times firms cross the threshold.

Table 2: Descriptive Statistics: Characteristics of Firms where Female Workers were Hired for the First Time and Starting Wage

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
N_workers	2,059.023	3,248.03	200	20,620
N_female workers	927.6	1,733.77	1	12,101
N_male workers	653.96	1,245.55	0	8,572
Starting wage	174,975	152,566.9	21,063.31	1,253,090
Average wage females firm	212,256.8	163,370.9	0	2,015,287
Average wage males firm	247,426.1	187,017.5	0	2,030,768
Above	0.96	0.19	0	1
Obs (hires)	1'397,823			
N firms	1,912			

Note: "N\_workers" is the average of the number of workers employed in the firm hiring new female workers over the period 2005-2013, "N\_female workers" is the average number of female workers employed in the firm where the individual was hired; the analogous is true for "N\_male workers", "Starting wage" for female and male workers is the average of the real starting wage in Chilean pesos of 2009 for the females and males in the sample, "Average wage females/males firm" corresponds to the average wage of female or male workers working at the firm where the female was hired, "above" is a dummy variable for the firms with 20 or more female workers: the number of observations corresponds to individual hires and "N firms" is the number of firms considered.

Table 3: Adapted McCrary Test for Discrete Running Variable

Window N_females	10	15
Poly. degree 2	-0.08	-0.03
Poly. degree 2 covar	0.04	-0.03
Poly. degree 5	-0.15	0.10
Poly. degree 5 covar	-0.27	0.11

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Notes: The table presents the results of the estimation for the size of discontinuity around the cutoff in the density function of the running variable. “Poly. degree 2” and “Poly. degree 5” refer to the results corresponding to the use of polynomials of degree 2 and 5, respectively. In both cases, we present the results with and without additional controls for the average number of workers and the average wage for female and male workers; “covar” refers to the estimations with additional covariates. “Window Nfemales” refers to the subsample of firms used in the estimation we use a window of 10 and 15 female workers around the threshold of 20, we used clustered-consistent standard errors (clustering on individual values of the number of female workers centered around zero,  $\tilde{F}_{ij}$ ).

Table 4: Main Results: Female Starting Wages at New and Large Firms

Polynomial order		10-30 female workers		5-35 female workers	
2	Baseline	-28,781.9	***	-29,042	**
2	Covariates	-26,310.4	***	-24,433	*
3	Baseline	-26,121.9	*	-16,266	
3	Covariates	-23,694.1		-13,174	
4	Baseline	-33,657.3		-11,051	
4	Covariates	-52,772.0	*	-3,837	

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Notes: The table presents the results of the estimation associated with the regression presented in Equation 4. We present the results associated polynomials of degree 2, 3 and 4, which are the regressions that best fitted the data. The first column presents results in the subsample of females hired for the first time in firms with 10-30 female workers, while the second column includes a wider range of 15 female workers around the discontinuity point. In all cases, we present the results for the baseline case (with no covariates) and for the case that controls for covariates (age, age squared, type of contract, schooling, year and region of residence). We used clustered-consistent standard errors (clustering at the firm level).

Table 5: Main Results: Female Starting Wages New Firms with More than 20 Workers

Polynomial order		10-30 female workers		5-35 female workers
2	Baseline	-940.67		1899.8
2	Covariates	-1232.15		-1711.7
3	Baseline	-5875.2	*	-1333.1
3	Covariates	-6831.06	*	-3685.6
4	Baseline	-7768.11		-3740.99
4	Covariates	-8858.21		-1220.88

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Notes: The table presents the results of the estimation associated with the regression presented in Equation 4. We present the results associated polynomials of degree 2, 3, and 4, which are the regressions that best fitted the data. The first column presents results in the subsample of females hired for the first time in firms with 10-30 female workers, while the second column includes a wider range of 15 female workers around the discontinuity point. In all cases, we present the results for the baseline case (with no covariates) and for the case that controls for covariates (age, age squared, type of contract, schooling, year and region of residence). We used clustered-consistent standard errors (clustering at the firm level).

Table 6: Main Results: Female Starting Wages New Firms with More than 50 Workers

Polynomial order		10-30 female workers		5-35 female workers
2	Baseline	-5355.65		1064.98
2	Baseline	-691.96		-1535.7
3	Baseline	-13633.34	**	-6236.7
3	Baseline	-8557.67		-1079.3
4	Baseline	-9428.04		-6436.73
4	Baseline	-9261.08		-1845.45

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Notes: Table presents the results of the estimation associated with the regression presented in Equation 4. We present the results associated polynomials of degree 2, 3, and 4, which are the regressions that best fitted the data. The first column presents results in the subsample of females hired for the first time in firms with ten to thirty female workers, while the second column includes a wider range of 15 female workers around the discontinuity point. In all cases, we present the results for the baseline case (with no covariates) and for the case that controls for covariates (age, age squared, type of contract, schooling, year and region of residence). We used clustered-consistent standard errors (clustering at the firm level).

Table 7: Main Results: Female Starting Wages New Firms with More than 100 Workers

Polynomial order		10-30 female workers		5-35 female workers	
2	Baseline	-23441.56	***	-18387.96	***
2	Baseline	-16223.23	**	-15296.6	**
3	Baseline	-26863.64	***	-12240.2	
3	Baseline	-19012.6	*	-3207.9	
4	Baseline	-25323.78	*	-12240.16	
4	Baseline	-16361.28		-8699.83	

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Notes: Table presents the results of the estimation associated with the regression presented in Equation 4. We present the results associated polynomials of degree 2, 3, and 4, which are the regressions that best fitted the data. The first column presents results in the subsample of females hired for the first time in firms with ten to thirty female workers, while the second column includes a wider range of 15 female workers around the discontinuity point. In all cases, we present the results for the baseline case (with no covariates) and for the case that controls for covariates (age, age squared, type of contract, schooling, year and region of residence). We used clustered-consistent standard errors (clustering at the firm level).

Table 8: Main Results: Female Starting Wages New Firms with More than 250 Workers

Polynomial order		10-30 female workers		5-35 female workers	
2	Baseline	-49435.79	***	-38430.71	**
2	Baseline	-43026.15	***	-46124.9	***
3	Baseline	-45938.86	**	-44343.1	**
3	Baseline	-51608.77	**	-34682.9	
4	Baseline	-5429.66		-44343.11	**
4	Baseline	-15457.68		-22788.43	

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Notes: Table presents the results of the estimation associated with the regression presented in Equation 4. We present the results associated polynomials of degree 2, 3 and 4, which are the regressions that best fitted the data. The first column presents results in the subsample of females hired for the first time in firms with ten to thirty female workers, while the second column includes a wider range of 15 female workers around the discontinuity point. In all cases, we present the results for the baseline case (with no covariates) and for the case that controls for covariates (age, age squared, type of contract, schooling, year and region of residence). We used clustered-consistent standard errors (clustering at the firm level).

Table 9: RDD Results on Female Wages-Optimal Bandwidth

	<b>Wald estimate</b>	<b>Bandwidth</b>	<b>SE</b>	<b>Obs.</b>
Baseline	-26,780	3.3	29,832.0	909,204
Baseline, N	-31,870.9	3.3	29,637.7	909,204
Baseline, N, Wm	-36,924.5 *	3.3	27,539	909,204
Baseline, N, Wm, Wf	-40,410.2*	3.3	27,292	909,204
Baseline, R, Wm, Wf	-40,643.7*	3.3	27,288	909,204

Notes: The variables used as covariates are: age, age squared, education, geographic location and year of starting. N is the total number of workers, Wm the average wage of males in the firm, Wf the average wage of females in the firm and R the ratio male to female workers. Optimal bandwidth is computed using Imbens and Kalyanaraman (2012). \*\*\*0.01, \*\*0.05, \*0.1.

# TOWARDS A STRONGER AND MORE INCLUSIVE MEXICO

AN ASSESSMENT OF  
RECENT POLICY REFORMS

Better Policies Series

December 2017

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## FOREWORD

Under President Enrique Peña Nieto's leadership, Mexico has put together the most ambitious reform package of any OECD country in recent times, forged the political consensus necessary to approve it through the unprecedented *Pacto por México*, promoted these and other reforms in Congress and has started implementing them. The battery of reforms has addressed challenges in policy areas that had been waiting for deep changes for decades, including education, labour, tax, health, telecommunication, and energy and justice, among many others.

It is still early to fully assess the impact of these changes, but some are already starting to bear fruit. The education reform has led to the first evaluations of teachers and a new education model based on global competencies. Labour, tax and social security reforms have helped reduce informality, with more than 3 million formal jobs created since 2012. Thanks to reforms to the health care sector, insurers are co-operating more and households' out-of-pocket spending has fallen. Public awareness campaigns and the introduction of a sugar tax have led to a slowing in the growth of obesity. Reforms to the telecommunication sector have boosted competition. The number of mobile broadband subscriptions more than tripled between 2012 and 2016, while prices declined by up to 75%. The energy reform opened Mexico's energy sector to private investment and competition, securing private investments of almost USD 80 billion. Changes to constitutional rights, the criminal justice system and everyday justice are helping to better meet the needs of citizens and firms.

The OECD has accompanied and supported the Mexican government in the design, development and implementation of many of these reforms. Since 2013, more than 40 publications on Mexico have been launched, analysing the country's challenges and proposing policies to address them. In many cases, these analyses were complemented by hands-on support to implement legislative and institutional changes and make reform happen. This was not only to the benefit of Mexico, but also to the OECD. Through this constant interaction the OECD learned a great deal and improved its capacity to support countries in their reform efforts.

Mexico still faces important challenges. At close to 17%, Mexico's poverty rate is almost twice the OECD average and regional inequalities remain substantial. Productivity growth is low in many sectors and around 30 million people continue to work in informal jobs without access to stable incomes, training opportunities, financial services, health care or pension coverage. And while the share of low-performing students has fallen, Mexico's 15-year-old students still score below the OECD average measured by the OECD's Programme for International Student Assessment. Enforcement of the rule of law remains weak, especially at state and municipal levels, contributing to high levels of crime and insecurity. Mexico has the highest homicide rate in the OECD and only 46% of people feel safe walking alone at night, well below the OECD average of 68%. Corruption is still an important issue, with more than 60% of people believing that government corruption is widespread.

This is why it is crucial for Mexico to continue its reform agenda. It is imperative to strengthen some of the recent reforms, and to keep updating and promoting them to ensure their effective implementation. The OECD stands ready to further accompany Mexico on this path. Together, let us continue to design, promote and implement better policies for better lives in Mexico and worldwide.



Angel Gurría  
OECD Secretary-General

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## INTRODUCTION



### MEXICO HAS BEEN A REFORM FRONTRUNNER

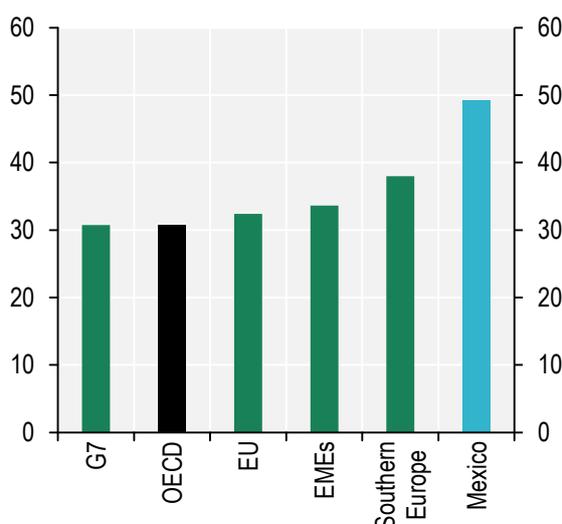
Structural reforms introduced during the administration of President Enrique Peña Nieto have been bold and comprehensive. Over the period 2013-16, Mexico showed one of the highest reform activities among OECD countries (Figure 1.1, panel A). Reform action was triggered by the *Pacto por México*, a historic agreement between the country's three major political parties to put the country back on a path of prosperity after three decades of low growth. Key laws and constitutional amendments were approved. Secondary laws or regulations were passed involving changes in product and labour market regulation and competition policy, as well as measures to improve the efficiency of the tax system. The *Pacto por México* was complemented by reforms aimed at improving the quality of the education and health care systems, enhancing the efficiency of the judiciary system, liberalising the financial sector, strengthening innovation, reducing informality and boosting women's labour market participation.

Mexico's ambitious structural reforms and sound macroeconomic policies have ensured the resilience of the highly open Mexican economy in the face of difficult global conditions. Productivity growth has picked up in sectors that have benefitted from reforms, notably energy, finance, and telecommunication. The OECD estimated that a subset of Mexico's reforms could add 2 percentage points to GDP growth after five years (Figure 1.1, panel B). Yet other sectors lag behind, suffering from overly stringent local regulations, weak legal institutions, corruption and insufficient financial development. Productivity growth is also constrained by longstanding social problems, in particular the poor skills level of the workforce and high rate of informality, which traps workers in precarious jobs.

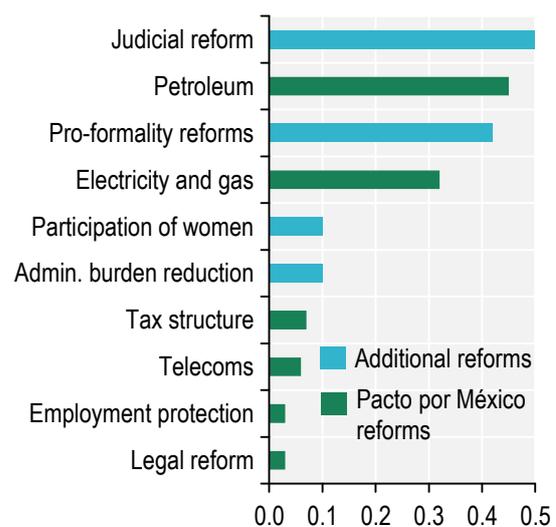
Mexico's reform intensity over the recent past has been impressive. Each of the reforms has been wide-ranging in scope and is intended to address the main challenges in its respective sector. The OECD was strongly committed to Mexico's reform agenda and supported it in many ways.

**Figure 1.1. Mexico's high reform activity is contributing to better economic performance**

A. Share of OECD *Going for Growth* recommendations with significant action taken, 2013-16, in %



B. Expected boost to annual growth on average over the 5 years following reform, in %



Note: Panel A: EU includes OECD member countries that are also part of the EU. EMEs include Brazil, Chile, China, Colombia, Hungary, India, Indonesia, Mexico, Poland, South Africa and Turkey. Southern Europe includes Greece, Italy, Portugal and Spain.

Sources: OECD (2017), *Economic Policy Reforms 2017: Going for Growth*, <http://dx.doi.org/10.1787/growth-2017-en>; OECD (2015), *OECD Economic Surveys: Mexico 2015*, [http://dx.doi.org/10.1787/eco\\_surveys-mex-2015-en](http://dx.doi.org/10.1787/eco_surveys-mex-2015-en).



## INTRODUCTION

### PROGRESS NEEDS TO BE MORE INCLUSIVE TO IMPROVE THE WELL-BEING OF ALL

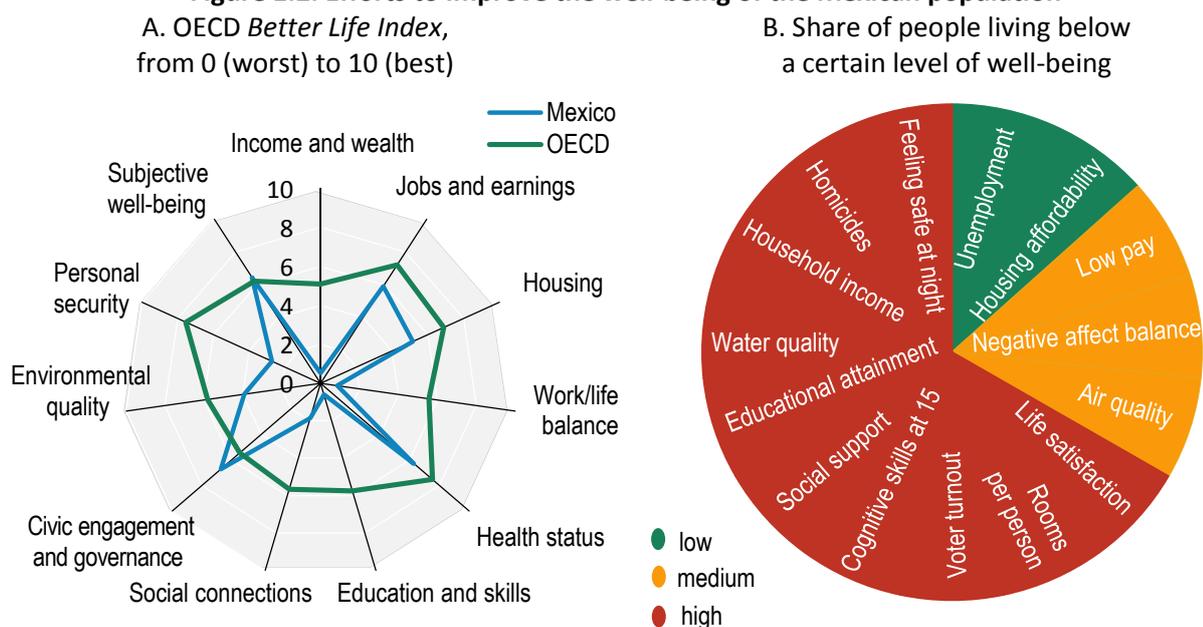
Reforms launched over the past five years have laid the foundation for higher prosperity and well-being. Fully implementing these legislative and institutional changes is now crucial. Equipping Mexicans with relevant skills and improving access to good-quality jobs will allow them to fully benefit from productivity-enhancing reforms.

Helped by the reforms, well-being has improved over the last five years. The share of informal workers fell by 3 percentage points, giving more workers, particularly the most vulnerable, access to stable incomes, training opportunities, financial services, health care and pension coverage. Health care and education coverage have improved, as have education outcomes, including for low-performing students.

But inequalities persist, driven by the divergence of a highly productive modern economy in the North and Centre and a lower-productivity traditional economy with small-scale informal firms in the South. Income remains highly concentrated: the richest 20% earn ten times more than the poorest 20%, compared to 5.4 times in the OECD (Figure 1.2, panel A). Despite a fall in extreme poverty, many families remain poor, and the potential for children to do better than their parents lags behind other OECD countries. Mexico has a high share of people suffering from deprivation in many aspects of well-being including skills, social support and security (Figure 1.2, panel B). Regional disparities remain substantial. Living in one of the worst-faring states can mean being four times as likely to be at risk of poverty, seven times as likely to abandon school and seven times as likely to work longer hours for lower pay than people living in the best-faring states.

The structural reforms launched under President Peña Nieto were an important step towards a stronger, greener and more inclusive Mexico. Yet a lot of work still lies ahead. Most importantly, legislative and institutional changes now need to be fully implemented, including at the local level. The limited administrative capacity of many state and local governments calls for strong support and monitoring at the national level. Effective reform implementation also requires continued efforts to address institutional bottlenecks, including with respect to the rule of law and corruption. Moreover, for people to fully contribute to higher economic growth, equipping them with good and relevant skills as well as good health is crucial.

**Figure 1.2. Efforts to improve the well-being of the Mexican population**



Sources: OECD (2017), *OECD Better Life Index 2017*, [www.oecdbetterlifeindex.org](http://www.oecdbetterlifeindex.org); OECD (2017), *How's Life? 2017: Measuring Well-being*, [http://dx.doi.org/10.1787/how\\_life-2017-en](http://dx.doi.org/10.1787/how_life-2017-en).

## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE



### REFORMS HAVE HELPED REDUCE POVERTY, THOUGH IT REMAINS HIGH

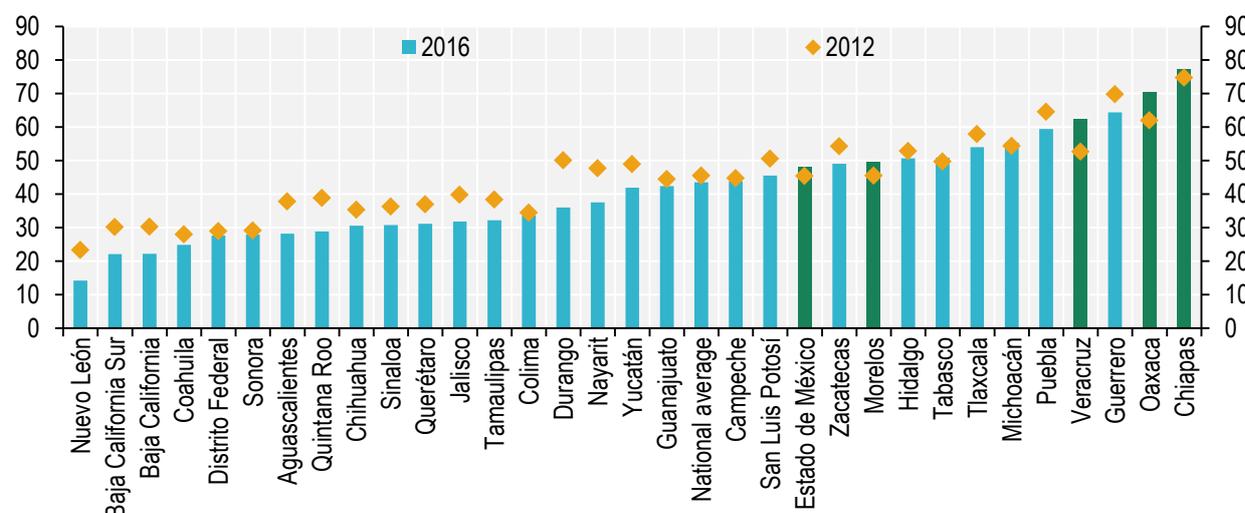
Mexico's 2013-18 National Development Plan significantly increased social spending and improved the targeting of government transfers. The conditional cash transfer programme *Prospera* is now better linked to educational services, vocational training, formal employment opportunities and formal banking, promoting the self-sufficiency of beneficiaries. The minimum age of the social pension was lowered to include those aged 65 and above. While this guarantees a minimum income level, the benefit level is still below the extreme poverty line.

Helped by these reforms and Mexico's National Inclusion Strategy, the share of people living on less than 50% of the median income fell by 2 percentage points during 2012-14. The poverty rate is still almost twice the OECD average, however, with children and the elderly most affected. Poverty rates differ markedly across states. The share of people living on less than 50% of median income ranges from 6.8% in Nuevo León to 50% in Chiapas. A broader measure of poverty that considers non-income dimensions of well-being confirms these regional differences (Figure 2.1). While multidimensional poverty decreased in 25 out of 31 Mexican states and Mexico City between 2012 and 2016, it increased further in states that already had the highest prevalence of poverty. To address regional disparities, the Federal Law on Special Economic Zones was passed in 2016 to foster economic development in Mexico's poorest states. Mexico is one of the few OECD countries to have experienced a decline in income inequality during the 1990s until the mid-2000s, although the level of inequality has since stagnated and remains one of the highest in the OECD.

To further reduce poverty and inequality, social programmes and financing must be strengthened, consolidating recent achievements. Policy strategies must be comprehensive and targeted at specific states. A common database on a single technological platform may help improve co-ordination between levels of government and enhance the targeting of social programmes. In addition, efforts must ensure the equal participation of disadvantaged groups, including indigenous people.

Working with SEDESOL, the OECD is supporting Mexico in assessing progress over the past 25 years along the various dimensions of poverty and identifying areas where further progress is needed.

**Figure 2.1. Poverty has fallen in most Mexican states**  
Poverty rate in %, measured along eight dimensions of well-being



Note: States with a fall (rise) in poverty are marked in blue (green). The eight well-being dimensions are household income, education, housing quality, social cohesion, access to health services, security, housing services and food. For details, see <http://www.coneval.org.mx/SalaPrensa/Comunicadosprensa/Documents/Comunicado-09-medicion-pobreza-2016.pdf>.

Sources: National Council for the Evaluation of Social Development Policy (CONEVAL) based on MCS-ENIGH 2010-14 and Modelo Estadístico 2016 para la continuidad del MCS-ENIGH (MEC 2016).



## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE

### MEXICO HAS MANAGED TO REDUCE THE SHARE OF LOW PERFORMERS IN ITS EDUCATION SYSTEM

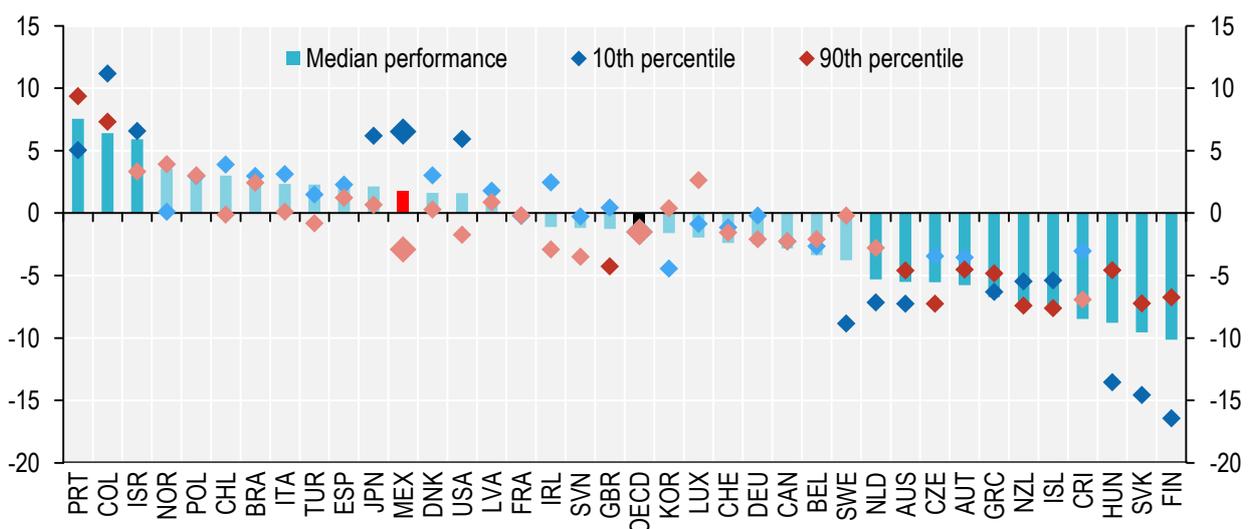
Mexico's education reform is well-aligned with previous OECD policy recommendations. They include putting students and schools at the centre of the education system, implementing a new curriculum and raising the quality of the teaching profession.

Mexico has made significant progress in improving the coverage and quality of its education system. Today, nearly all children between the ages of 4 and 14 are in school. President Peña Nieto's ground-breaking constitutional reform improved the education system by advancing an agenda with a common basic goal: putting students and schools at the centre of the system to improve learning outcomes. Mexico has been working towards this goal by improving school environments, investing in more and better infrastructure, refining evaluation and assessment practices, fostering equity and inclusion, and raising the quality of the teaching profession. Mexico's new education model was introduced in 2017 with the aim of ensuring that children receive a quality education that prepares them for 21<sup>st</sup>-century challenges.

While some 48% of students in Mexico are low performers in science (meaning they did not achieve Level 2 in the OECD's Programme for International Student Assessment [PISA]), this group showed an average improvement of 7 score points every three years between 2006 and 2015 (Figure 2.2). It is noteworthy that Mexico was able to make this progress while increasing access to education: the total population of 15-year-olds enrolled in grade 7 or above since 2003 has increased by 300 000, of which 60 000 have been added just since 2012.

Mexico should continue improving access to education, reducing its share of low-performing students and working to raise the number of high-performing students, as this also remains behind the OECD average. Mexico's 15-year-old students still consistently score below the OECD average across all domains measured by PISA. Large performance and completion gaps persist, especially for students with indigenous and low socio-economic backgrounds.

**Figure 2.2. Mexico has seen improvements among its lowest performers**  
Average three-year trends in PISA scores in science



Note: Statistically significant differences are marked in a darker tone. The average three-year trend is the average rate of change per three-year period between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model.

Source: OECD, PISA 2015 Database, [www.oecd.org/pisa/data/](http://www.oecd.org/pisa/data/).

## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE



### EDUCATION AND TRAINING HAVE BECOME MORE RELEVANT TO THE WORLD OF WORK

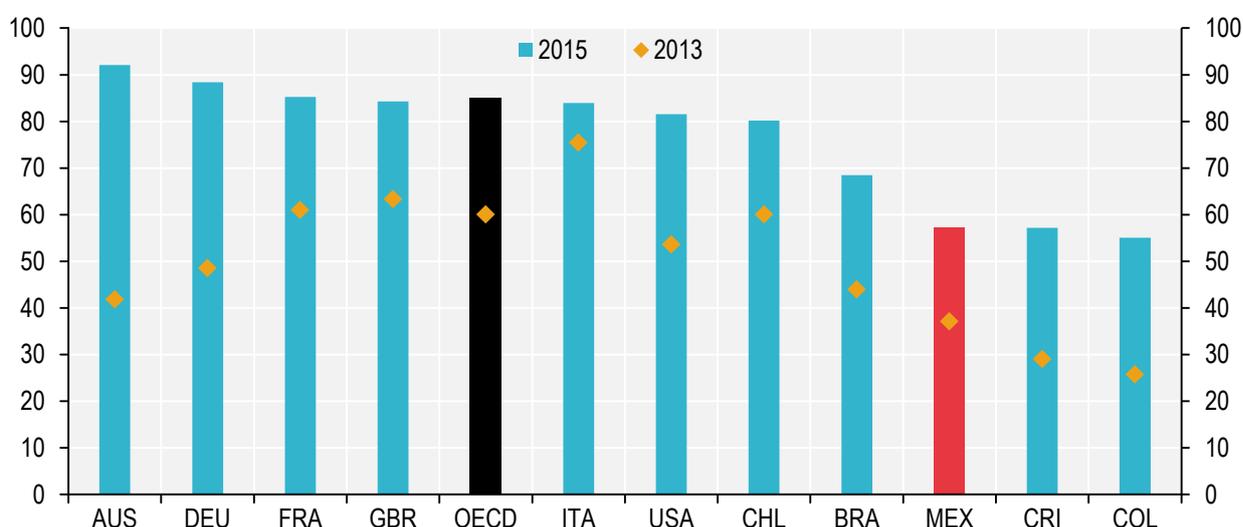
While Mexico has made progress at the educational level, young people also need the right mix of skills to keep abreast of changing labour market needs and succeed in adult life. To raise the skills of its youth population, Mexico made upper secondary education compulsory in 2012 with the goal of attaining universal coverage by 2021. Enrolment rates in upper secondary and tertiary education have seen impressive increases, but this progress has not been equitable. The share of Mexican adults with upper secondary and tertiary education remains below the OECD average (Figure 2.3). Moreover, upper-secondary drop-out rates are very high. This leaves the country with a comparatively low-skilled workforce.

Raising educational attainment alone will not be enough. Skills must also be relevant to the needs of the labour market. To improve the labour market relevance of its education and training system, Mexico has expanded private sector involvement, increased the number of apprenticeships, and raised the supply of training and vocational programmes. The labour reform enhanced the certification of skills and led to the creation of commissions to promote training. Mexico has also been encouraging young people to pursue careers and research in science, technology, engineering, and mathematics (STEM) fields, in line with labour market developments. In 2016, one quarter of adults with tertiary education had a degree in one of these fields, on par with the OECD average.

Closing the gap between the supply and demand of skills requires co-ordinated efforts among different ministries and various stakeholders. In particular, strong commitment by businesses to invest in their workers is needed. The National Productivity Committee (NPC) was created to help facilitate this co-ordination by aligning skills policies with industry needs. The NPC's mandate includes co-operation with subnational authorities. In addition, tackling skills imbalances requires up-to-date and high-quality information on skills needs to guide training provision and career choices.

The OECD Skills Strategy project provided an extensive diagnosis and 11 specific recommendations as inputs to Mexico's long-term skills development strategy.

**Figure 2.3. Participation in upper secondary education is rising, but is still below the OECD average**  
Enrolment rates of 15-19 year-olds, 2015



Source: OECD, *Education at a Glance 2017 Database*, <http://stats.oecd.org>.



## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE

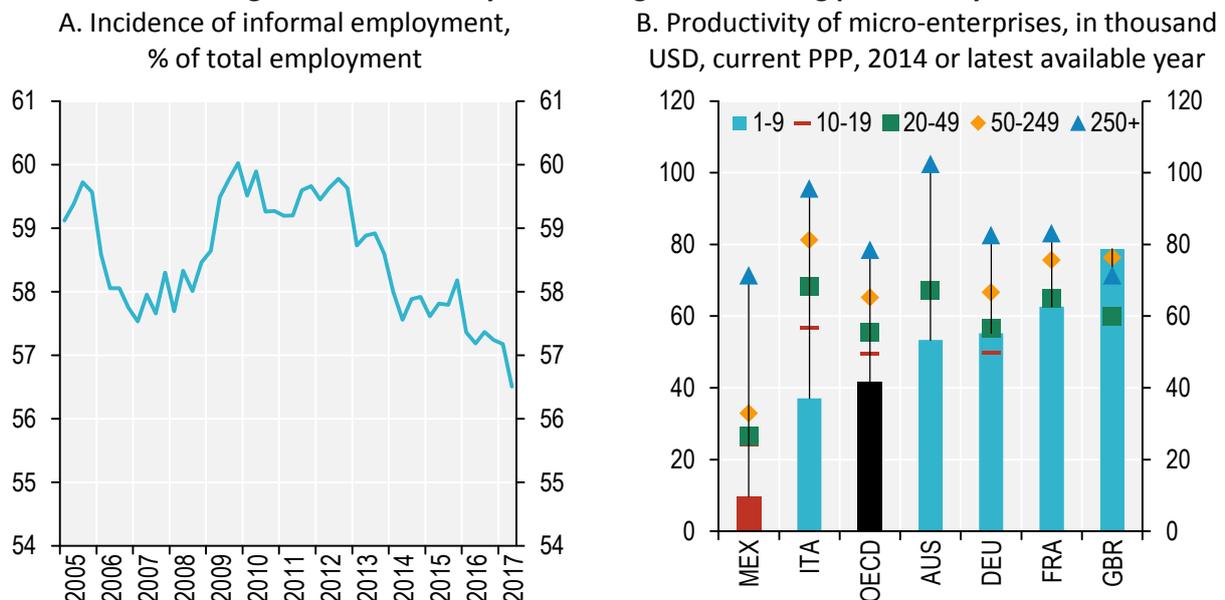
The OECD supported Mexico in its endeavour to address informality through various editions of its *Economic Surveys on Mexico*, published every two years. The 2011 edition included a special chapter on informality. Moreover, the topic was also discussed in the 2013 *Getting it Right* report.

### INFORMAL EMPLOYMENT IN MEXICO IS DECREASING

While informality remains high, Mexico has made progress over the past five years, reducing the proportion of informal workers from 59.6% in the last quarter of 2012 to 56.5% by the end of the first half of 2017 (Figure 2.4, panel A). Over 3 million formal jobs were created, with almost a quarter of them going to young people. Informality is concentrated in very small informal firms (which employ more than half of Mexico's informal workers) and in the South. It is associated with low productivity, as resources remain trapped in informal activities and are not used in more productive ones (Figure 2.4, panel B). Furthermore, workers in informal firms tend to receive less training and are less likely to accumulate human capital. They also suffer from lower job quality along several dimensions, including pay, labour market security and quality of the working environment.

The decline in informality was helped by a number of reforms. The government stepped up supervision for firms with 50 or fewer employees. It introduced labour, tax and social security reforms, simplifying tax compliance and substantially reducing personal, social security, value added and excise tax obligations for the first decade of firms' operation. These reforms, which include incentives to help new firms expand (including access to government-backed financing and training and a series of electronic tools to simplify tax compliance), have induced 1.5 million informal firms to join the tax system since 2014. There are still many efforts to be taken to help achieve the goals of these reforms, for instance by increasing awareness and information about how to make the best out of the social security regime for incorporation. Going forward, Mexico could also consider extending and further enhancing regulation and supervision to reduce state-level informality.

**Figure 2.4. Informality remains high, constraining productivity**



Note: Panel A: The informality rate is the percentage of employed people not covered by social security or working in unregistered economic units. Panel B: Value added per person employed. MEX data refer to establishments.

Sources: *Encuesta Nacional de Ocupación y Empleo Informalidad Laboral*; *Tasas de informalidad trimestral*; *OECD SDBS Database*, <http://stats.oecd.org>.

## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE



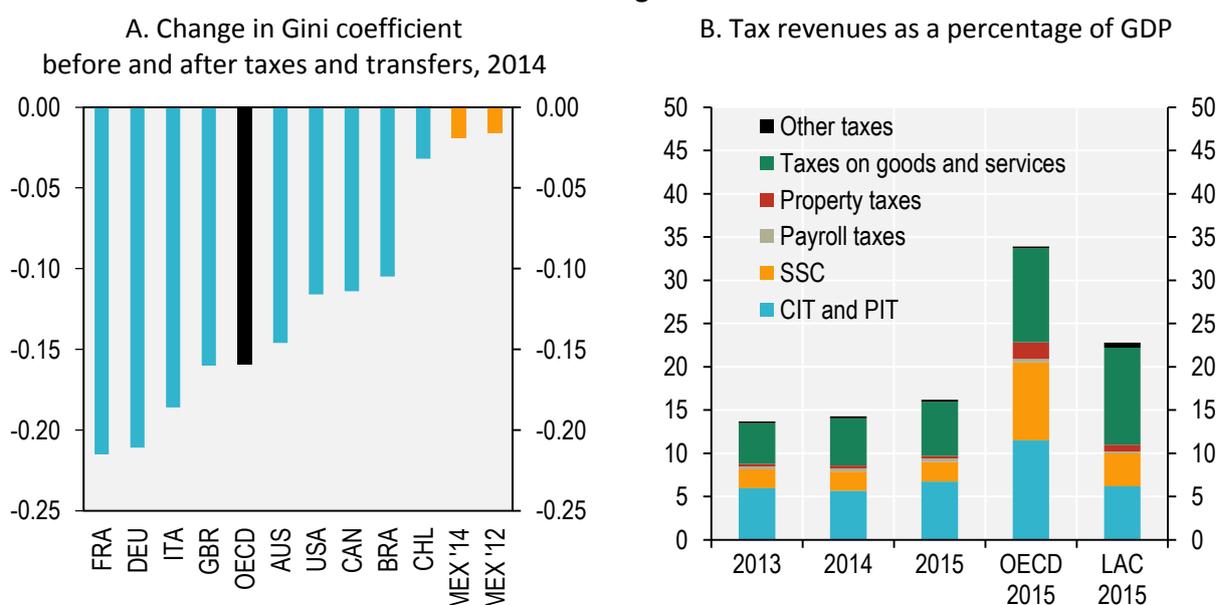
### TAX REFORM HAS CONTRIBUTED TO BETTER EQUALITY

In October 2013, Mexico introduced an ambitious tax reform which took effect the following year. Many of the changes were aligned with OECD tax policy recommendations. The top personal income tax rate was raised to 35%, and limits were imposed on tax deductions. A capital gains and dividend tax of 10% was also introduced. In terms of corporate taxation, limits on depreciation allowances were imposed and an alternative tax regime was eliminated. A number of loopholes and exemptions that allowed for accelerated deduction of investment expenses were removed or reformed. The preferential tax treatment of *maquiladoras* was revised to make it more neutral. Consumption taxation was broadened by abolishing reduced VAT rates in the border regions, and special exemptions for *maquiladoras* were removed. Mexico also introduced a tax on high-caloric foods and sweetened beverages.

The tax reform helped increase the redistributive effect of the tax and transfer system (Figure 2.5, panel A). Before the reform, Mexico's tax and transfer system was least effective among OECD countries in reducing income inequality. Even after the reform, income inequality remains above the OECD average, suggesting that further reforms will be needed. The tax reform also contributed to higher tax revenues. Total tax revenues increased by more than 2.5 percentage points between 2013 and 2015 (Figure 2.5, panel B), with taxes on goods and services (+ about 1.5 percentage points) and corporate and personal income taxes (+ about 0.8 percentage points) recording the largest increases. Nevertheless, tax revenues remain low when compared to OECD countries and other countries from Latin America and the Caribbean.

The OECD provided the Mexican government with various assessments of the strengths and weaknesses of the country's tax system. The OECD also contributed with tax-related technical advice.

**Figure 2.5. The 2013 tax reform has made the tax system slightly more redistributive and contributed to higher tax revenues**



Note: In panel B, SSC denotes social security contributions, CIT corporate income taxes and PIT personal income taxes. The numbers do not include oil royalties, which are classified as non-tax revenues and amounted to 4.6% of GDP in Mexico in 2015.

Sources: OECD et al. (2017), *Revenue Statistics in Latin America and the Caribbean 2017*, [http://dx.doi.org/10.1787/rev\\_lat\\_car-2017-en-fr](http://dx.doi.org/10.1787/rev_lat_car-2017-en-fr); OECD (2017), *Revenue Statistics 2017: Tax revenue trends in the OECD*, <http://www.oecd.org/tax/tax-policy/revenue-statistics-highlights-brochure.pdf>; OECD Income Distribution and Poverty Database, [www.stats.oecd.org](http://www.stats.oecd.org); Mexican Ministry of Finance (SHPC); Commitment to Equity Institute data for Mexico and Brazil, [www.commitmenttoequity.org](http://www.commitmenttoequity.org).



## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE

### MEXICO MUST KEEP WORKING TO REACH GENDER EQUALITY

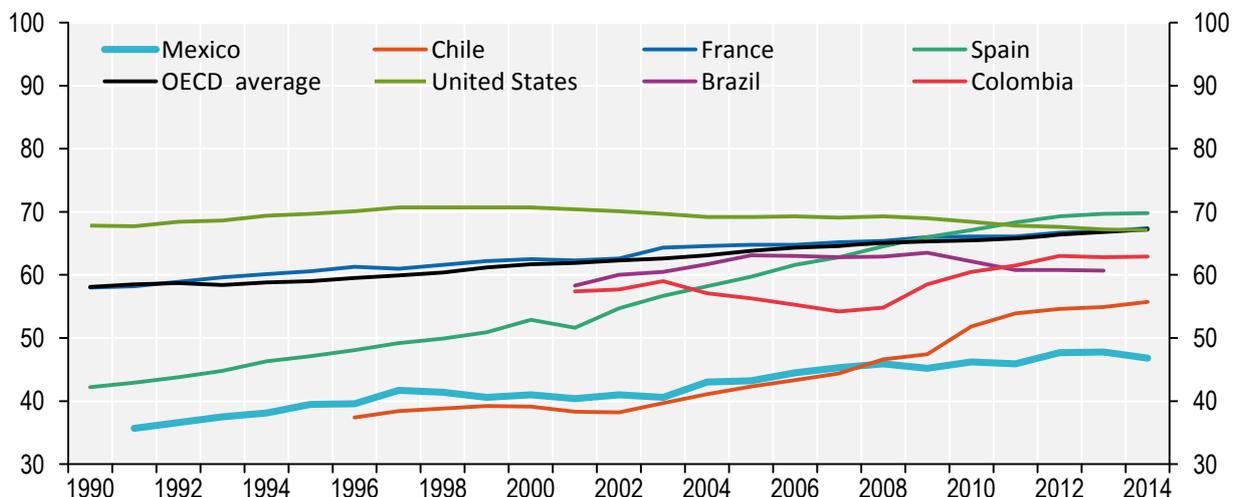
To help Mexico promote gender equality and the empowerment of women in economic and public life, the OECD prepared the 2017 review *Building an Inclusive Mexico: Policies and Good Governance for Gender Equality in collaboration with the National Women's Institute (INMUJERES)*.

In recent years Mexico has enacted good policies to close gender gaps in labour market outcomes. Gender equality budgets are being increased, with major resources dedicated to advancing women's economic autonomy. In the framework of the new educational model, public scholarships are keeping more girls in upper secondary school, and the Ministry of Education has made it a priority to inspire girls and young women to study science, technology, engineering, and mathematics (STEM) fields, as evidenced by the *NiñaSTEM Pueden* initiative. The increase in the quantity and quality of childcare centres, such as the Ministry of Social Development's *Estancias Infantiles*, are giving mothers more childcare options – a key tool for improving women's labour force participation. Programme changes to *Prospera* are helping to better link recipient mothers to the labour market. In 2017, financial sector regulation was changed to enhance women's participation in boards and decision-making positions in companies listed on the Mexican Stock Exchange. Moreover, women's access to financial services was improved by strengthening the National Development Banking programmes, especially for women living in poverty and in vulnerable conditions.

While these are steps in the right direction, Mexico still has a long way to go on the road to gender equality. At 16.5%, the gender gap in earnings for full-time employees was still substantial in 2016. Women make up a majority of all graduates with bachelor degrees (54%), and a very slight minority of doctoral graduates (48%). Although the labour force participation of women keeps rising (Figure 2.6), Mexico continues to have the second-largest gender employment gap in the OECD. Among women who work, more than half hold informal jobs and women perform over 75% of all unpaid housework and childcare. Mothers, in particular, have a difficult time engaging in paid work due to insufficient good-quality and affordable childcare options (even if availability has improved in recent years). Violence against women is also a major problem. In 2016, 34% of women aged over 15 years had experienced physical violence at least once in their lifetime according to Mexico's National Institute of Statistics and Geography, and 41% of women over 15 years had experienced sexual violence at least once in their lifetime.

**Figure 2.6. Mexican women's labour force participation rate is improving, but still lags behind most of the OECD**

Labour force participation rates for women aged 15 to 64



Source: OECD (2017), *Building an Inclusive Mexico: Policies and Good Governance for Gender Equality*, <http://dx.doi.org/10.1787/9789264265493-en>.



### WOMEN'S PARTICIPATION IN PUBLIC BODIES IS RISING

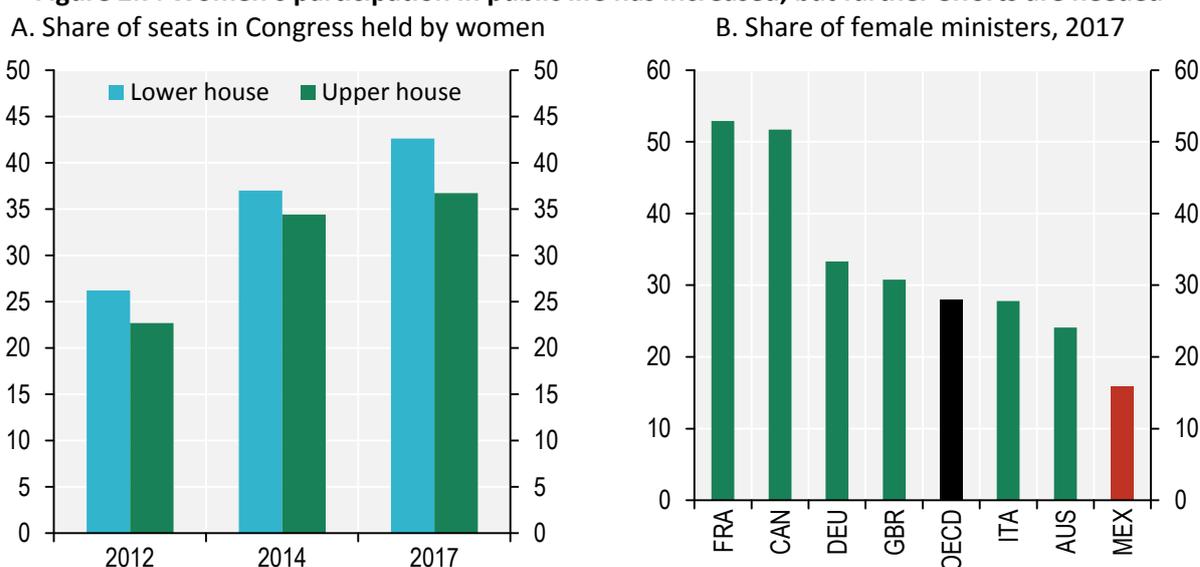
Since 2013, important reforms have been initiated – notably by the Presidency and INMUJERES – to advance gender equality in public institutions. Major steps include the incorporation of a gender perspective in the National Development Plan 2013-18, the 2013-18 National Programme for Equal Opportunities and Non-Discrimination against Women, and a 2014 electoral reform introducing gender parity. Thanks to these reforms, Mexico has made significant progress in increasing women's representation in Congress (Figure 2.7, panel A), placing itself among the top OECD countries in terms of women's representation in the national legislature. Women made up 42.6% of seats in Mexico's Chamber of Deputies in 2017, up from 26.2% in 2012 (Figure 2.7, panel A) and well above the OECD average of 28.8%.

But Mexico still falls short of meeting its constitutional commitment to parity. Only 16 of 56 ordinary commissions in the Chamber of Deputies were presided over by women in 2016. Women still hold far fewer political decision-making positions in the executive branch than their male counterparts. At the federal level, only three of 19 (15.8%) ministerial positions were held by women in 2017, lower than in 2012 (21.1%) and lower than the OECD average (27.9%; Figure 2.7, panel B). While Mexican women are well represented in the Mexican Federal Public Administration (accounting for 51% of public employees in 2016), they fill only one-third of managerial positions. The same applies to the judiciary branch, where women occupied only 2 out of 11 seats in the Supreme Court in 2015.

To tackle the barriers faced by women in public decision-making positions, including political harassment and violence against women, sexual harassment and difficulties in balancing professional and personal life, Mexico created the Mexican Standard on Labour Equality and Non-Discrimination. This certifies public and private workplaces, including with respect to women's representation in decision-making. Mexico needs to continue embedding gender equality considerations in all government actions, including policies, budgets, services and internal working processes.

The OECD supported Mexico's quest for greater gender equality through the 2015 OECD Recommendation on Gender Equality in Public Life and the 2013 OECD Recommendation on Gender Equality in Education, Employment and Entrepreneurship.

**Figure 2.7. Women's participation in public life has increased, but further efforts are needed**



Sources: OECD (2017), *Building an Inclusive Mexico: Policies and Good Governance for Gender Equality*, <http://dx.doi.org/10.1787/9789264265493-en>; Inter-Parliamentary Union (IPU) PARLINE Database; IPU and UN Women, *Women in Politics Map*, 2017.



## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE

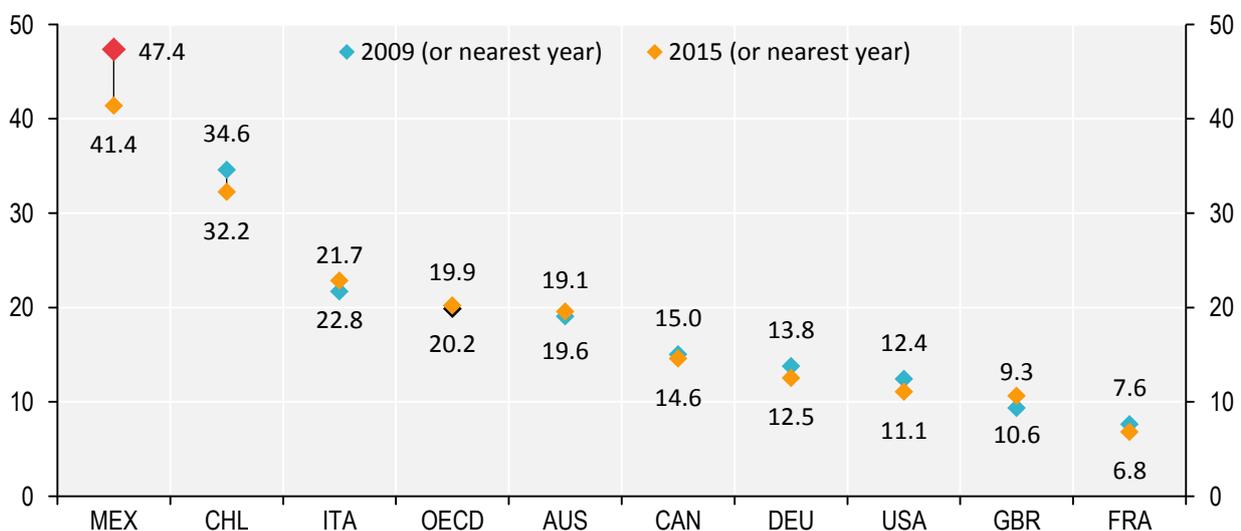
### MEXICO IS ADVANCING TOWARDS A HIGH-PERFORMING HEALTH SYSTEM

The OECD's 2016 *Health System Review of Mexico* identified steps that Mexico can take in the short and medium term to build a more equitable, efficient and sustainable health system.

Mexico has made progress in creating a healthier society and building a more efficient and equitable health system. Public health campaigns have been very successful. The growth in obesity is slowing, and the share of heavy drinkers and smokers is substantially lower than in most other OECD countries. A campaign to vaccinate against influenza reached 82% of Mexicans aged over 65, far exceeding the OECD average of 43%. A fundamental challenge is that Mexican health care is provided through a cluster of disconnected subsystems. Efforts to restructure the public health system around patients' needs are slowly bearing fruit. Health care insurers are co-operating more, developing shared standards and indicators of the quality of care. More service-exchange agreements among public institutions are being signed, allowing patients from one insurer to use the clinics of another. In 2016, the National Agreement towards the Universalisation of Health Care Services was adopted, seeking universal coverage, exchange of services and joint planning of infrastructure among public health care service providers. Most importantly, out-of-pocket spending is falling, meaning that insurance is improving (Figure 2.8).

Much remains to be done, however. Health outcomes in Mexico are, in general, worse than in other OECD countries. The gap in life expectancy between Mexico (75.0 years at birth) and other OECD countries (80.6 years on average) remains wide. The chances of surviving a heart attack or stroke are the lowest in the OECD. Children with leukaemia are also much less likely to survive in Mexico than in other OECD countries. More investment is needed to bring health care spending (per capita and as a percentage of GDP) closer to OECD averages. In 2016, Mexico spent just 5.8% of GDP on health care, compared to the 9.0% OECD average. Despite improvements, access to services remains far from equal, with different levels of service between subsystems and individuals' out-of-pocket spending on health care among the highest in the OECD, signalling a failure of current arrangements to provide effective insurance or deliver high-quality services that people want to use. Further structural reform can help reduce differences across the various subsystems and improve equity. Most urgently, concerted effort to improve the quality of care is needed.

**Figure 2.8. Out-of-pocket health spending has fallen, but is still very high by international comparison**  
Change in out-of-pocket expenditure as a share of total expenditure on health



Source: OECD Health Statistics 2017, OECD National Accounts Database, <http://stats.oecd.org>.

## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE



### A MULTISECTORAL STRATEGY HOLDS PROMISE TO REDUCE OBESITY

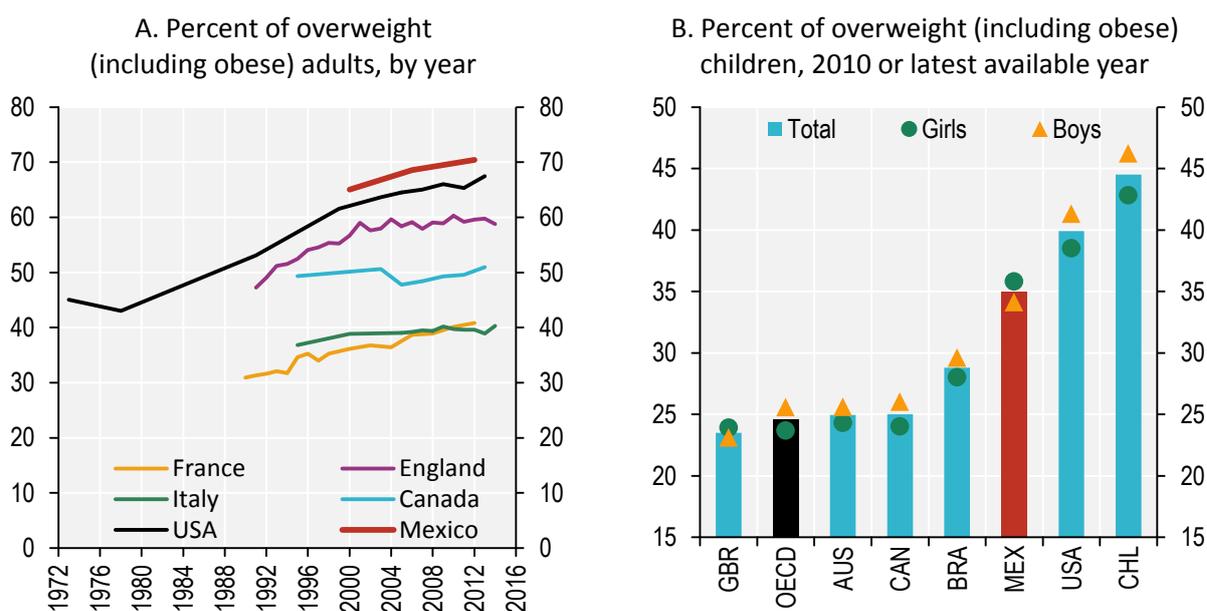
Mexico's low life expectancy relative to other OECD countries is in part due to harmful health-related behaviours such as poor nutrition and high obesity rates (Figure 2.9). Mexico has the second highest obesity prevalence worldwide, with more than one person in three considered obese. Mexico ranks fourth in adolescent obesity among OECD countries.

Mexico's multisectoral strategy to address obesity rates is based on three pillars: public health, medical care, and sector regulation. In particular, the country has introduced measures to increase public and individual awareness of obesity and associated non-communicable diseases. A national programme on healthy eating and physical activity focusses on health promotion and communication. It updated nutritional criteria and guidelines for food and beverages in schools at the national level and enforced strict norms in advertisements targeted at children. It also established specialised obesity and diabetes management units, and addressed legal and fiscal aspects of overweight and obesity. Most famously, in January 2014, Mexico implemented a new tax of 8% on non-essential food with an energy density equal or exceeding 275 Kcal per 100 grams, and 1 peso (EUR 0.06) per litre on sugar-sweetened beverages. The tax was fully incorporated into the final consumer price.

Recent evaluations revealed that purchases of taxed beverages decreased at annual rates between 5.5% and 12% in the first two years after implementation, and taxed food between 5.1% and 10.2% in the first year after implementation. Households at the lowest socio-economic level, which have the highest overweight and obesity rates, reduced their purchases of taxed beverages the most in both years. This suggests that in addition to the effect on purchasing behaviour among households sensitive to price increases, the tax may, together with other measures, contribute to positive health outcomes in the long run.

Mexico is committed to fighting obesity across generations. The OECD's 2010 *Fit not Fat* publication and regular *Obesity Updates* provide comparative statistics and analyses of the impacts of different health interventions.

**Figure 2.9. Obesity remains an important issue in Mexico**



Source: OECD (2017), *Obesity Update 2017*, [www.oecd.org/health/health-systems/Obesity-Update-2017.pdf](http://www.oecd.org/health/health-systems/Obesity-Update-2017.pdf).



## FOSTERING THE WELL-BEING OF MEXICAN PEOPLE

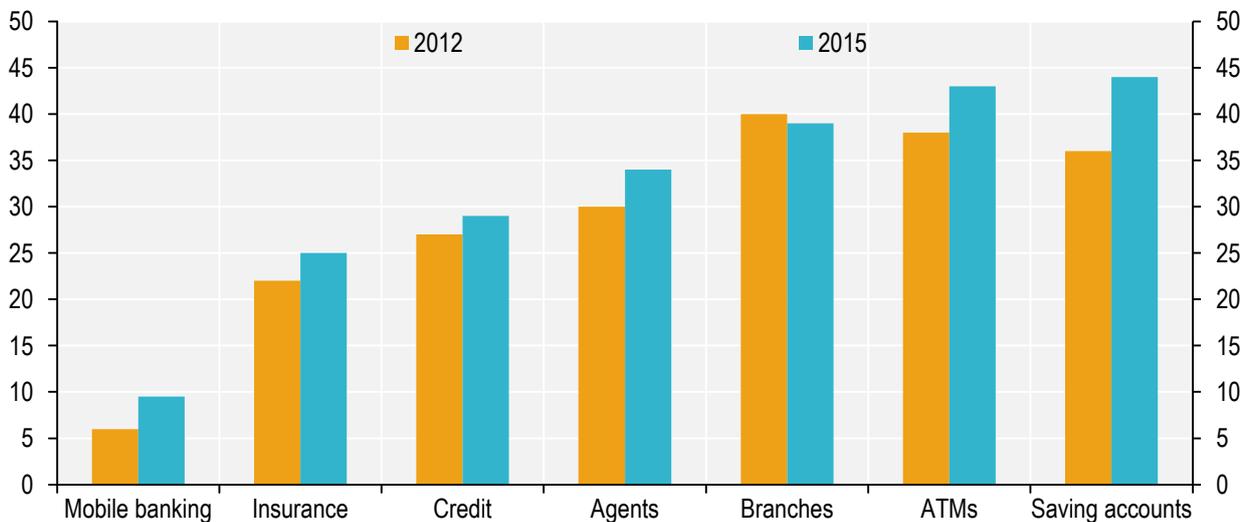
### FINANCIAL REFORM IS CONTRIBUTING TO A MORE INCLUSIVE MEXICO

Mexico's financial sector reform was supported by assessments contained in various editions of OECD *Economic Surveys*. The 2017 edition included a dedicated section on financial inclusion. The 2016 *Pension Review of Mexico* examined, amongst other measures, policy options to increase financial literacy.

A financial sector that lacks scope and breadth not only constrains productivity but also limits the role that consumption and investment smoothing can have in tempering macroeconomic volatility. In 2014, Mexico initiated financial sector reforms aimed at strengthening the regulatory environment, increasing competition, and lowering the costs of borrowing for small and medium-sized enterprises. Reforms also set out to improve Mexico's financial inclusion. Financial inclusion is not only causally related to growth but is also associated with increased levels of self-employment and entrepreneurship, household consumption, and the empowerment of women. Launched in 2014, the Integral Programme for Financial Inclusion provides financial education, credit, programmed savings, insurance and other products and services to beneficiaries of social programmes. In 2016, Mexico's National Financial Inclusion Strategy was finalised.

Thanks to these reforms, the level of credit formalisation has improved, household and corporate sector credit has increased, and the share of people using financial services and financial access points has risen (Figure 2.10). There is still a long way to go, however, as there are still important differences in the accessibility of financial services and access points across Mexican municipalities.

**Figure 2.10. Use of financial services and access points has increased**  
Percentage of adults using a particular financial service or access point



Source: OECD (2017), *OECD Economic Surveys: Mexico 2017*, [http://dx.doi.org/10.1787/eco\\_surveys-mex-2017-en](http://dx.doi.org/10.1787/eco_surveys-mex-2017-en).

## BOOSTING GROWTH AND COMPETITIVENESS



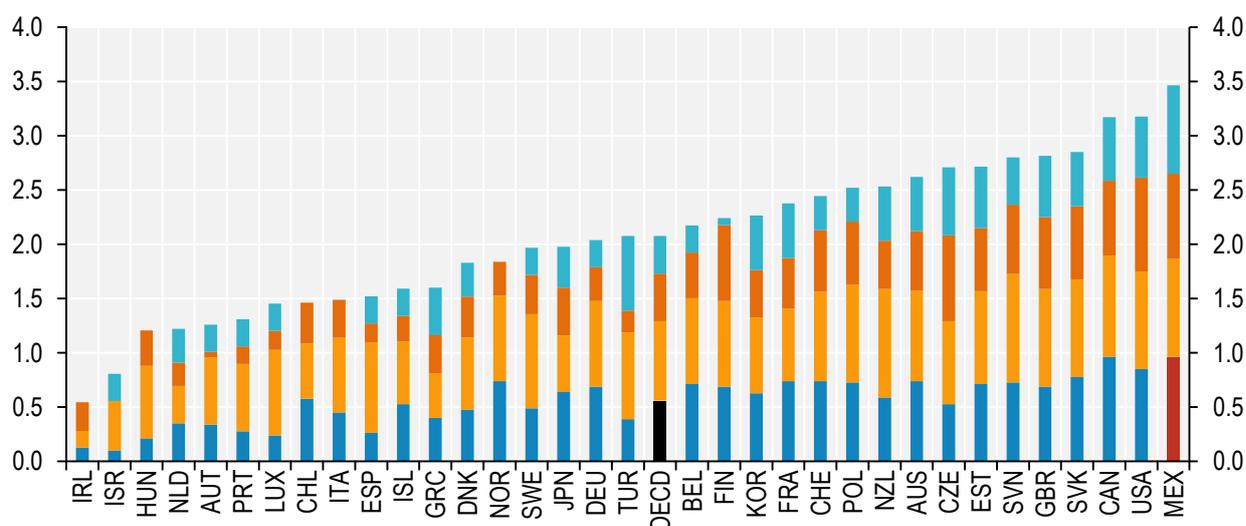
### MEXICO HAS STRENGTHENED ITS REGULATORY FRAMEWORK

To boost economic growth, Mexico embarked on an aggressive programme to reduce administrative burdens (i.e. the time in monetary terms necessary for citizens and businesses to comply with formalities) by 36%, which was finalised by the end of 2016. The government also launched an ambitious initiative to promote regulatory quality at the subnational level. The *Justicia Cotidiana* programme directly engages the federal government with state and municipal governments to simplify business licenses and construction permits, implement commercial oral trials, reduce local administrative burdens and diagnose regulatory reforms in key sectors. A constitutional reform to establish a national policy on better regulation was approved in February 2017. In addition, the system of *ex ante* impact assessment of draft regulations and public consultation in Mexico is performing at a high standard, ensuring that regulations are aligned with their public policy objectives and promote economic activity. Public consultation in this process ensures that stakeholder views are taken into account and helps to gather evidence for effective policy-making. According to the *OECD Regulatory Policy Outlook 2015*, Mexico's stakeholder engagement in the rule-making process is one of the most sophisticated in the OECD (Figure 3.1).

At the same time, challenges such as continuing and deepening efforts to improve regulatory quality at all levels of government remain. A recent assessment by Mexico's Coordinating Council of Businesses rates the average performance of states on regulatory improvement policy at 1.77 and that of municipalities at 1.05 on a maximum scale of 5. The general law derived from the constitutional reform on regulatory improvement remains to be discussed and approved by Congress. In addition, Mexico could further strengthen its consultation system by systematically consulting stakeholders early on to gather opinions on the nature of problems and potential solutions, including through the use of "green papers". Thresholds should be used to trigger *ex post* evaluations of all major regulations and not only technical ones, as is currently the case.

Mexico's actions to strengthen regulatory management are consistent with the recommendations made by the OECD in its 2014 report on *Regulatory Policy in Mexico*. The OECD is also supporting regulatory reform by analysing regulatory barriers to competition in several sectors of Mexico's economy and by working directly with subnational governments to strengthen their regulatory frameworks.

**Figure 3.1. Mexico excels in stakeholder engagement practices**  
Stakeholder engagement in developing subordinate regulations



Note: The vertical axis represents the total aggregate score across the four separate categories of the composite indicators. The maximum score for each category is 1, and the maximum aggregate score for the composite indicator is 4.

Source: *OECD Regulatory Indicators Survey 2014*, [www.oecd.org/gov/regulatory-policy/measuring-regulatory-performance.htm](http://www.oecd.org/gov/regulatory-policy/measuring-regulatory-performance.htm).

## BOOSTING GROWTH AND COMPETITIVENESS

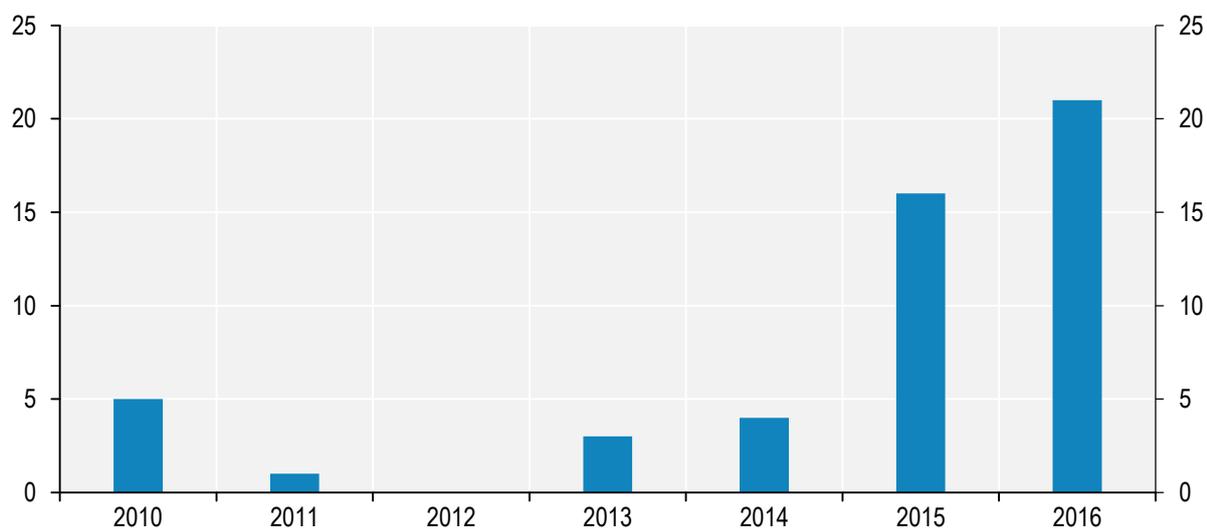
The OECD helped the Mexican government strengthen competition law enforcement through an in-depth analysis of the strengths and weaknesses of the country's competition policy framework presented in its 2012 *Better Policies Series* report. An ongoing OECD project with COFECE aims at further increasing the effectiveness of the agency's actions.

### REFORMS HAVE STRENGTHENED COMPETITION LAW ENFORCEMENT

In 2013, Mexico's Federal Economic Competition Commission (COFECE, in charge of all sectors except telecommunications) was strengthened and transformed into a constitutionally autonomous body with the power to regulate access to essential facilities and remove barriers to competition through broad market investigation powers. The independence, reformed judicial oversight and increased budget followed OECD recommendations and enabled the authority to enhance implementation of recently acquired powers to make "dawn raids", unannounced site inspections to search for documents. The 2013 reforms also established the Federal Institute of Telecommunications, an independent entity for the regulation of telecommunications, including competition law enforcement.

Absolute monopolistic practices are often considered as the highest crime under competition law. They encompass a broad spectrum of wrongdoing stemming from companies agreeing with each other in order to restrict competition. Agreements can focus on price, quantity, market allocation and other key facets of competition. Preventing such conduct is important, as such practices have been shown to increase average prices between 20% and 30%. The successful prosecution of economic cartel cases is time-consuming and depends on clear and convincing evidence. While the number of cases leading to charges has not increased substantially in the last few years (which is understandable, as cases often take three or more years to investigate), the number of dawn raids has increased substantially (Figure 3.2). The 2013 reforms have therefore yielded substantial benefits for competition law enforcement in Mexico.

**Figure 3.2. The number of dawn raids increased significantly following the 2013 reforms**  
Unannounced site inspections conducted by COFECE, by year



Source: Mexican Federal Economic Competition Commission (COFECE).

## BOOSTING GROWTH AND COMPETITIVENESS



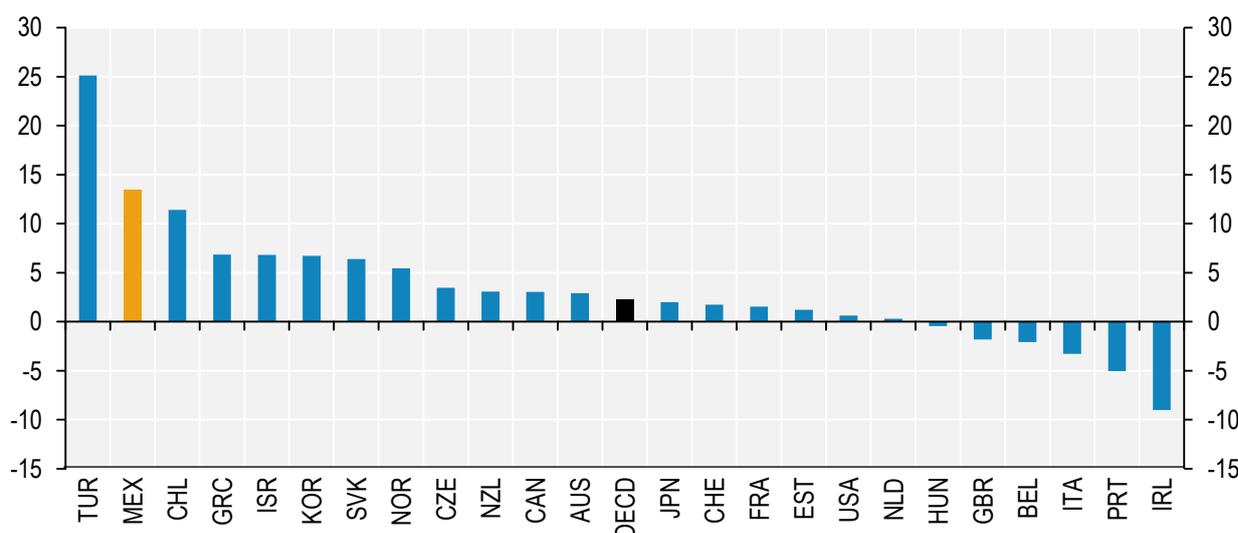
### MEXICO HAS RECOGNIZED THE IMPORTANT ROLE OF SMALL AND MEDIUM-SIZED ENTERPRISES FOR INCLUSIVE GROWTH

Small and medium-sized enterprises (SMEs) are at the centre of Mexico's Programme to Democratise Productivity, a range of reforms which have contributed to a better business environment (Figure 3.3). Early in its mandate, the Peña Nieto administration established the National Institute of the Entrepreneur (INADEM), responsible for the design, co-ordination and implementation of federal SME and entrepreneurship policies. The creation of INADEM has helped to improve the coherence of SME policies and increase government attention to new and small business development. Moreover, Mexico's efforts to increase transparency in its Entrepreneur Fund – the main source of programme funding for SMEs – constitute a best practice and are in line with the recommendations of the OECD's 2013 review of SME and entrepreneurship policies in Mexico. For example, project proposals are selected by an independent evaluation panel according to clear and publicly available selection criteria, and the names of government-supported enterprises are published online. In 2017, the Entrepreneur Fund was ranked at the top of Mexico's Index of Performance of Federal Public Programmes.

The OECD advised the Mexican government on its strategic approach to SME policy and provided comparative analyses of good practices for enhancing productivity in small enterprises in traditional sectors.

Mexico's SME policy has focused both on boosting productivity in very small enterprises in traditional industries (e.g. retail trade), and on fostering high impact entrepreneurship. In the first case, policy support has taken the form of business incubators for basic enterprises, a micro-franchise support programme, and a large-scale programme encouraging both the upgrading of managerial skills and ICT adoption. In addition, the 2013 reform of the corporate fiscal regime aims at fostering small business formalisation by offering discounted rates, over a 10-year period, on the personal income tax rate of small business owners whose annual revenues are less than MXN 2 million. As part of efforts to foster high-growth SMEs, Mexico has provided support to a network of business incubators and accelerators working with promising start-ups and growth-oriented SMEs and set up 40 public-private venture capital funds.

**Figure 3.3. Loans to SMEs have grown at a sustained pace**  
Average annual growth rate in outstanding SME loans, 2012-15



Note: Average annual growth rate of outstanding SME loans (adjusted for inflation) in the period 2012-2015.

Source: OECD (2017), *Financing SMEs and Entrepreneurs 2017: An OECD Scoreboard*, [http://dx.doi.org/10.1787/fin\\_sme\\_ent-2017-en](http://dx.doi.org/10.1787/fin_sme_ent-2017-en).

## BOOSTING GROWTH AND COMPETITIVENESS



### TELECOMMUNICATION AND BROADCASTING REFORM HAS INCREASED ECONOMIC COMPETITIVENESS AND SOCIAL WELL-BEING

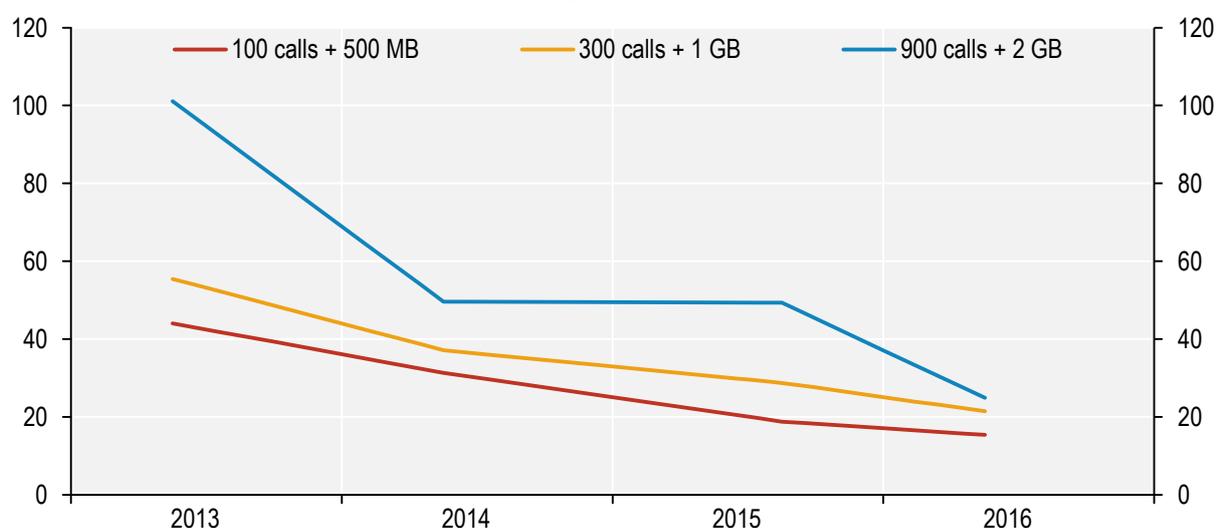
The OECD's 2012 *Review of Telecommunication Policy and Regulation in Mexico* made 31 recommendations to improve Mexico's legal and regulatory framework, 28 of which have been fully implemented. The other three have either been partially implemented or are in the course of being implemented. In 2016, Mexico hosted the OECD Ministerial Meeting "Digital Economy: Innovation, Growth and Social Prosperity", which put forward directions for public policies to foster the development of the digital economy.

The 2013 telecommunication and broadcasting reform triggered an important modernisation of both sectors. The results, illustrated in the 2017 *OECD Telecommunication and Broadcasting Review of Mexico*, have been remarkable. The number of mobile broadband subscriptions rose from 24 million in 2012 to over 74 million in 2016. Prices for mobile telecommunication services declined by 61% for the OECD medium-usage basket and by 75% for the OECD high-usage basket (Figure 3.4). Both the telecommunication and broadcasting sectors experienced significant growth and foreign competitors have entered the telecommunication and satellite markets. Investment in telecommunication has increased. The *Red Compartida* – a shared wholesale wireless network – will likely further spur investment. Mexico completed the switchover from analogue to digital television, freeing up spectrum for mobile communication services, and licensed a third national free-to-air television network.

To further promote competition, following the regulator's 2017 preponderance review, the Federal Telecommunications Institute imposed new remedies to the preponderant agent, including mandatory functional separation between the wholesale and retail operations of the fixed-service provider (Telmex-Telnor). These measures have opened networks to other firms, which will stimulate the development of both fixed and mobile communication services.

It is now crucial for Mexico to maintain reform momentum and further encourage competition, including by reducing the regulatory burden for Telmex-Telnor to address the high market concentration in pay-TV and broadcasting. Market conditions could be further enhanced by abolishing the special tax on telecommunication services. Mexico would also benefit from a better alignment of the roles of different authorities in formulating and implementing digital economy policies.

**Figure 3.4. Prices for mobile broadband services fell sharply after the reform**  
Mobile broadband prices in Mexico, USD PPP



Source: OECD (2017), *OECD Telecommunication and Broadcasting Review of Mexico*, <http://dx.doi.org/10.1787/9789264278011-en>.

## BOOSTING GROWTH AND COMPETITIVENESS



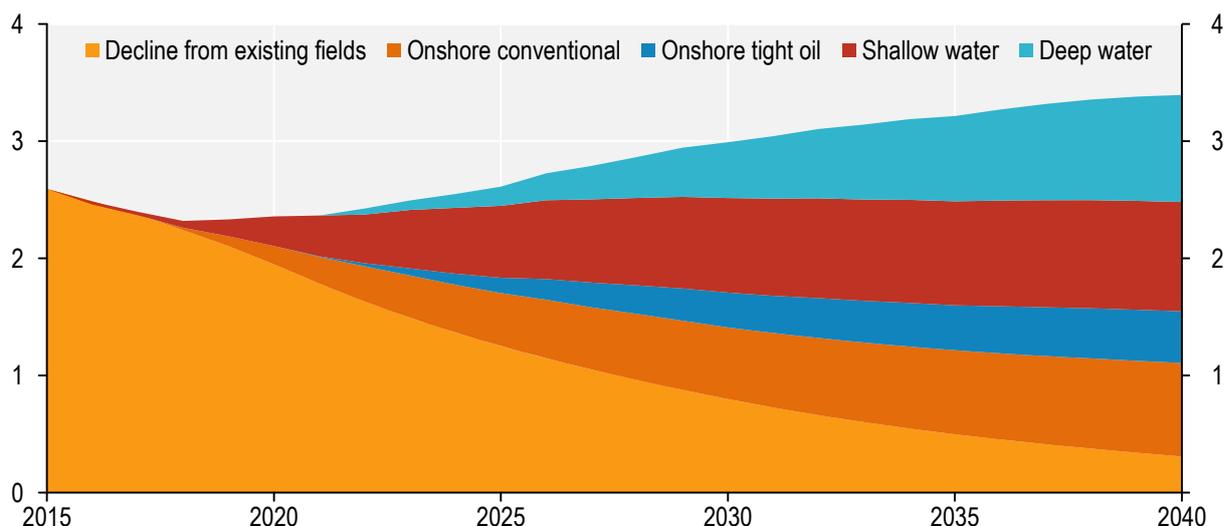
### MEXICO'S 2013 ENERGY REFORM IS A LANDMARK IN THE ENRIQUE PEÑA NIETO PRESIDENCY

After years of declining oil production, high electricity production costs and a lack of funding and technology to exploit new energy resources, Mexico has opened up its long-closed oil, gas and electricity sectors to private operators. Oil production prices have been liberalised, allowing market entry by both domestic and foreign investors in the exploration, production and transportation of oil by-products and gas, as well as the refining and marketing of hydrocarbons. Governance of the state-owned petroleum company PEMEX has been strengthened with the appointment of independent directors responsible for establishing its strategic vision. Existing sector regulators have been granted new powers and status, including legal independence and budgetary autonomy, and new ones have been created. Deep reforms have also reorganised the electricity sector. Competition from new entrants is now allowed. The state-owned power enterprise CFE has been completely unbundled, effectively ending its monopoly. The auction system for renewables is a world reference and has attracted some of the lowest price projects globally.

The reform has been a great success, boosting private investment, energy production (Figure 3.5), technological know-how, tax revenue, and business confidence. Improved access to US shale gas has allowed Mexico to rapidly move from costly and polluting oil-fired electricity generation to gas. The transition to a different energy mix will also contribute to improving Mexico's environmental performance. Continued success of the energy reform hinges on consolidating the independence of sector regulators and more focus on long-term planning to support stable regulatory activity.

*Mexico's energy reform is in line with recommendations made in the OECD's Economic Surveys. The OECD has supported the government in the area of energy policy through its 2017 Performance Reviews of Mexico's three energy regulators, the 2017 Public Procurement Review of PEMEX, and the IEA report Energy Policies Beyond IEA Countries: Mexico 2017.*

**Figure 3.5. Thanks to the energy reform, oil production is expected to increase again**  
Oil production in Mexico in the New Policies Scenario, in millions of barrels per day, 2015-40



Source: IEA (2016), *Mexico Energy Outlook*, <http://dx.doi.org/10.1787/9789264266896-en>.



## PROTECTING MEXICO'S ENVIRONMENT

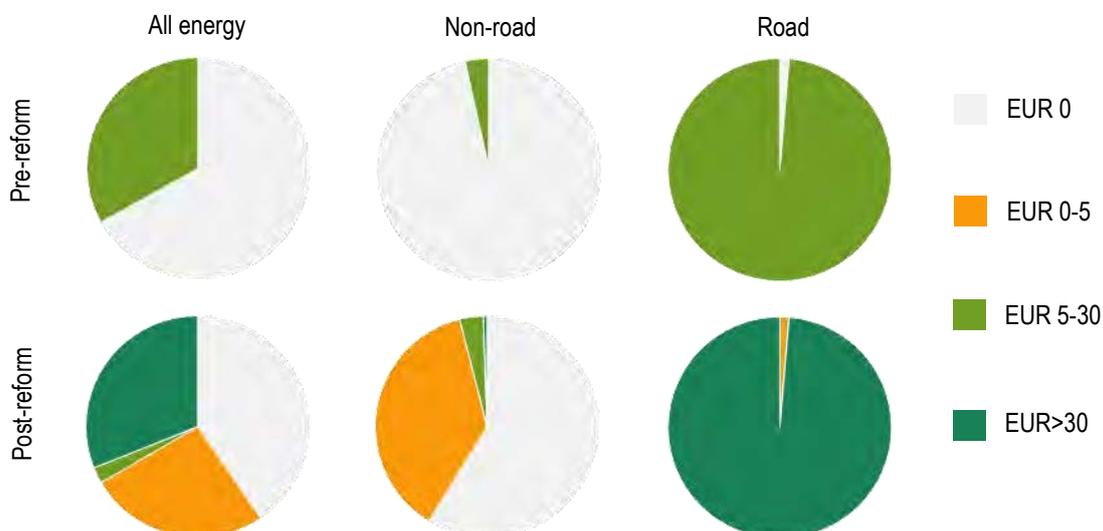
### MEXICO HAS MADE IMPORTANT PROGRESS ON FIGHTING CLIMATE CHANGE

Mexico's environmental reforms are in line with OECD recommendations. The OECD's 2013 Environmental Performance Review of Mexico recommended the introduction of an excise tax on transport fuels and energy products reflecting the environmental costs associated with their use, and providing targeted cash transfers to those adversely affected.

Mexico was the first emerging country to submit its nationally determined contribution (NDC) ahead of the UNFCCC COP21. It ratified the Paris Agreement on 16 September 2016. The government committed unconditionally to reducing greenhouse gas emissions (GHGs) and short-lived climate pollutants, implying a 22% reduction of GHGs and a 51% reduction of black carbon, relative to business-as-usual levels, by 2030. Further reductions of up to 36% and 70%, respectively, could take place under certain conditions. Furthermore, Mexico is one of only six countries to have submitted a long-term low-GHG development strategy. In its 2015 Energy Transition Law, Mexico confirmed its 2024 clean energy target of 35% and introduced intermediate targets. Changes to the climate change law now mandate the creation of a cap-and-trade system. Mexico has also strengthened the recognition of resilient ecosystems as a means to reduce adverse impacts of climate change.

However, efforts are still needed to achieve these targets, given rapidly growing emissions from the energy and transport sectors (the latter being an important source of air pollution). Significant steps were taken in 2014, when Mexico moved away from transport fuel subsidies and increased excise tax rates on transport fuels. A new carbon tax was simultaneously introduced (including on fuels outside of the road sector), improving the extent to which the external costs of energy use are reflected in prices (Figure 4.1), but rates are very low. Progressively increasing carbon taxes and ensuring that rates more uniformly reflect the carbon content of fuels would send a strong price signal of the external costs of carbon emissions. The gradual implementation of the reforms had initially increased their political acceptability, but increasing tax rates further may necessitate social transfers for those affected by the increase in energy prices. Mexico should develop estimates of the cost effectiveness of the various mitigation instruments on a cost-per-tonne of CO<sub>2</sub> basis, both in terms of short-term reductions and in delivering the 2030 target. Falling costs of renewable technologies provide an opportunity to accelerate decarbonisation of the electricity supply.

**Figure 4.1. Mexico increased the share of emissions covered by a carbon price, but at low rates**  
Percentage of carbon emissions priced at different levels



Source: Arlinghaus, J. and K. van Dender (2017), "The environmental tax and subsidy reform in Mexico", <http://dx.doi.org/10.1787/a9204f40-en>.

## PROTECTING MEXICO'S ENVIRONMENT



### ACCESS TO DRINKING WATER AND SANITATION HAS IMPROVED

Mexico has made considerable progress in improving access to drinking water (Figure 4.2) and sanitation and in reducing water-related diseases. The government has also taken steps to raise the efficiency of water use. Water use tariffs have been significantly increased since 2014, and incentives to better use and treat water have been introduced. The 2013 energy reform facilitated investment in water-efficient practices in the electricity sector. The National Water Reserves Programme was established to help ensure future water availability. The Rain Harvest and Ecotechnics National Programme aims at strengthening water management in Mexico's poorest rural areas. Internationally, Mexico has played a key role in promoting a new approach to water management, including in the High-level Panel on Water.

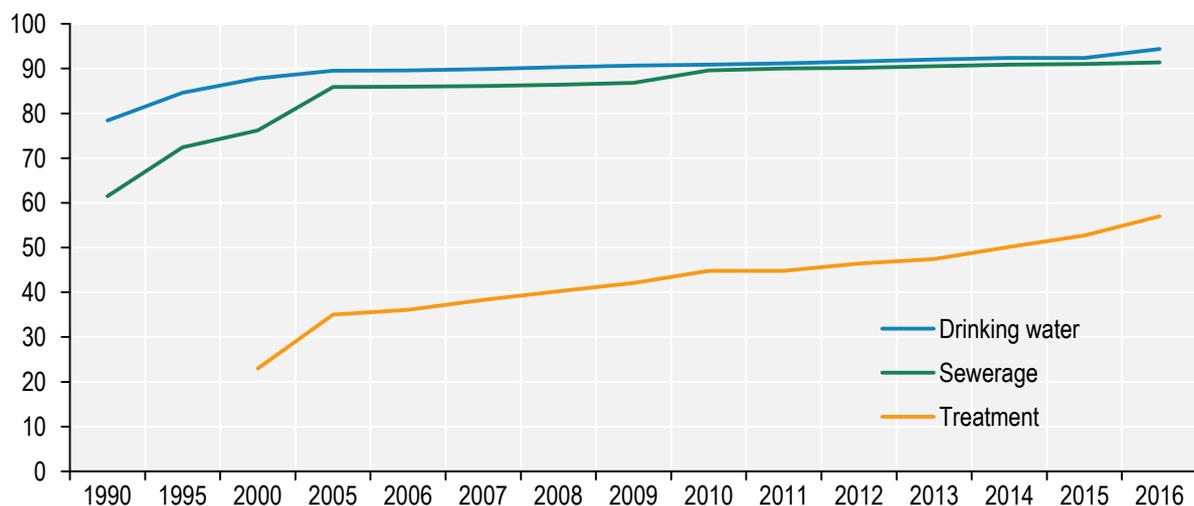
Due to population growth, water management remains an ongoing challenge. Over the next two decades, Mexico will have to provide an additional 36 million people with drinking water and 40 million people with sanitation services. In addition, Mexico still has the lowest rate of connection to public wastewater treatment plants in the OECD. The government has put in place instruments to tackle these issues. The Social Infrastructure Fund supports local and state governments in developing basic social infrastructure, including drinking water and sanitation.

Building on recent progress, Mexico needs to promote water use efficiency across sectors, allocate water where it creates most value and encourage investment in water infrastructure. This requires addressing multi-level and river basin governance challenges to reduce inconsistencies between federal and basin priorities, strengthening the role, capacity, prerogatives and autonomy of river basin councils and establishing platforms to share good practices. Removing overlaps and gaps in regulatory functions is also key. Mexico needs to better ensure consistencies across water, agriculture and energy policies and phase out subsidies for water pumping and fuel used to pump groundwater, instead considering direct income support where needed. Adjusting water allocation regimes can also help promote water use efficiency within and across sectors. Water service tariffs need to be raised further to reflect operation and maintenance costs and improve water bill collection.

The 2013 OECD report *Making Water Reform Happen in Mexico* provided evaluations and recommendations in support of Mexico's water policy reforms. The related *Policy Dialogue* consulted over 100 stakeholders at federal, state and basin level.

**Figure 4.2. Access to drinking water continues to improve**

Evolution of drinking water, sewerage and treatment, in % of coverage, 2005-15



Sources: National Institute of Statistics and Geography (INEGI), Population and Housing Census 2010, Population and Housing Count 2005; National Water Commission (CONAGUA), Survey between official censuses 2015.



## PROTECTING MEXICO'S ENVIRONMENT

The OECD helped the Mexican government in its endeavour to protect the country's biodiversity through the 2013 *Environmental Performance Review*, which examined Mexico's institutional and policy framework for the conservation and sustainable use of biodiversity resources and provided recommendations for a more co-ordinated, coherent and strategic approach.

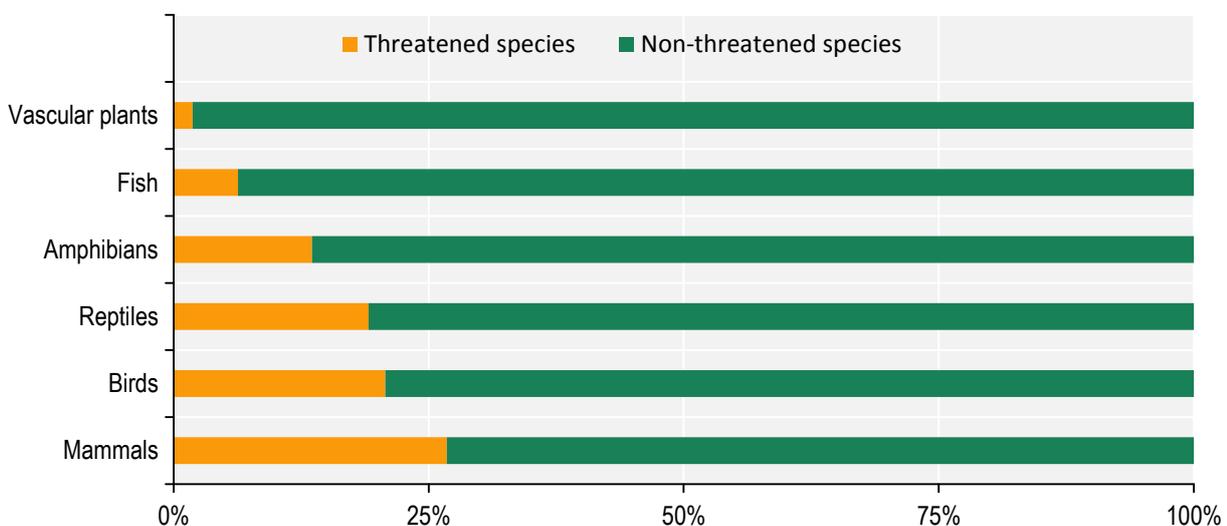
### MEXICO HAS MADE CONSIDERABLE PROGRESS IN PROTECTING ITS BIODIVERSITY

Mexico is a mega-diverse country, home to 10-12% of the world's biodiversity and a large number of threatened species (Figure 4.3). Biodiversity has been under pressure from land use change and deforestation, overexploitation, invasive alien species, pollution and climate change. As these pressures are linked to policies in other sectors, mainstreaming biodiversity is crucial to conservation and sustainable use.

The government has made notable progress in better protecting biodiversity through laws, strategies and programmes, together with strong institutions. Between 2009 and 2015, 11 new protected areas were established, increasing coverage to 91 million hectares (comprising 21 terrestrial and 70 marine protected areas). Mexico now protects 23% of its coastal and marine areas, exceeding the Aichi target of 10%. A commitment to further increase protection has been cemented in Mexico's National Biodiversity Strategy and Action Plan 2016-30. Under this plan, extensive action was taken to create new Marine Protected Areas (MPAs), increasing total coverage to over 700 thousand km<sup>2</sup>. The Revillagigedo National Park is now the most extensive fully protected marine area in North America. Mexico also uses a range of other policy tools to conserve and sustainably use biodiversity, including subsidies (many of which aim at improving the conditions of local and indigenous communities) and payment for ecosystem services (PES). Mexico's PES programme covers 3.25 million hectares of forest and is one of the world's largest.

It is important for Mexico to strengthen its institutional framework for biodiversity management by establishing a high-level interministerial task force and to reform environmentally harmful government support in sectors such as agriculture and fisheries (e.g. agricultural subsidies that promote land-use change, VAT exemption on agrochemicals, electricity subsidies for agriculture, and fuel subsidies for fisheries). Mexico would also benefit from streamlining programmes to support indigenous people and the environment, increasing the focus on capacity building and achieving social and environmental objectives more efficiently.

**Figure 4.3. Mexico is home to a large number of threatened species**  
Percentage of all species in a given category, 2016 or latest available year



Note: Threatened species are defined as IUCN Categories "critically endangered", "endangered" and "vulnerable".

Source: OECD Environmental Statistics Database, <http://stats.oecd.org>.

## STRENGTHENING MEXICO'S GOVERNANCE SYSTEMS



### IMPORTANT STEPS HAVE BEEN TAKEN TO IMPROVE THE JUDICIAL SYSTEM

Mexico's justice system faces immense challenges in terms of credibility, effectiveness and timeliness. To better meet justice needs, Mexico has amended its constitution and other laws to facilitate the enforcement of constitutional rights. Laws now ensure that judges give priority to analysing the motives behind disputes rather than to the formalities of the proceedings. Moreover, citizens are now able to file claims online.

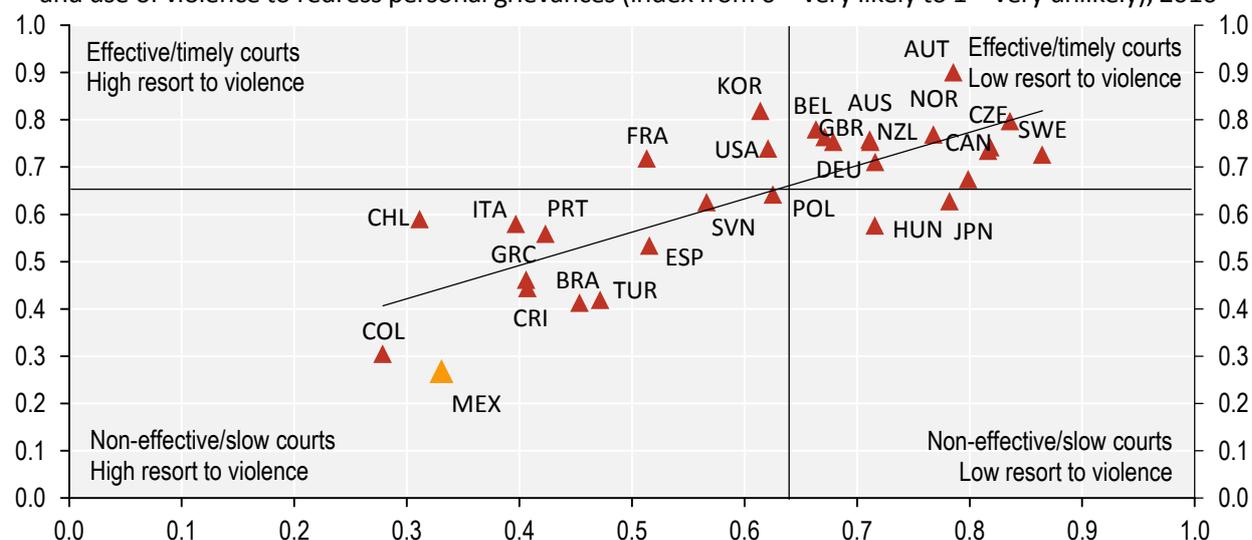
Mexico also profoundly changed its criminal justice system, which is key to improving personal safety and overall well-being and the rule of law (Figure 5.1). 2016 saw the launch of the new adversarial criminal justice system after eight years of implementation. A unified National Code of Criminal Procedure (now to be applied at federal and state levels) was passed to make sure the right of due process is well protected. Victims now have a formal and relevant role in their cases and the length and fairness of procedures has improved substantially.

To improve everyday justice, the *Justicia Cotidiana* initiative, an innovative and extensive consultation process to understand and address the daily legal needs of citizens and businesses, was launched in 2014. This led to reforms aimed at making rules simple to understand, encouraging the use of alternative dispute settlement mechanisms, automating procedures and reducing red tape. For example, to enhance court efficiency and contract enforcement, orality was introduced in commercial proceedings at the first instance. According to the Federal Commission for Regulatory Improvement, the reduction of the number of proceedings since 2011 in Mexico City (from 38 to 21) coincided with a drop in their length (from 400 to 270 days). In 2013, reform to economic and fiscal shelters and the establishment of nationwide specialised jurisdictions in competition, telecommunication and broadcasting aimed at raising the quality of judicial decisions, reducing the length of judicial review and giving effect to competition reforms more broadly. Addressing the lack of training of criminal justice stakeholders (police, lawyers, judges and staff) is now crucial.

To support Mexico's justice system reform, the OECD worked with Mexico's Institute for Competitiveness to assess the country's policy-making cycle.

**Figure 5.1. Personal safety is strongly linked to the effectiveness of the justice system**

Effectiveness/timeliness of criminal adjudication system (index from 0 = least effective to 1 = most effective) and use of violence to redress personal grievances (index from 0 = very likely to 1 = very unlikely), 2016



Note: The horizontal and vertical lines depict the OECD averages.

Sources: OECD (2017), *Government at Glance*, [http://dx.doi.org/10.1787/gov\\_glance-2017-en](http://dx.doi.org/10.1787/gov_glance-2017-en); OECD (2015), *Measuring Well-Being in Mexican States*, <http://dx.doi.org/10.1787/9789264246072-en>.



## STRENGTHENING MEXICO'S GOVERNANCE SYSTEMS

### THE ANTI-CORRUPTION AGENDA IS MOVING IN THE RIGHT DIRECTION

The *OECD Integrity Review of Mexico* provided over 60 proposals for action to improve the integrity of Mexico's public sector. In addition, the OECD has been working with several federal states, including Coahuila, Nuevo León, Sonora, and Mexico City, to strengthen their integrity frameworks and public procurement practices. Working with COFECE, the OECD has also carried out several projects to help fight bid rigging in public procurement, notably in the healthcare and energy sectors.

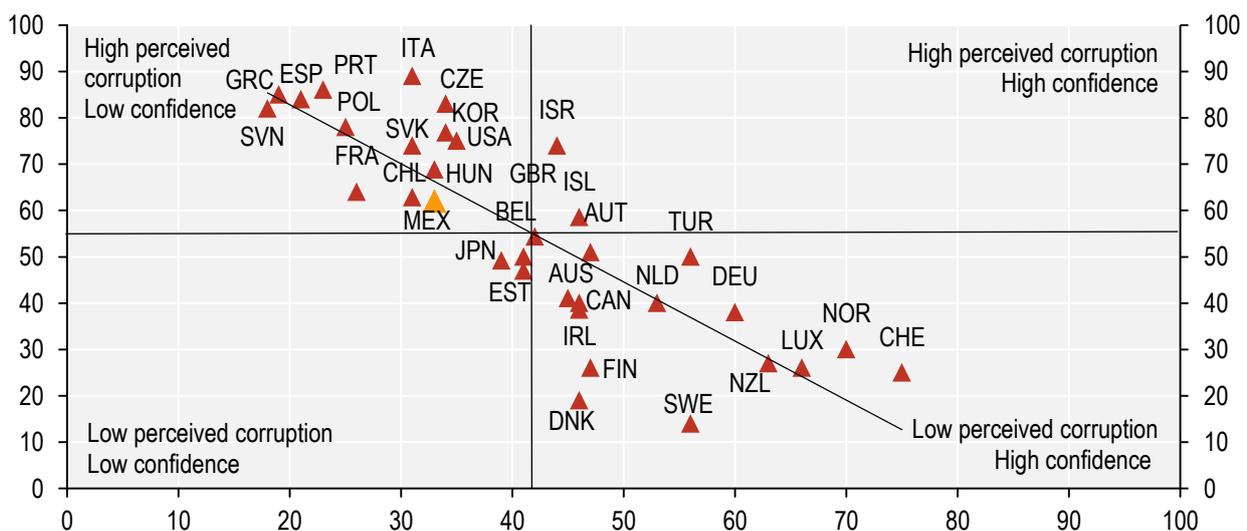
While fighting corruption has long been a priority of Mexico, its policymakers have, at times, come up short in passing effective long-term reform. Under the leadership of President Peña Nieto, Mexico has taken steps towards a major overhaul of its institutional and legal frameworks.

The National Anti-corruption System (SNA) was created to improve and facilitate co-ordination in the prevention, detection and sanctioning of corruption. The General Law of Administrative Responsibilities (GLAR) was published, heightening penalties for firms and individuals that engage in corruption or commit administrative violations. The GLAR promotes public transparency by obliging public servants to disclose their tax returns, submit asset declaration statements and declare conflicts of interest. It established a national auditing system to harmonise anti-corruption and integrity policies and capacities across Mexico. Guidelines for companies seeking to implement anti-corruption compliance programmes and codes of conduct were established. The Integral System of Citizen Complaints was launched, allowing citizens to submit complaints and allegations of corruption online and to follow cases until their conclusion. The Code of Ethics for federal public servants and the Rules of Integrity for the Exercise of Public Functions show that Mexico is committed to developing civil servants that comply with the principles of legality, honesty, loyalty, impartiality and efficiency.

While these reforms created a good foundation to fight corruption, implementation is still a work in progress. Mexico is in the midst of appointing several key positions, including the Anti-corruption Attorney, and states are developing the necessary legal reforms to implement local anti-corruption systems. In co-ordination with the OECD, the Ministry of Public Administration has designed an Action Plan which assigns responsibilities for implementing each of the recommendations made in the *OECD's Integrity Review of Mexico*, together with a calendar to monitor compliance.

**Figure 5.2. Corruption and trust in government are strongly linked**

Percentage of people having confidence in the national government and percentage of people believing that corruption is widespread in government, 2014



Note: The horizontal and vertical lines depict OECD averages.

Source: OECD (2015), *Government at a Glance, 2015*, [http://dx.doi.org/10.1787/gov\\_glance-2015-en](http://dx.doi.org/10.1787/gov_glance-2015-en), based on data from the World Gallup Poll.

## STRENGTHENING MEXICO'S GOVERNANCE SYSTEMS



### MEXICO HAS GREATLY INVESTED IN OPEN GOVERNMENT REFORMS

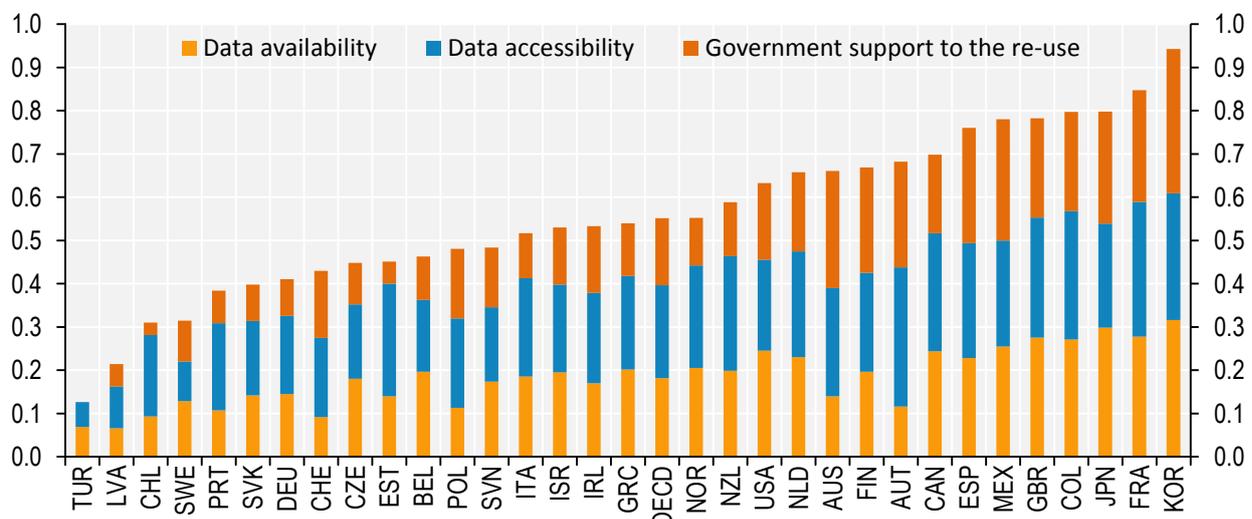
Mexico was one of the first countries to fully link its national development, public reform, open government and digital agendas. The National Development Plan 2013-18 includes open government as an objective and open data as a transversal enabler. Mexico has pioneered involving other branches of power, subnational governments and independent state institutions in open government processes, creating the Open Mexico Network and the Alliance for an Open Mexican Parliament in 2014. The country has further expanded its legal framework for open government. In 2015, the General Transparency Law was approved, requiring state authorities in all branches, autonomous organisations, trade unions and any other entities dealing with public funds to make all information generated public. The law also strengthened the role of the National Institute for Transparency, Access to Information and the Protection of Personal Data.

The Office of the President's leadership since 2013 in co-ordinating the National Digital Strategy has been critical in fostering the development of open data initiatives both nationally and internationally. The 2015 Executive Decree on Open Data was an important sign of high-level political support. As a result of these efforts, Mexico now ranks among the top 5 OECD countries in the OECD's OURdata Index (Figure 5.3).

Despite this impressive progress, there is scope for more improvement, especially by further institutionalising the country's efforts. This includes consolidating the role of the national open government co-ordinator and elaborating a fully-fledged national open government policy to make open government a cross-cutting instrument to address socio-economic challenges. Potential also remains to further foster public sector efficiency and innovation and strengthen the economic and social impact of policy through open data related projects. To this end, it is necessary to further strengthen open data policies, develop data and digital literacy among citizens and businesses, and foster partnerships with the private and academic sectors. It is also crucial to further develop improve impact evaluation of open government initiatives and to use open data for evidence-based policy-making in broader sectoral policy goals such as civil protection and risk management.

**In pushing forward its open government agenda, Mexico has benefitted greatly from peer learning with other OECD countries. For example, Mexico is the co-chair of the OECD Network on Open and Innovative Government in Latin America and the Caribbean. In 2016, Mexico led the initiative on 'what works and doesn't work' in digital service delivery of the Working Party of Senior Digital Government Officials.**

**Figure 5.3. Mexico has made great strides towards open government data**  
OECD Open, Useful and Reusable data (OURdata) Index, 2017



Source: OECD Survey on Open Government Database, <https://qdd.oecd.org/subject.aspx?Subject=589A16C1-EADA-42A2-A6EF-C76B0CCF9519>.



## STRENGTHENING MEXICO'S GOVERNANCE SYSTEMS

### IMPROVING THE EFFECTIVENESS

#### OF STATE AND LOCAL GOVERNMENTS REMAINS CHALLENGING

**Mexico's ambition to strengthen the effectiveness of state and local governments will benefit from several OECD reviews, including *Territorial Reviews* of Morelos, Valle de México, Puebla-Tlaxcala and Chihuahua. The 2015 *Urban Policy Review of Mexico* includes an examination of subnational capacity issues for urban development.**

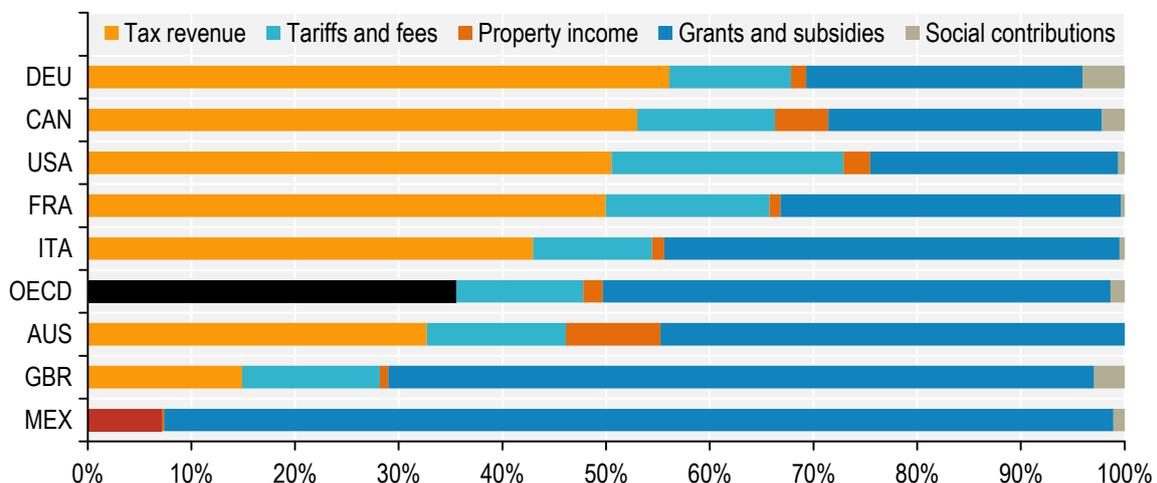
Mexico's National Development Plan 2013-18 stressed the importance of involving all sectors and levels of government in fostering national development and productivity. Subnational governments need clear competencies and responsibilities, together with adequate capacity, to fulfil this role. States and municipalities are responsible for 50% of total public expenditure, in line with the OECD average of federal countries. The difference between taxing power and spending responsibilities is significant compared to the rest of the OECD, however. Mexico's subnational governments have a low share of resources from tax revenue, among the lowest of OECD countries (Figure 5.4).

With the amendment of the Law of Fiscal Co-ordination, which included the creation of a Programme of Institutional Development, the government has steered Mexico towards improving fiscal federalism relations. Still, Mexico remains a centralised country. Large spending areas are controlled by the federal government. Local government expenditure and investment shares in GDP and public spending are among the lowest in the OECD. At the same time, the distribution of functional responsibilities across levels of government is complex, undermining the effectiveness of policy delivery and public investment. Federal powers are extensive and sometimes overlap with responsibilities of states and municipalities. The inability to re-elect municipal leaders for more than one term has caused frequent changes in priorities. During the Peña Nieto administration, re-election has become possible, which will help improve subnational government capacity and effectiveness.

Mexico needs to redefine responsibilities across levels of government to improve policy delivery, along with adequate resources. It would also benefit from improved subnational governance to raise the impact of public investment. Indeed, OECD evidence shows that the quality of subnational governance is directly connected to investment outcomes. The most efficient way to achieve greater economic and social cohesion is by improving the quality of government.

**Figure 5.4. States and municipalities funded mostly through grants and subsidies instead of taxes**

Subnational government revenue by source, % of total subnational government revenue, 2015



Source: OECD (2017), *Subnational governments in OECD countries: key data*, <http://www.oecd.org/regional/regional-policy/Subnational-governments-in-OECD-Countries-Key-Data-2017.pdf>.

## STRENGTHENING MEXICO'S GOVERNANCE SYSTEMS



### DISASTER RISK MANAGEMENT CONTINUES TO IMPROVE

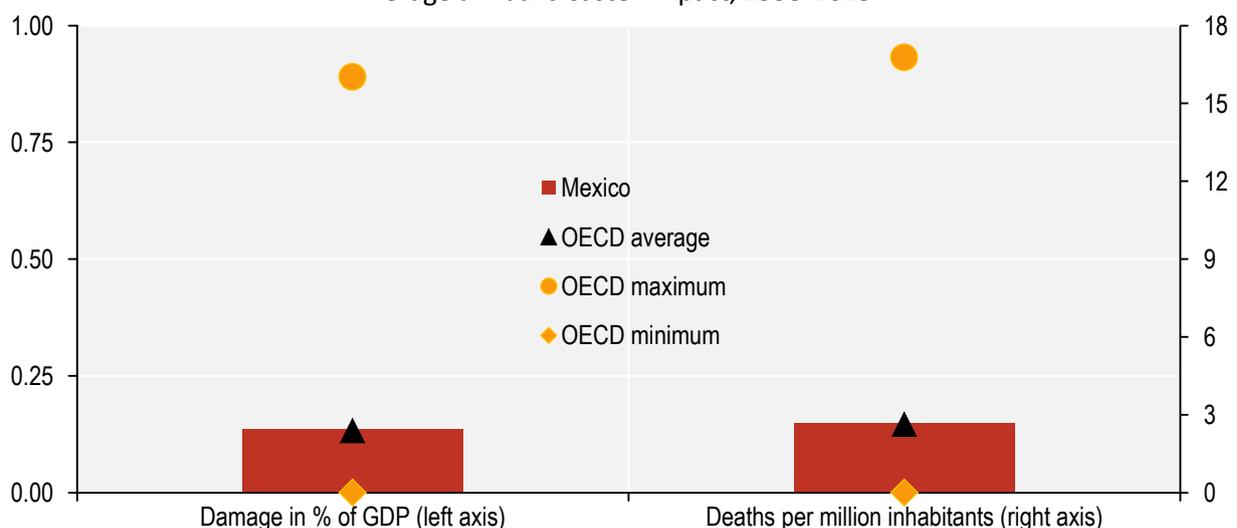
Mexico is acutely aware of its significant exposure to natural hazards (Figure 5.5). The National Civil Protection System was created in 1986 and gradually strengthened over time, putting greater focus on risk prevention. Several additional tools have been launched since 2013. The Digital National Risk Atlas and the National Atlas of Vulnerability to Climate Change inform citizens and firms about natural risks. The General Law of Human Settlements, Territorial Planning and Urban Development puts local governments in charge of administrating and approving the zoning of population centres in their territories. In September 2017, the operating rules of the National Fund for Natural Disasters were changed to better support private stakeholders in recovering from disasters. The Special Climate Change Programme 2014-18 sets out measures to raise resilience to climate change.

Response to the earthquakes that struck the capital in 2017 demonstrated the remarkable resilience that Mexico has achieved through its reforms. The events proved the effectiveness of early warning systems, usefulness of hazard maps and availability of comprehensive building codes, in addition to efficient financial management, interinstitutional co-ordination between federal ministries and international emergency support. All these factors helped save lives and limit economic disruptions. The strong volunteer network that supported public response and recovery efforts illustrated Mexico's society-wide culture of risk.

Still, the recent earthquakes underlined persisting challenges. Co-ordination gaps between emergency response stakeholders and across levels of government and with civil society hampered a more effective response. Despite changes to construction regulation after the 1985 earthquake, breaches and shortcomings in building inspections and construction monitoring contributed to building collapse. The earthquakes also showed that land use and urban planning do not take risk information sufficiently into account. Improving the monitoring and evaluation system to assess progress on climate change adaptation and land use planning could also help to increase resilience.

**The OECD supported the Mexican government in strengthening its disaster risk management through the 2013 Review of Disaster Risk Management Policies, which provided an overview of the challenges faced by SINAPROC as well as an agenda for action.**

**Figure 5.5. Mexico is highly vulnerable to natural disasters**  
Average annual disaster impact, 1995-2015



Source: EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, 2016.



## STRENGTHENING MEXICO'S GOVERNANCE SYSTEMS

Close co-operation with the OECD has improved transparency in public procurement, one of the most critical elements determining efficiency and quality in infrastructure delivery. The OECD also works with the Mexican government in the delivery of the New National Airport of Mexico City.

### INFRASTRUCTURE GAPS ARE CLOSING AND GOVERNANCE HAS IMPROVED

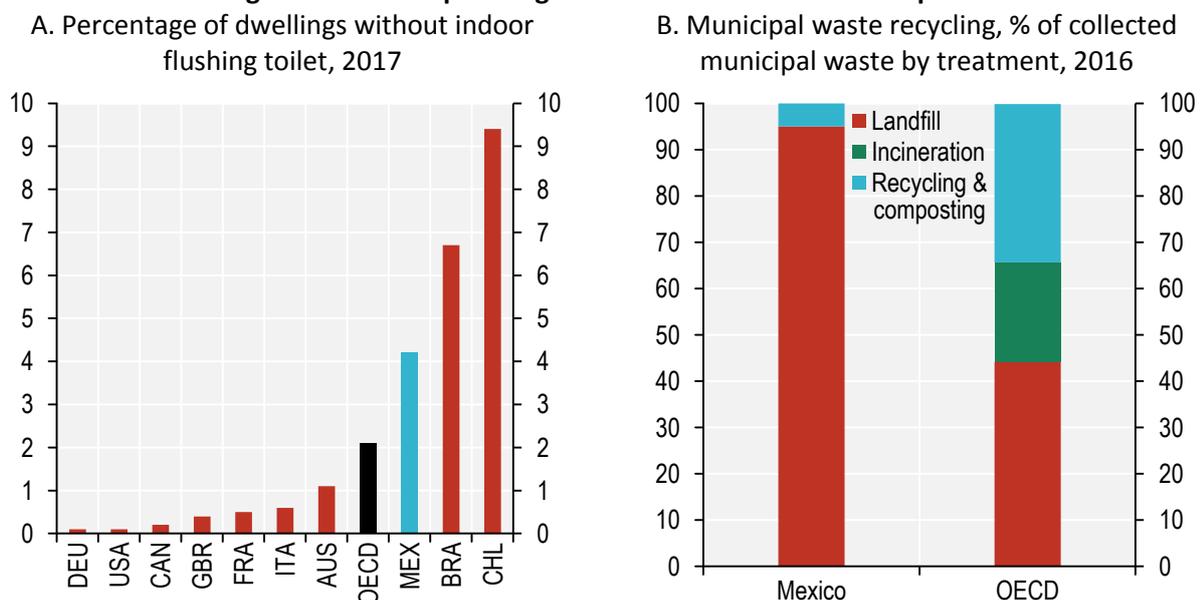
The Peña Nieto administration has taken important steps to strengthen public policies in various areas, from freight transport to housing, public procurement, risk management, ethics and conflict of interest, up to the effective development of mega-projects such as the New International Airport of Mexico City.

Past housing development often occurred in places lacking basic facilities, leaving many low and lower-middle income families with inadequate services (Figure 5.6, panel A) and poor access to good schools, hospitals and employment opportunities. Since 2013, the situation has improved, with 8 out of every 10 houses built within urban containment perimeters. The National Housing Programme 2014-18 intends to address geographical segregation by socioeconomic status by narrowing the gap in good quality housing, improving interinstitutional co-ordination in urban services delivery and moving to a more sustainable urban development mode, including by recycling more waste (Figure 5.6, panel B). Educational Infrastructure Certificates and National School Infrastructure Bonds are funding improvements to education infrastructure.

Mexico City's New International Airport was designed to the highest standards of sustainability. Infrastructure to access the airport needs to be future-proof and the airport needs to be part of broader efforts to improve strategic regional transport planning and interjurisdictional integration in the Valle de México. The airport authority (GAMC) has enhanced its control and accountability processes, stepped up its code of conduct, and set up an ethics committee. Procurement has become more transparent. The government negotiated an air service agreement with the United States and increased the FDI share to 49% in regular and non-regular national air transport, non-regular international air transport and specialised air transport.

Despite these achievements, significant challenges remain. The corporate governance reform of GAMC needs to continue and a mechanism for a whole-of-government co-ordination around the New International Airport of Mexico City needs to be established. Procurement activities between different entities could be better co-ordinated and pre-tendering activities strengthened.

**Figure 5.6. Urban planning and infrastructure need to improve**



Sources: OECD (2017), OECD Better Life Index 2017, [www.oecdbetterlifeindex.org](http://www.oecdbetterlifeindex.org); OECD Green growth Indicators 2016, <http://stats.oecd.org/>.

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# Turning Pink Slips into Red Tape: The Unintended Effects of Employment Protection Legislation

Harlan Holt\*      Joshua R. Hendrickson†

January 26, 2015

## Abstract

This paper presents evidence on the link between employment protection legislation (EPL), such as mandated severance packages for fired workers, and the rate of unemployment in a cross-country panel data set of OECD countries from 1990-2013. We use both a traditional fixed effects panel specification with lags of the policy variable, and also a unique structural panel vector autoregression (PVAR) method to determine the long-run dynamic interaction between employment protection legislation and unemployment. We confirm that a tightening of EPL for permanently employed workers causes a significant and persistent increase in unemployment, but the effect is only apparent at long lag lengths, some 2-5 years after the law has been implemented. We find weaker evidence that employment protection legislation specific to temporary worker contracts also increases unemployment.

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# 1 Introduction

Over the past five years, there has been a considerable effort on the part of many developed countries including Spain, Estonia, the UK, Italy and Portugal, to reduce the costs imposed on employers associated with hiring workers. While labor legislation debates typically revolve around the use of unemployment benefits and their distortionary effects on workers' labor-leisure allocation, relatively less attention is paid to the effects of Employment Protection Legislation (EPL), which is designed to protect the worker from losing his or her job by imposing additional costs on employers who fire their workers. These policies include state-mandated severance packages for firing workers, lengthy prior notice to terminated employees, and other administrative costs associated with dismissal.

The purpose of this paper is to determine whether the passage of additional EPL increases the rate of unemployment in a country, an effect that the prior literature has had difficulty confirming. To address this question, we present a fixed-effects panel model with lags of the policy variable and a panel vector autoregression (PVAR) specification which, to our knowledge, has not been used to address this question. The reason for the policy lag is that the choice of policy is not independent of the unemployment rate. Policy makers will base their legislative decisions in part on the current unemployment rate, thus any model that estimates the contemporaneous relationship between EPL and unemployment will have estimates that are biased and inconsistent due to simultaneity bias. The choice of policy however will be unrelated to the future unemployment rate because it is unobserved at the time the choice of policy is made. The policy lags also allow us to construct the basis for a long-run adjustment mechanism.

Even though we could conceivably identify a contemporaneous effect through the use of instrumental variables, focusing on the contemporaneous effect obscures much of the story. For example, consider the passage of an employment protection law. In the short run, it is improbable that firms would immediately begin firing workers because of the costs of immediately changing output decisions, in addition to the additional penalties resulting from firing workers under the new legislation. Thus in the short run, we should expect very little increase in unemployment, even if the effect is correctly identified. Instead, we expect that any interesting structural change in the unemployment rate will occur in the long run, and perhaps very far off into the future. This is because firms will much more likely wait for workers to leave their positions voluntarily, and then simply close the vacancy if they do not want to incur the cost of potentially firing the new worker. This means that previous research that focuses on the contemporaneous effect, underreports the

true impact on unemployment, *even if* the effect is correctly identified and estimated. In fact, if the effect is strong enough, we may even observe a temporary drop in the unemployment rate if businesses find it too costly to fire workers in the short run leading to an incorrect assessment of the policy's effects.

We believe this is a subtle point that deserves special emphasis. Many prior studies have found that increased employment protection have no effect on the unemployment rate (See: Addison and Grosso (1996), Nickell (1997), OECD (1999), Addison et al. (2000), and many others).<sup>1</sup> Our goal in this paper is not to refute or overturn prior studies that show that increased EPL has no effect on unemployment in the short-run. Rather, we heartily agree with these findings, and believe them to be very plausible. Our broader goal is to show that failure to investigate the long-run effects of this policy can lead to an incorrect policy recommendation. There are a number of reasons why the long-run effects may have escaped the prior literature. Foremost among them is that available data on EPL has only been available since the mid 1990's. Long-run investigation of policy requires a sufficiently large number of observations on the time dimension for the data to show the effects.<sup>2</sup>

We revisit the hypothesis that EPL increases unemployment, however we focus on the long-run impact of these types of policies.<sup>3</sup> We follow up the traditional panel model with a time series approach to identify the long-run adjustment path with a panel vector autoregression (PVAR). The use of the PVAR model is important for two reasons. First, the PVAR specification allows for the assumption that unemployment and EPL are endogenously related, but allows us to identify the causal effect without the problems of instrument selection. Second, we are able to use the PVAR model to compute the dynamic response of unemployment to a change in EPL rather than just the initial marginal effect. This allows us to observe how the unemployment rate evolves over time after an exogenous change in EPL.

In both the fixed effects panel model and the PVAR model, we find evidence that an increase in the degree of employment protection leads to significantly higher unemployment, but the effect is only apparent

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<sup>1</sup>It is arguable that this is the general conclusion of the literature.

<sup>2</sup>A simple panel fixed-effects regression can estimate the impact of EPL on unemployment. However if we want to examine a long-run relationship on a data set with time dimension  $t = 1, \dots, T$  by including the policy variable from the year prior, we must cannot analyze the first and last time observations (the policy lag for year 0 is unobserved, and data in response to a policy change in year  $T - 1$  does not exist to be analyzed yet). Each subsequent lag we include in the regression consumes two additional degrees of freedom. Thus if you wished to examine the long-run effects of policy 4-5 years into the future, the researcher must throw away 8-10 years of observations. Because the EPL indices on OECD countries used by most studies on EPL only became available after Grubb and Wells (1993), this study in particular would not have been possible as recently as 5-10 years ago, much less 15-20 years ago when many of the referenced papers in this field were published.

<sup>3</sup>The impact on the unemployment rate in the long-run should not be confused with the long-run unemployment rate which is defined as the percentage of the labor force that has been unemployed for longer than one year. This study predominantly concerns the former, not the latter.

at long lag lengths, some 2-5 years after the adoption of new legislation. This implies that while these policies produce a persistently higher unemployment rate, the effects may not become apparent until well after the policy has been implemented, and potentially may even appear counter to the political cycle since many legislatures in developed countries are turned over only once every two to six years.

## 2 Employee Protection Legislation

### 2.1 The Effects of EPL on Unemployment

Historically the direct policy implementation of EPL across most developed countries has concerned the length and generosity of severance payments and the amount of notice or administrative effort required by firms to terminate the employment of a worker. While these are the two largest components of EPL, labor market rigidity produced through legal protections for collective bargaining as well as an array of other policies can also be interpreted as an employment protection law.

The implementation of EPL can be thought of as having a similar goal as unemployment insurance (UI), but targeted instead at those who have work rather than those who are out of work. To the extent that it allows workers to smooth consumption by reducing the uncertainty of their permanent income, it does function somewhat like UI or other types of unemployment benefits. However, as stated by Blanchard, Jaumotte, and Loungani (2013), the intended policy goals are somewhat different: "The purpose of *unemployment insurance* is to reduce the *pain* of unemployment. The purpose of *employment protection* is to reduce the *incidence* of unemployment."<sup>4</sup> Thus, in accordance with the stated policy goals, we can generate a direct testable hypothesis of whether or not EPL actually achieves its stated purpose of reducing the incidence of unemployment.

The desire to have the state enforce a level playing field between employers and employees has been historically popular in political circles, especially with regards to policies that do not bear an explicit pecuniary cost to the government. Pro-labor policies are often aimed at limiting the supposed advantages that a firm enjoys when bargaining over wages and employment status. For example, Section 1 of the U.S. National Labor Relations Act of 1935, which outlines the right for workers to organize, explicitly states that "The inequality of bargaining power between employees who do not possess full freedom of association or actual liberty of contract and employers who are organized in the corporate or other forms of ownership associa-

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<sup>4</sup>Emphasis from the original authors.

tion substantially burdens and affects the flow of commerce . . . by depressing wage rates and the purchasing power of wage earners in industry.” Similarly, researchers have argued monopsony buying power of firms that arises from either specialization or switching costs provides the basis for pro-labor type policies such as the minimum wage and the right to unionize. The implementation of EPL has a similar political motive because these policies are intended to create better outcomes for laborers by making firms pay an extra cost to fire their workers. This paper takes no position on whether or not these employer advantages exist or to what degree they affect labor market freedom. However, we do wish to examine whether the use of legislative force to overcome these perceived disadvantages can actually lead to adverse outcomes for workers.

As stated, the intended goal of these policies is to reduce the incidence of unemployment. However, there is strong reason to believe that while EPL certainly does disincentivize the firm from firing or laying off its existing labor force, the policy may not work as intended. Increasing the cost to firing workers means that firms will likely be more reluctant to hire them in the first place. Since it doesn’t directly impact the firm’s productivity, it is unlikely that firms will react instantly to a tightening of EPL by firing workers. Instead they will likely be more inclined to simply close positions that workers leave voluntarily, leaving fewer positions for new workers to compete over. This means that the most important effects of the policy exist in the *long run*. The short run effect is ambiguous and perhaps not all that meaningful. Unemployment may rise, fall, or remain the same immediately after employment protection legislation is passed. Understanding this is crucial to correctly assessing the policy’s effectiveness. Econometrically, this means that any attempt to estimate the effect of employment protection laws on unemployment must necessarily focus on the long run effect of the policy, including examining the dynamic adjustment path from one level of unemployment to the next.

This logic is consistent with labor market search models, such as that of Pissarides (2000), which imply that increases in the ex ante cost of hiring workers leads to an increase in the unemployment rate and a reduction in the vacancy rate in the steady state. In addition, EPL might increase unemployment if it impedes labor market reallocation as others such as Bertola and Boeri (2002) have suggested. Thus, in the long run, we expect to see fewer vacancies and a higher unemployment rate directly contradicting the stated purpose of the law.

Since the number of vacancies is expected to fall, we should expect the additional unemployment generated by these policies to be persistent. That is, we do not expect to see a spike of unemployment which gradually returns to the steady state as we might with an ordinary aggregate demand or supply shock. Thus,

the type of unemployment created by these incentives is likely to be structural and long-term in nature.

## 2.2 Recent Work

Lazear (1990) uses a panel model of 20 developed nations with a quadratic time trend to show that increases in mandatory severance packages to terminated employees have a positive effect on the unemployment rate, and a negative effect on the employment-to-population ratio, the labor force participation rate, and average hours worked. Lazear also estimates the regression with country fixed effects, and is able to confirm his results for all of the dependent variables *with the exception of* the unemployment rate. Lazear justifies this by stating that if employment protection causes structural unemployment, then over the long run we would expect more discouraged workers and the unemployment rate might indeed *fall*. This, however is unlikely given that his panel results reflect the instantaneous change in unemployment due to an increase in severance pay, whereas a discouraged worker problem is likely only to arise after a considerable time has passed.

Lazear (1990), and most of the accompanying literature says little about how long it can take for the effects of changes in the structure of employee protection legislation to appear in the aggregate employment statistics for an economy. Most studies focus on the contemporaneous impact of employment protection legislation on unemployment. The results have generally suggested that EPL has little to no effect on the unemployment rate. For instance, Addison and Grosso (1996), Nickell (1997), OECD (1999), Addison et al. (2000), Nickell et al. (2005), Sarkar (2013), and Avgadic (2013) all fail to find evidence that the unemployment rate is increased after additional employment protection is legislated. In addition to Lazear (1990), Scarpetta (1996), and Heckman and Páges (2000, 2003), find evidence of an increase in unemployment after an increase in the degree of employment protection.<sup>5</sup>

A more uncontroversial finding from the literature is that flows into and out of unemployment fall, suggesting that unemployment becomes more stagnant as a result of stricter EPL.<sup>6</sup> Once again, this is not surprising given the likely transmission mechanism as described above. If businesses do not immediately react to additional EPL by firing workers, but by reducing the amount of vacancies they post in the future, then this is consistent with both a small, nonexistent, or possibly even negative short run effect of EPL on unemployment and reduced employment flows.

<sup>5</sup>For an excellent survey of the literature, see Addison and Teixeira (2003).

<sup>6</sup>For examples, see OECD (1999), Kugler and St. Paul (2000), and Autor et al. (2007).

### 2.2.1 Estimation Issues

Despite the considerable depth of the literature, there is really no careful identification of the long-run trend of employment after a change in EPL. This is likely because of the availability of the data. Reliable EPL indicators as explored by Grubb and Wells (1993) have only been established since Lazear's (1990) seminal work. The most widely used data set, the OECD's EPL indicators, only report data back to 1990 for most nations, which means we have less than 25 years of data for this particular measure. It is relatively easy to establish contemporaneous effects in a panel model, however when trying to identify the long-run effect, the researcher inevitably consumes degrees of freedom quickly. What's more, as Nickell (1981) shows, dynamic panel models which attempt to incorporate a partial adjustment mechanism such as an AR(1) process for unemployment, like those suggested by Arellano and Bond (1991), can produce biased estimates in samples with a relatively small time dimension. It is no coincidence then that most of the previous studies on this topic do not even attempt to identify the long run marginal effects of EPL on unemployment, instead focusing on the contemporaneous impact of those laws. Sarkar (2013) summarizes the need for more long-run tests by stating, "A panel regression based on a short-term time series has the constraint of studying only the instantaneous relationship, which may not be meaningful; rather it may be spurious."

The focus on the contemporaneous effect of EPL is potentially problematic from an empirical perspective since the unemployment rate and EPL might be simultaneously determined. Many examples indicate why simultaneity might be a problem. Politicians may choose EPL to combat spells of high or rising unemployment. It is also possible that implementation lags may cause the policy to actually be enacted after the recessionary spell has passed leading to a spurious correlation between low or falling unemployment and EPL. On the contrary, since EPL policies represent a form of unemployment insurance for currently employed workers, it may be that EPL policies have greater political support when unemployment is low or falling as the economy exits a recession. If we wish to investigate how EPL affects unemployment, we must take into account the fact that unemployment almost certainly affects EPL as well.

In addition, even if these problems are corrected for the contemporaneous relationship between EPL and unemployment, there may still be reason to be skeptical about the policy implications of not finding a statistically significant relationship. This is because the long run *structural* relationship between EPL and unemployment may be very different than the instantaneous one. This would very likely be the case if the transmission mechanism described above is indeed the case. If employers react to a sudden tightening of

EPL not by immediately firing workers, but by closing future vacancies, then we should very likely see the detrimental effects of the policy only in the future, not in the immediate aftermath of the policy.

A recent attempt to reconcile these issues is Sarkar (2013), who uses an error correction panel model to examine the effects of EPL on unemployment. Sarkar fails to find a long run relationship between general unemployment and EPL, though he does find evidence that additional EPL can increase the proportion of the long-term unemployed population, which can reduce production which then further aggravates long-term unemployment.<sup>7</sup> Nonetheless, there is reason for skepticism about these results. First, Sarkar's model requires that the variables are non-stationary. In samples with a small number of observations across time, however, unit root tests are likely to over-accept the hypothesis of a unit root. Examination of the autocorrelation functions (ACFs) of the variables used in this paper cast doubt on the presence of non-stationarity. In Figure 1 we plot the ACFs for the G-7 countries plus Australia for the sample period 1990-2013. Visual inspection of the plots show that the autocorrelation of unemployment is statistically greater than zero for no more than a two year lag. Thus, we find the hypothesis of a unit root in unemployment doubtful. Second, Sarkar's failure to find a long-run relationship between EPL and unemployment is based on an absence of evidence of cointegration between the two variables. However, Sarkar finds evidence that EPL is cointegrated with GDP. Thus, the relevant test within the context of a vector error correction framework when there is cointegration is to test the hypothesis that the coefficient on EPL is equal to zero in the cointegrating vector rather than test for bivariate cointegration.

Whatever the mechanism, it is clear that the choice of EPL is partly determined by the present unemployment rate, thus any estimates of a contemporaneous effect of EPL on unemployment that do not take this into account are likely to be biased and invalid for policy inference. We address this in two ways. First, we use a fixed effects model to examine the effect of EPL on unemployment using various policy lags for employment protection. Second, we use a panel vector autoregression (PVAR) model to examine the effect of EPL on unemployment. Given the possibility of endogeneity, this second approach is important because tools like vector autoregression models treat all variables as endogenous. To our knowledge we are the first authors to pursue this latter approach.

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<sup>7</sup>Long-term unemployment here refers to the percentage of the labor force unemployed for longer than a year, not the long-run trend of unemployment.

### 3 Data

We measure the degree of employment protection using indexes of employment protection for permanent workers and for temporary workers constructed by the OECD. The OECD's EPL measures are compiled using 21 different individual indicators on mandatory severance packages and administrative costs of dismissal tiered by employee tenure and the pervasiveness of unions and collective bargaining at the industry and national level. The OECD organizes these measures separately for permanent and temporary workers. The data spans the 34 OECD member countries over the period from 1990 to 2012. Summary statistics for these variables and the unemployment rates by country are provided in Table 1. Each indicator is assigned a score from 0 to 6 based on answers from a questionnaire on the strictness of the labor code with regards to that particular indicator with 0 being the least strict, and 6 being the most. Each item in the survey is then assigned a weight and then added up into component scores for procedural inconveniences, length of notice and severance pay, difficulty of dismissal, and additional provisions for collective dismissal. These component scores are again weighted and then combined into a final employment protection score from 0-6.<sup>8</sup>

Shortly after Lazear (1990), the need for better measures of employee protection became apparent. Grubb and Wells (1993) suggested that new measures incorporate not only the level of mandatory severance packages, but the length of term of prior notice needed to be given to individuals, tiered measures for the level of tenure among employees, and the differences arising from permanent versus temporary work positions. The modern measures of employee protection are largely based on the Grubb and Wells methodology.

The remaining variables in our model are taken from the World Bank's World Development Indicators. These variables include the unemployment rate, the percentage of unemployed who are identified as long-term unemployed (over one year), government expenditures as a percentage of GDP, inflation as determined by the CPI for each country, and income per capita growth defined as the log difference of real per capita income in constant 2005 US dollars to serve as control variables. A brief summary of these data is presented in Table 2.

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<sup>8</sup>Since the scores for each category are weighted, and then aggregated, the final EPL measure assigned to each nation is not, in general, an integer value. This is beneficial in terms of the data since it increases the variation of EPL for the sample along both the cross sectional and time dimensions.

## 4 Fixed Effects Model

### 4.1 Model Specification

To examine the relationship between employment protection and unemployment, we begin with the following fixed effects model:

$$unemp_{i,t} = \beta_1 Perm_{i,t-k} + \beta_2 Temp_{i,t-k} + \beta'_X \mathbf{X}_{i,t} + a_i + a_t + u_{i,t} \quad (1)$$

where *unemp* is the unemployment rate in country *i* in year *t*, *Perm* is the value of the strictness of employment protection indicator for permanent work positions, and *Temp* is the value of the strictness of employment protection for temporary positions.  $\mathbf{X}_{i,t}$  is a vector of basic control variables for unemployment in which we include the inflation rate to control for Phillips' curve effects, the growth rate of real per-capita GDP to control for Okun's law, and real government expenditures. We also include year fixed effects,  $a_t$ , to control for any global factors such as the global financial crisis that began in 2008.<sup>9</sup>

The choice of the fixed effects model is due to the fact that unobserved heterogeneity between countries is likely correlated with the explanatory variables. For example, Venn (2009) finds that EPL is correlated with the countries' legal origins. EPL is also likely to be correlated with other factors, many of which will be unobservable concerning the connection between labor market structure and the legal environment in which it operates. Examples might include the favorability of judgements in labor proceedings by the country's judicial system, the degree of monopoly or monopsony power of firms in key industries, or other effects produced by unrelated and unobserved government policies.

### 4.2 Results

A drawback of any specification of this type is that the contemporaneous effect of the EPL measure will be determined simultaneously with the unemployment rate. This is because lawmakers may find it more difficult to pass EPL during periods of high unemployment or may be more determined to do so while the unemployment rate is low. Any estimate of the contemporaneous effect of EPL on employment will be endogenously determined by reverse causality and will be unsuitable for policy analysis. Because of the high degree of serial correlation with unemployment rates, it is doubtful that even the first or second lags

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<sup>9</sup>We also tested a specification with time trend instead of time dummies. The results were not significantly affected.

escape this endogeneity problem since the unemployment rate strongly depends on its previous value.

While the potential for simultaneity bias prevents us from saying anything about the instantaneous effect of the policy change, we can determine the long run effects of the policy by using lags of the policy since the future unemployment rate should not affect any policy change in the present. We use single, discrete lags of the policy variable for each regression, not a distributed lag. The choice of a single lag rather than a distributed lag is because the changes in EPL for each country are generally infrequent, at most occurring once every 5-10 years and sometimes not at all. Legislative overhauls of most sensitive national policy positions such as labor law often take considerable political effort, and the majority of votes needed to do so only occurs every so-often. Because of this, inclusion of a distributed lag of the policy variable is improper, because we would likely be introducing multicollinearity among the regressors which would reduce the precision of our coefficient estimates. We present the estimates of the specification using differing lag lengths of the policy variables in Table 3.<sup>10</sup>

As shown in Table 3, the EPL measure for permanent workers has a positive and statistically significant for lags of 2 - 5 years. The contemporaneous EPL measure for temporary workers is negative and statistically significant. However, we suspect that this is due to the potential for simultaneity bias. At the bottom of Table 3 we include the Akaike and Schwarz-Bayes Information Criteria (AIC and SBC) . The information criteria both uniformly decline as the lag gets longer indicating that the model fits better the further out from the policy change we get.

It is reasonable to suppose that if labor market rigidity were tightened through increases in EPL, we should also expect more of the workforce to become structurally unemployed as a result. This is because EPL may have uniform effects that differ across industries. For instance, we would likely expect firms that operate in industries that experience historically high turnover rates such as dining or retail to be affected more than historically low turnover industries such as finance. In this case, we would expect the workers displaced by this policy to have more difficulty finding suitable employment elsewhere, implying structural employment should rise. This type of unemployment is generally more painful for an economy because it tends to be persistent and longer lasting than other types. We use long-term unemployment as a proxy since direct measures of structural unemployment are not widely available. Using the same specification as equation (1), we present the results using long-term unemployment as a percentage total unemployment as

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<sup>10</sup>We also estimated equation (1) with a regional fixed effect to control for regional supply shocks such as a natural disaster, changes in regional trading patterns, or localized systemically important asset market conditions. We also included regionally clustered standard errors. These changes did not significantly alter the regression results.

the dependent variable. The results are presented in Table 4.

As shown in Table 4, the measure of employment protection for permanent workers is positive and statistically significant for both the model with a four year policy lag and the model with a five year policy lag. The long time lags should not be surprising. Structural unemployment takes time to appear in the data since it is, by nature, a long-term phenomenon. The increase in structural unemployment is problematic for governments. Structural unemployment is generally stubborn and can take time to dissipate, leading to more pressure over time on social safety nets to provide for the unemployed and the loss of taxable income from the newly created structurally unemployed.

## 5 Panel Vector Autoregression Model

In this section we provide evidence of the effect of employment protection on the unemployment rate using an estimation method that has not previously been used in the literature. Specifically, we use a panel vector autoregression (PVAR) specification similar to Holtz-Eakin, et al. (1988) to capture the long run effects of changes in EPL on the unemployment rate by focusing on the long run dynamic transmission of the policy impact on unemployment. The PVAR model has two key advantages. First, it allows us to preserve the effects of unobserved heterogeneity between countries while assuming that the variables are endogenous. Second, the PVAR allows us to recover the orthogonal policy innovations at the cost of imposing a sufficient number of identification restrictions on the data. We use the recovered policy innovations to plot the dynamic response path of the unemployment rate to a change in either of the EPL policy variables with an impulse response function (IRF). Intuitively, once the model is appropriately identified, the IRFs plot the dynamic path of the unemployment rate in response to an unexpected increase in EPL.

The PVAR model is given as

$$AY_{i,t} = B_0 + B_1Y_{i,t-1} + a_i + \varepsilon_{i,t} \quad (2)$$

where  $Y_{i,t}$  is a vector of endogenous variables,  $a_i$  are country fixed effects included to account for any non-time varying, unobserved heterogeneity among the countries,  $A$ ,  $B_0$ , and  $B_1$  are coefficient matrices, and  $\varepsilon_{i,t}$  is a vector of structural shocks.<sup>11</sup> Here, the term structural shock refers to an unanticipated change in a

<sup>11</sup>To estimate the regression equation in (2), we first need to transform the variables to remove the fixed effects by applying a Forward Orthogonal Difference (FOD) procedure as in Arellano and Bover (1995), also commonly known as a Helmert transformation. We then estimate a reduced form representation of (2) and use a Choleski decomposition to uniquely identify the structural shocks of the system. For those unfamiliar with VAR methods, the econometric details on the transformation and estimation procedure are

particular variable.

The vector,  $Y$ , includes the endogenous policy variables  $Perm$  and  $Temp$  from the panel regression earlier and the unemployment rate. It is important to note that equation (2) cannot be estimated directly because the model implies that  $Y_{i,t}$  is correlated with  $\epsilon_{i,t}$ , which violates standard estimation assumptions. As a result, we first have to estimate a reduced form representation of (2). After the reduced form estimation, we can recover the structural shocks by imposing a sufficient number of identifying restrictions on the matrix  $A$  in equation (2), which captures the contemporaneous relationships between the variables.

We use a Choleski decomposition to identify the model, which amounts to forcing  $A$  to be lower triangular with zero entries below the principle diagonal, and free parameters elsewhere. Intuitively, the Choleski decomposition is consistent with the assumption that the variables in  $Y_{i,t}$  have no contemporaneous effects on the variables ordered above them. This carries the potential drawback that the ordering of the variables in the regression equation matters for the estimates because the identifying assumptions change. As is common in the estimation of multiple time series using a Choleski decomposition, we test the model using different orderings of the variables to show that the estimates are robust to the identifying assumptions. The first identification strategy orders the unemployment rate first and the policy variables last. This is consistent with the assumption that the policy variables do not have a contemporaneous effect on unemployment. The second identification strategy order the policy variables first and the unemployment rate last. This is consistent with the assumption that the policy variables do have a contemporaneous effect on unemployment. Once we have recovered the structural shocks, we can then plot impulse response functions that capture the dynamic response of the unemployment rate to unanticipated changes in the measure of EPL.

The path of the unemployment rate in response to a shock to employment protection for permanent workers is shown by the impulse response function in Figure 2. The number of years after the shock is plotted on the horizontal axis and the magnitude of the response of unemployment is plotted on the vertical axis. The solid line plots the estimated response of unemployment and the dotted lines represent the 95% confidence interval calculated from bootstrap simulations of the model. As shown in Figure 2, a change in employment protection for permanent workers leads to a positive and statistically significant change in the unemployment rate for each of the five periods following the shock. In addition, the estimates imply that the unemployment rate continues to rise for five years after the policy change. The estimates imply that a one point increase in employment protection (e.g. an increase from 0 to 1 in the EPL statistic) would result in a

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located in Appendix A.

0.16 percentage point increase in the unemployment rate after five years.

To put this effect in the context of policy choice consider the comparison of the United States and Sweden. In the sample used in this paper, the average unemployment rate in Sweden was 6.97% whereas the average unemployment rate for the U.S. was 5.97%. The average value of the index of employment protection legislation for Sweden over the sample was 2.68 where the average value of the index was 0.26 for the U.S. Our estimates imply that the difference in employment protection legislation can explain 38.7% of the difference in unemployment between Sweden and the U.S.

Similar results are shown in Table 5 for the G7 countries. The second column in Table 5 lists the difference in the average unemployment rate over the sample period for the country listed and the United States. The last column of Table 5 shows the fraction of the difference in unemployment that can be explained by differences in employment protection legislation, given our estimates. As shown, five of the six remaining G7 countries had higher unemployment rates than the United States over the sample period. Our estimates suggest that the difference in the degree of employment protection can explain 8.4% to 17% of the difference in unemployment for these five countries, or 12.94% on average.

The path of the unemployment rate in response to a shock to employment protection for temporary workers is shown in Figure 3. The estimates in this figure assume that policy has no contemporaneous effect on unemployment. As shown, employment protection for temporary workers has a positive effect on the unemployment rate for each of the five periods after the shock. However, the change is not statistically significant.

Figures 4 and 5 plot the estimated path of the unemployment rate following a shock to employment protection for permanent and temporary workers, respectively, under the assumption that policy has a contemporaneous impact on unemployment. As shown in Figure 4, the initial effect is negative, but not statistically different from zero. Nevertheless, the effect of employment protection on the unemployment rate is positive and statistically different from zero beginning three years after the shock and the point estimates are of a similar magnitude as shown in Figure 2. This is also identical to the pattern found in our original simple panel estimates in which policy lags of 3 years or more showed a positive and statistically significant effect on unemployment. This also shows that the earlier results are robust to alternative causal ordering of the vector of endogenous variables since the effect of EPL on unemployment remains positive despite different assumptions about the contemporaneous effects. Figure 5, however, shows that the effect of employment protection for temporary workers on the unemployment rate is not statistically different from zero for any

period after the shock.

These results imply that EPL for permanent workers has a positive and statistically significant effect on unemployment. As hypothesized in the introduction, this effect tends to appear with a lag. Thus, policymakers and researchers should be concerned with the impact that EPL has on the unemployment rate far into the future, and should not just with the immediate impact of the legislation.

## 6 Conclusion

Employment protection legislation is used in a number of countries to specify the length and generosity of severance packages as well as the legally required amount of advanced notice and administrative costs associated with the termination of workers. For politicians these policies are appealing because they purport to reduce unemployment without a direct, explicit cost to the government. Our paper examines the impact of additional EPL on unemployment and tells a much different story. The initial effect of additional employee protection on unemployment is low or even negative. This may give policymakers the false impression that these policies can be enacted to protect workers from being fired without imposing additional costs on society. However, our results indicate that an increase in EPL does increase unemployment in the long run, and may not even be noticeable until after several years have passed. Presumably, this is because employers do not immediately fire workers after additional EPL is enacted, but close vacant positions opened up by workers who leave voluntarily. This finding potentially reconciles the two arguments in the literature that additional EPL does not immediately increase unemployment, but does reduce employment flows by making pools of unemployed more stagnant.

While the policy does not cost the state anything explicitly, the societal costs of maintaining a persistently larger population of unemployed are potentially quite large. Thus, the policy recommendation outlined by this paper is that OECD governments would be wise to lower the mandated costs associated with firing workers in order to permanently reduce the level of unemployment. In light of our findings, the efforts of nations in the EU to reduce EPL as part of their labor market reforms are likely to encourage labor market health in those countries over the next five years.

## Appendix A: PVAR Estimation Details

The Panel VAR is shown in equation (2) as

$$AY_{i,t} = B_0 + B_1Y_{i,t-1} + a_i + \varepsilon_{i,t}$$

Direct estimation of this equation is not possible for two reasons. First, the country-specific fixed effect,  $a_i$ , is correlated with the lagged dependent variables, so any estimated coefficients would be biased (but not inconsistent), as demonstrated by Nickell (1981). To eliminate this fixed effect from the regression, we use the Forward Orthogonal Difference (FOD) technique proposed by Arellano and Bover (1995), also commonly referred to as the Helmert transformation. This procedure transforms each of the variables into deviations from the means of all of the future instances of that variable. This removes the fixed effect, but does not produce a correlation between the transformed variables and the error term, and Nickell bias is no longer problematic.

Let the forward mean of any single variable in  $Y$  be given by

$$\bar{y}_{i,t} = \sum_{t+1}^T \frac{y_{i,t+1}}{(T-t)} \quad (3)$$

The transformed variables are then,

$$\tilde{y}_{i,t} = c_{i,t}(y_{i,t} - \bar{y}_{i,t}) \quad (4)$$

where  $c_{i,t} = \sqrt{(T-t)/(T-t+1)}$  is a constant included to equalize the variances.<sup>12</sup> Denote the vector of transformed variables as  $\tilde{Y}_{i,t}$ . The transformed structural VAR can be written as

$$A\tilde{Y}_{i,t} = B_0 + B_1\tilde{Y}_{i,t-1} + \tilde{\varepsilon}_{i,t} \quad (5)$$

Second, the model cannot be estimated in this form since it implies that all of the variables in  $Y_{it}$  have contemporaneous effects on the others. Thus, to estimate the equation above, we need to re-write the VAR as

$$\tilde{Y}_{i,t} = \Gamma_0 + \Gamma_1\tilde{Y}_{i,t-1} + e_{i,t} \quad (6)$$

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<sup>12</sup>For details, see Arellano and Bover (1995).

where  $\Gamma_0 = A^{-1}B_0$ ,  $\Gamma_1 = A^{-1}B_1$  and  $e_{i,t} = A^{-1}\tilde{\epsilon}_{i,t}$ .

It should be noted that (6) is a reduced form equation. It can be estimated by applying equation-by-equation OLS. The resulting  $e_{i,t}$ 's, however, are not orthogonal. To identify the structural shocks,  $\tilde{\epsilon}_{i,t}$ , we must make assumptions about the structural model in (5) by placing restrictions on the matrix  $A$ . As is common in analysis of multiple time series, we use a Choleski decomposition, which forces  $A$  to be lower triangular with zero entries below the principal diagonal. This amounts to assuming that the variable ordered first in  $\tilde{Y}$  is not contemporaneously affected by the variables ordered below it. The Choleski decomposition is popular with multiple time series analysis because it guarantees enough restrictions to just identify the structural shocks, so under or over-identification is not an issue. As is common in this literature, we provide a robustness check by re-ordering the variables in the VAR to show that the results are not sensitive to ordering of the variables.

Just identification through the Choleski decomposition ensures that we can recover the  $\tilde{\epsilon}_{i,t}$  from the data. This allows us to generate causal inference. Transforming (6) into the moving average representation and substituting for  $e_{i,t}$  yields

$$\tilde{Y}_{i,t} = \tilde{Y} + \sum_{j=0}^{\infty} \Gamma_1^j A^{-1} \tilde{\epsilon}_{i,t-j}, \quad (7)$$

The impulse response is therefore given as

$$\frac{\partial \tilde{Y}_{i,t}}{\partial \tilde{\epsilon}_{i,t-j}} = \Gamma_1^j A^{-1}$$

These impulse responses represent the marginal effect of a shock to  $\epsilon_{i,t-j}$  on the variables contained in  $\tilde{Y}_{i,t}$  at time  $t - j$ . By collecting and plotting the impulse responses for  $j = 0, 1, 2, \dots$  we can observe the dynamic response of a variable in  $\tilde{Y}_{i,t}$  to an orthogonal innovation in  $\tilde{\epsilon}_{i,t-j}$ .

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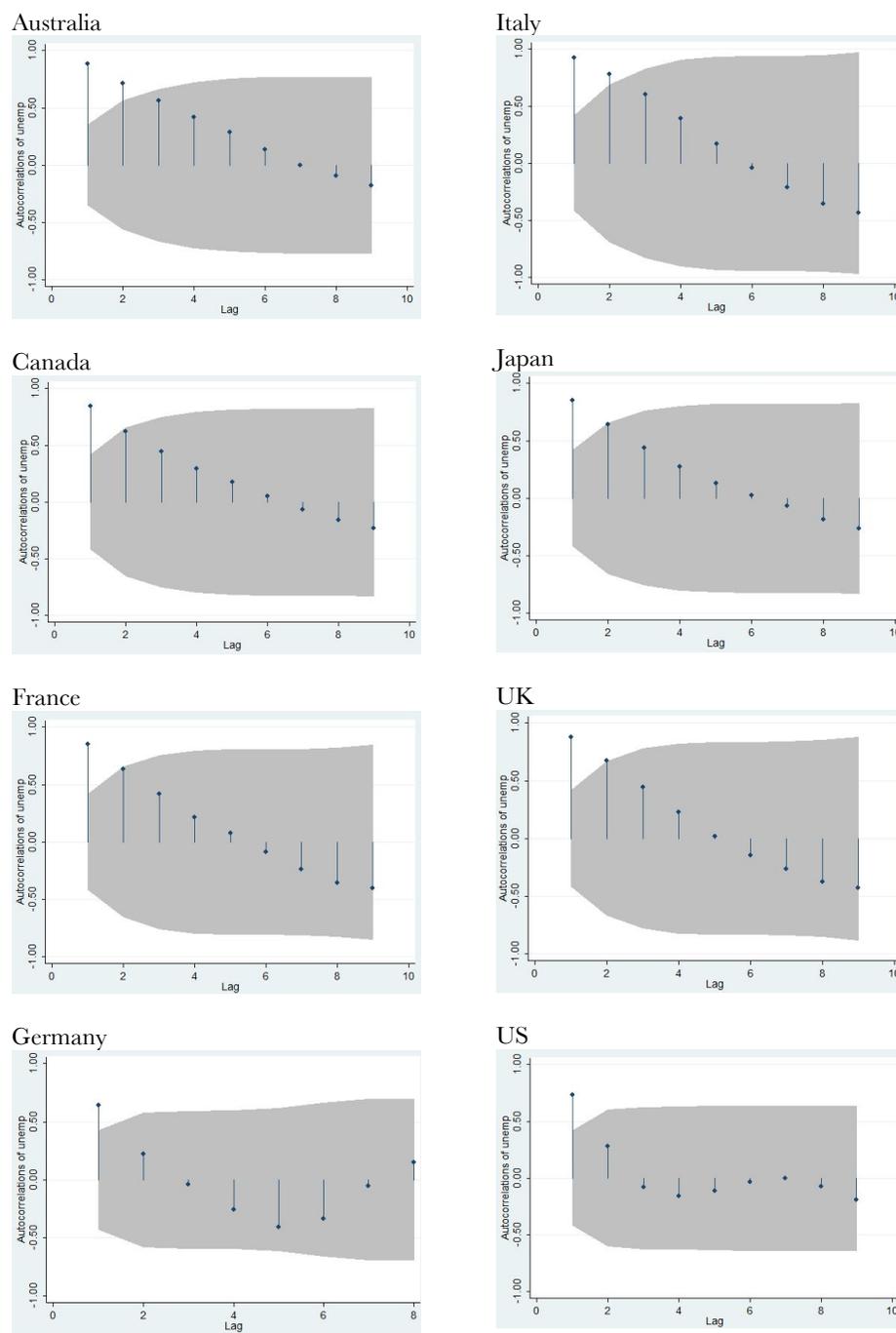


Figure 1: **Autocorrelation functions.** Autocorrelation functions for the unemployment rate in the G-7 countries and Australia.

Table 1: Time averages of unemployment and EPL protection indices by country

Country	Unemployment	Perm	Temp
Australia	6.96	1.35	0.88
Austria	4.07	2.58	1.31
Belgium	7.98	1.80	3.13
Canada	8.22	1.80	0.25
Chile	7.23	2.62	3.00
Czech Republic	6.23	3.21	0.82
Denmark	6.16	2.15	1.74
Estonia	8.81	2.12	2.06
Finland	9.85	2.31	1.46
France	9.99	2.38	3.60
Germany	8.32	2.74	1.94
Greece	9.89	2.74	1.94
Hungary	8.41	1.99	0.84
Iceland	3.90	1.73	0.625
Ireland	9.22	1.39	0.40
Israel	8.54	2.04	0.88
Italy	9.46	2.75	3.18
Japan	3.94	1.61	1.19
South Korea	3.46	2.59	2.50
Luxembourg	3.32	2.25	3.75
Mexico	3.80	2.19	3.92
Netherlands	4.71	2.89	1.10
New Zealand	6.45	1.40	0.71
Norway	4.12	2.33	3.01
Poland	13.51	2.23	1.15
Portugal	6.63	4.42	2.71
Slovakia	14.40	2.30	1.32
Slovenia	6.72	2.63	1.81
Spain	15.96	2.58	3.23
Sweden	6.97	2.68	1.65
Switzerland	3.47	1.60	1.13
Turkey	9.20	2.36	4.88
United Kingdom	6.78	1.12	0.31
United States	5.97	0.26	0.25
Countries	34		
Observations	651		

Time means and standard deviations for the unemployment and strictness of protection index measures for the 34 countries in the sample. Data covers 23 years from 1990 to 2012. Data for unemployment is collected from the World Bank's World Development Indicators. The strictness of protection measures are obtained from the OECD. The data comes after German reunification in 1990, so we do not need special treatment for Germany.

Table 2: Summary statistics for control variables

	Mean	Standard Deviation	Max	Min
Government expenditures as a percentage of GDP	19.20	4.16	26.89	10.79
Inflation	5.94	8.03	44.72	-0.52
Income per capita growth rate	1.71	1.00	5.05	0.47

Table 3: Simple panel fixed effects estimates for total unemployment

	Policy lag					
	$t = 0$	1	2	3	4	5
Perm	-1.087 (0.537)	0.752 (0.564)	2.173*** (0.590)	3.011*** (0.584)	3.312*** (0.600)	3.035*** (0.612)
Temp	-0.470*** (0.175)	-0.328 (0.178)	-0.201 (0.181)	0.003 (0.180)	0.006 (0.189)	0.064 (0.195)
$R^2$	0.152	0.193	0.190	0.186	0.192	0.206
$Prob > F$	0.000	0.000	0.000	0.000	0.000	0.000
AIC	2516.64	2390.24	2248.72	2106.76	1958.72	1836.41†
SBC	2636.12	2504.04	2356.78	2209.03	2055.24	1927.49†

The results from a simple panel fixed effects model of EPL on the unemployment rate. All regressions include both country and year fixed effects. The independent variable is the unemployment rate, *Perm* is the value of the strictness of employee protection index for permanent workers, and *Temp* is the value for temporary workers. The coefficients for the control variables are suppressed for brevity. The strictness of protection index is lagged between one and five years to show the long-run effects of policy.

\* - Estimate is significant at the 10% level; \*\* - Estimate is significant at the 5% level; \*\*\* - Estimate is significant at the 1% level; † - Indicates the best fit as implied by the Akaike Information Criterion (AIC) and the Schwarz-Bayes Information Criterion (SBC).

Table 4: Simple panel fixed effects estimates for long-term unemployment as a percentage of total unemployment

	Policy lag					
	$t = 0$	1	2	3	4	5
Perm	-2.830 (0.1.85)	-1.679 (1.927)	1.055 (1.971)	1.796 (1.940)	3.390* (1.889)	5.194*** (1.825)
Temp	0.075 (0.660)	0.0703 (0.610)	-0.022 (0.602)	0.213 (0.601)	0.104 (0.185)	1.495** (0.583)
$R^2$	0.022	0.007	0.020	0.051	0.102	0.128
$Prob > F$	0.000	0.000	0.000	0.000	0.000	0.000

The results from a simple panel fixed effects model of EPL on the long-term unemployment rate. All regressions include both country and year fixed effects. The independent variable is the unemployment rate, *Perm* is the value of the strictness of employee protection index for permanent workers, and *Temp* is the value for temporary workers. The coefficients for the control variables are suppressed for brevity. The strictness of protection index is lagged between one and five years to show the long-run effects of policy.

\* - Estimate is significant at the 10% level; \*\* - Estimate is significant at the 5% level; \*\*\* - Estimate is significant at the 1% level.

Table 5: Unemployment Differences and Employment Protection – G-7

Country	Difference in Avg. Unemployment	Fraction Explained by EPL
Canada	2.25	11.0%
France	4.02	8.5%
Germany	2.35	16.9%
Italy	3.49	11.4%
Japan	-2.03	–
United Kingdom	0.81	17.0%
Average		12.94%

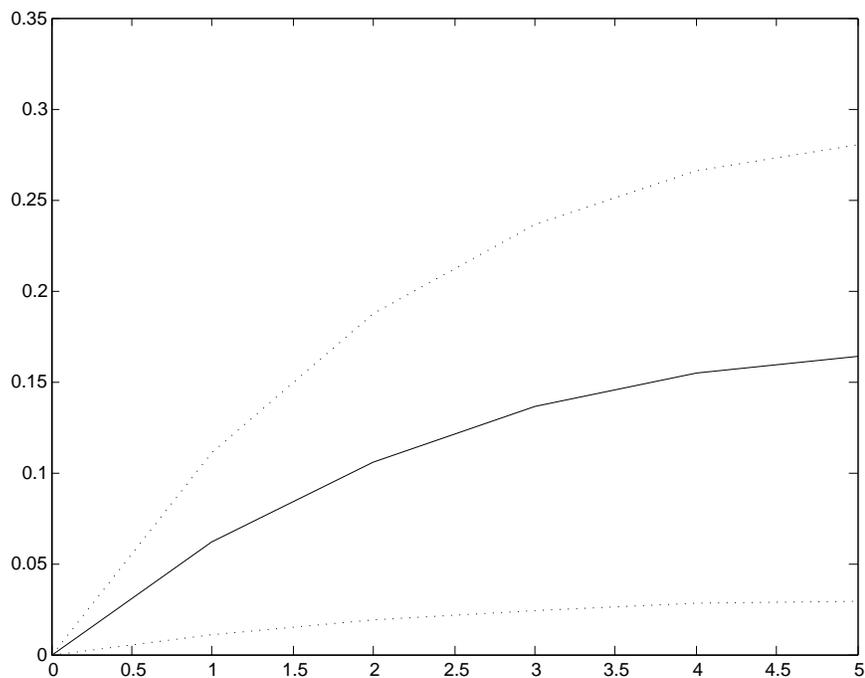


Figure 2: **Response of the Unemployment Rate to a One Unit Shock in Employment Protection for Permanent Workers (No Contemporaneous Policy Effects).** This figure shows the response of the unemployment rate (vertical axis) to an unanticipated increase in employment protection legislation of one point for permanent workers over time (horizontal axis) in years. This estimate assumes that changes in employment protection legislation have no contemporaneous effect on unemployment. The solid line shows the estimated response. The dotted lines represent the 95% confidence interval.

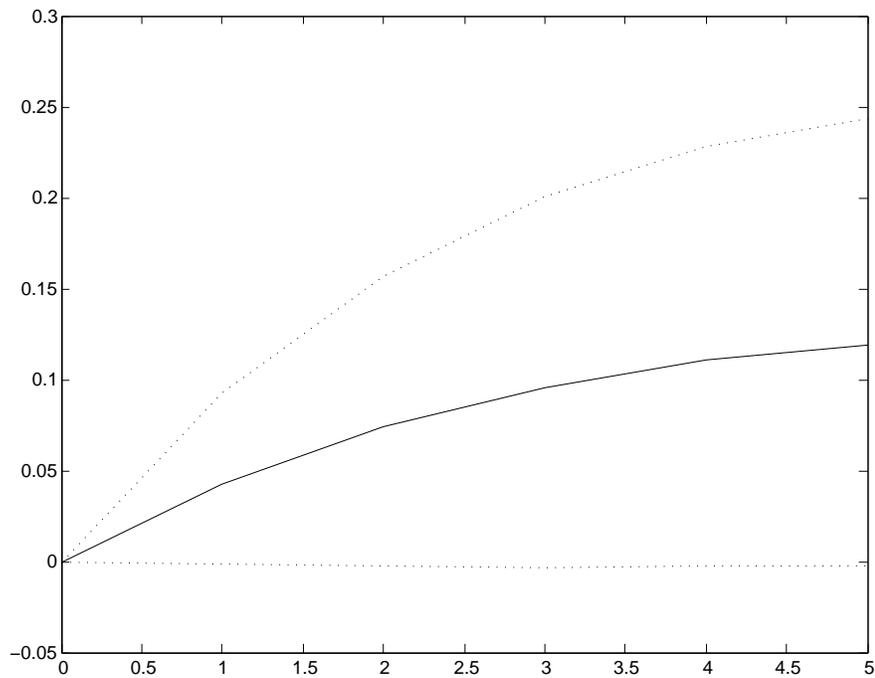


Figure 3: **Response of the Unemployment Rate to a One Unit Shock in Employment Protection for Temporary Workers (No Contemporaneous Policy Effects)**. This figure shows the response of the unemployment rate (vertical axis) to an unanticipated increase in employment protection legislation of one point for temporary workers over time (horizontal axis) in years. This estimate assumes that changes in employment protection legislation have no contemporaneous effect on unemployment. The solid line shows the estimated response. The dotted lines represent the 95% confidence interval.

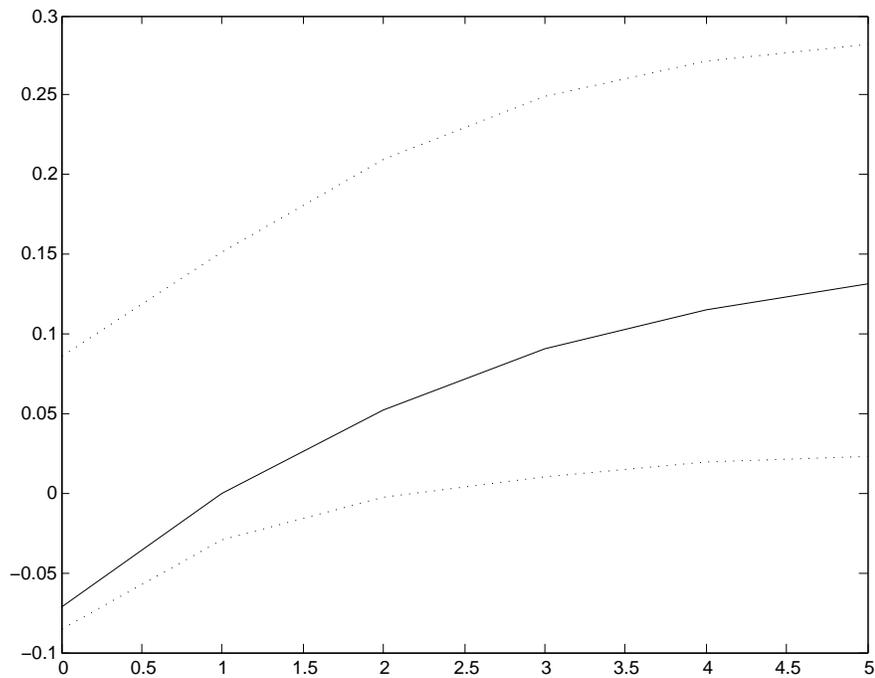


Figure 4: **Response of the Unemployment Rate to a One Unit Shock in Employment Protection for Permanent Workers (Contemporaneous Policy Effects)**. This figure shows the response of the unemployment rate (vertical axis) to an unanticipated increase in employment protection legislation of one point for permanent workers over time (horizontal axis) in years. This estimate assumes that changes in employment protection legislation has a contemporaneous effect on unemployment. The solid line shows the estimated response. The dotted lines represent the 95% confidence interval.

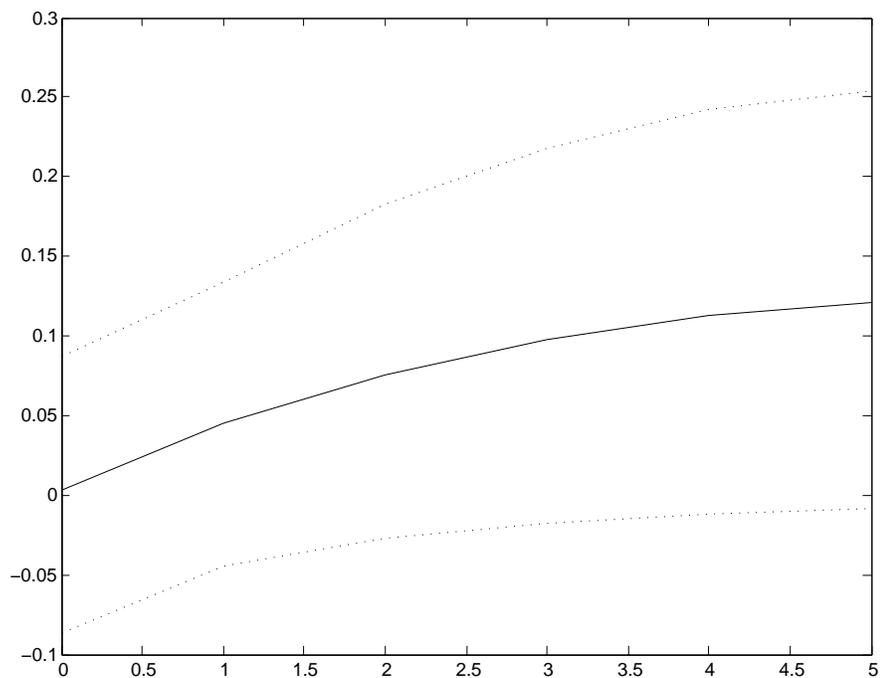


Figure 5: **Response of the Unemployment Rate to a One Unit Shock in Employment Protection for Temporary Workers (Contemporaneous Policy Effects)**. This figure shows the response of the unemployment rate (vertical axis) to an unanticipated increase in employment protection legislation of one point for temporary workers over time (horizontal axis) in years. This estimate assumes that changes in employment protection legislation has a contemporaneous effect on unemployment. The solid line shows the estimated response. The dotted lines represent the 95% confidence interval.

# Unemployment and Labor Market Rigidities: Europe versus North America

Stephen Nickell

**H**ere is the received wisdom. The European job market is rigid and inflexible. Result: high unemployment. The North American job market is dynamic and flexible. Result: low unemployment. So Europeans had better do something about their labor markets unless they want permanent double digit unemployment.

In fact, this is not *totally* wrong. There are features of the labor markets in some European countries that help sustain high levels of unemployment. Some of these features can be thought of as rigidities. However, there are many other so-called rigidities that do not cause high unemployment and, indeed, may serve a useful purpose. So it is important to know which features of the labor market cause high unemployment and which do not. This is the subject of what follows.

## Labor Market Outcomes in Europe and North America

While it is sometimes convenient to lump all the countries of western Europe together in order to provide a suitable contrast to North America, most of the time it is a rather silly thing to do. Different European countries are effectively different labor markets with the intercountry movement of labor being very small, mainly because of language and cultural barriers. Partly as a consequence of these differences, labor markets in Europe exhibit enormous diversity; in fact, differences within Europe are much greater than are the difference between the European average and North America. This section looks at some of these differences, first

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*Table 1*  
**Unemployment Rates in the OECD**

	1983–96	1983–88		1989–94			
	<i>Total</i>	<i>Total</i>	<i>Short-term</i>	<i>Long-term</i>	<i>Total</i>	<i>Short-term</i>	<i>Long-term</i>
Austria	3.8	3.6	na	na	3.7	na	na
Belgium	9.7	11.3	3.3	8.0	8.1	2.9	5.1
Denmark	9.9	9.0	6.0	3.0	10.8	7.9	3.0
Finland	9.1	5.1	4.0	1.0	10.5	8.9	1.7
France	10.4	9.8	5.4	4.4	10.4	6.5	3.9
Germany (W)	6.2	6.8	3.7	3.1	5.4	3.2	2.2
Ireland	15.1	16.1	6.9	9.2	14.8	5.4	9.4
Italy	7.6	6.9	3.1	3.8	8.2	2.9	5.3
Netherlands	8.4	10.5	5.0	5.5	7.0	3.5	3.5
Norway	4.2	2.7	2.5	0.2	5.5	4.3	1.2
Portugal	6.4	7.6	3.5	4.2	5.0	3.0	2.0
Spain	19.7	19.6	8.3	11.3	18.9	9.1	9.7
Sweden	4.3	2.6	2.3	0.3	4.4	4.0	0.4
Switzerland	1.8	0.8	0.7	0.1	2.3	1.8	0.5
U.K.	9.7	10.9	5.8	5.1	8.9	5.5	3.4
Canada	9.8	9.9	9.0	0.9	9.8	8.9	0.9
U.S.	6.5	7.1	6.4	0.7	6.2	5.6	0.6
Japan	2.6	2.7	2.2	0.5	2.3	1.9	0.4
Australia	8.7	8.4	5.9	2.4	9.0	6.2	2.7
New Zealand	6.8	4.9	4.3	0.6	8.9	6.6	2.3

*Source: OECD Employment Outlook, U.K. Employment Trends, U.S. Bureau of Labor Statistics.*

with regard to unemployment and then with regard to other labor market outcomes, notably job and worker mobility, and wage flexibility.

Table 1 sets out some information on unemployment<sup>1</sup> where we focus on the recent past, namely the period following the major recession of the early 1980s. The first column provides an up-to-date summary picture; the other columns present averages over two subperiods, which will be used for more detailed analysis. The immediate point that stands out is the enormous variation in European rates. Taking the period 1983–1996, these stretch from 1.8 percent in Switzerland to 19.7 percent in Spain. This variation means that around 30 percent of the popu-

<sup>1</sup> Table 1 uses OECD standardized rates, with the exception of Austria, Denmark and Italy. For Austria and Denmark, the table presents national registered rates. For Italy, the table presents the unemployment rate as calculated by the U.S. Bureau of Labor Statistics “on U.S. concepts.” Aside from Italy, the OECD rates and BLS rates are very similar. For Italy, the OECD rates appear to include the large number of Italians who are registered as unemployed but have performed no active job search in the previous four weeks. Finally, the unemployment rate here is for *West* Germany, both to maintain comparability across time and because including a “transition economy” in the data would weaken comparability across countries.

lation of OECD Europe lives in countries and operates in labor markets with average unemployment rates lower than that of the United States.

A closer look at Table 1 raises two additional points. First, the European countries with the lowest unemployment rates (Austria, West Germany, Norway, Portugal, Sweden and Switzerland) are not noted for the flexibility of their labor markets. Britain, on the other hand, has always had the most flexible labor market in Europe on standard measures and yet has an average unemployment rate higher than half of its European neighbors.

Second, it is worth remarking on the fact that the variation in short-term unemployment is substantially smaller than that in long-term unemployment, where long-term is defined as a duration of more than a year. Thus, while countries require some short-term unemployment, long-term unemployment appears to be an optional extra. The reason is that long-term unemployment, in contrast to the short-term variety, contributes very little to holding down wage pressure and hence inflation (OECD, 1993, p. 94). The long-term unemployed are far enough away from the active labor market that their presence has little influence on wages. So if some suitable microeconomic policy can eliminate long-term unemployment, this will have few adverse macroeconomic implications. That is, it will not require much of a rise in short-term unemployment to maintain stable inflation.

Instead of concentrating on unemployment rates, some commentators prefer to focus on total employment, noting, for example, that North American employment has risen much faster in recent years than has European employment. Such a contrast is not helpful, however, because there is no control for different rates of growth in the population of working age. Controlling for this by normalizing on the size of the labor force takes one back to unemployment. A more reasonable alternative is to focus on employment/population ratios, although these tend to be strongly influenced by all the social and cultural factors that affect the labor market participation of married women. Table 2 presents evidence on alternative labor supply measures, like the employment/population ratio.

The first two columns of Table 2 show the ratio of employed persons to the total working-age population and the ratio for males ages 25–54. The cross-country variation in overall employment/population ratios is due to a variety of factors. Particularly important are variations in the participation rates of married women (which are very low in southern Europe), variations in the retirement rates of those over the age of 55 (OECD, 1996, p. 188) and variations in the employment rates of prime-age men, shown in the second column of the table. The third column of the table shows annual hours worked by the average worker in these different economies. Differences in this column are dominated by the extent of part-time working and by variations in weekly hours and annual holiday entitlements. Many countries in continental Europe have low annual hours actually worked even excluding part-time workers, because of their low weekly hours and long annual holidays compared to those of the United States and Japan. This does not imply that European workers would like to work more paid hours per year. Indeed, across the EC, more people would like to work *fewer* paid hours than would like to work more paid hours at

Table 2  
**Alternative Labor Supply Measures**

	<i>Employment/Population Ratio (%) (whole working age population)</i>	<i>Employment/Population Ratio (%) (males age 25–54)</i>	<i>Annual Hours Worked per Worker</i>	<i>Overall Labor Supply (%)</i>
Austria	67.3	86.6	1600	51.6
Belgium	56.1	87.4	1580	42.6
Denmark	75.0	86.6	1510	54.5
Finland	67.1	82.4	1770	57.1
France	59.8	87.9	1650	47.4
Germany (W)	65.2	87.0	1600	50.0
Ireland	53.2	80.3	1750	44.8
Italy	54.0	84.3	1730	44.9
Netherlands	62.2	86.5	1510	45.2
Norway	73.3	87.4	1430	50.4
Portugal	69.3	90.6	2000	66.6
Spain	47.5	81.5	1820	41.6
Sweden	75.6	88.2	1510	52.0
Switzerland	78.6	94.7	1640	62.0
UK	69.6	86.7	1750	58.6
Canada	70.6	84.7	1740	59.0
U.S.	73.1	88.2	1940	68.2
Japan	73.4	95.9	1960	69.2
Australia	68.2	86.5	1870	61.3
New Zealand	68.0	86.6	1830	59.8

Source: *OECD Employment Outlook* (1996), Tables A, B and C.

given hourly rates (European Economy, 1995, Table 25a). The final column, “overall labor supply,” combines the annual hours worked and employment/population ratios. Take the annual hours worked as a percentage of 2080 hours, which represents a full-time year of working 40 hours a week for 52 weeks. Multiply this by the employment/population ratio. The result can be thought of as the proportion of total “potential” hours worked in the economy. Total labor supply varies enormously across countries, with Japan, Portugal and the United States all supplying about two-thirds of potential hours, while Spain and Belgium supply barely 40 percent of potential.<sup>2</sup>

Another way of putting the unemployment/rigidity story into a broader perspective is to look at job and worker mobility. Job turnover is defined as the sum of the gross job creation and job destruction rates across companies; that is, the total of all new jobs generated plus all old jobs destroyed. Worker mobility includes

<sup>2</sup> Of course, these numbers exclude unmeasured labor input into, for example, the “black economy.” However, these total labor supply numbers are worth bearing in mind when comparing GDP per capita across countries.

all job turnover, but also includes the numerous occasions where workers enter or leave a job in a company when the overall number of jobs remains fixed, because of quits, retirements and so on. Of course, there are problems of comparability with cross-national data such as these (Contini et al., 1995), but there is no evidence that jobs are created and destroyed at a more rapid rate in North America than they are in Europe. However, workers do appear to circulate faster through the existing jobs in North America (OECD, 1996, Tables 5.1, 5.2). This is also consistent with the finding that the United States has relatively high levels of regional mobility: about 3 percent of U.S. households change their region of residence in a year, compared to closer to 1 percent in the United Kingdom, Germany and France, and even lower in Italy and Spain. However, regional mobility rates in Norway and Sweden are similar to those in the United States (OECD, 1990, Table 3.3). Since the encouragement of regional mobility has always been a feature of Norwegian and Swedish labor market policy, this outcome is no surprise.<sup>3</sup>

A final perspective on the aggregate labor market is to look at the evidence on wage flexibility. Table 3 presents some measures of the responsiveness of overall wages to unemployment, derived from both aggregate time series and individual survey data. Of course, this is only one feature of wage flexibility; for example, it is not informative about the flexibility of relative wages across different groups. However, for this particular aspect of wage flexibility, there is no dramatic contrast between Europe and North America. If anything, Canada and the United States veer toward the inflexible end of the spectrum.

To summarize, the contrast between Europe and North America is more complex than is commonly realized. Unemployment is higher in the majority of European countries than in the United States, but there is considerable variation across Europe. Rates of job turnover are no higher in North America than in Europe and neither are overall wages any more flexible, but it does seem that U.S. workers are more mobile than are many Europeans both geographically and between jobs. The next step is to focus on a large number of separate features of the labor market and to try to isolate those that have some responsibility for the high levels of unemployment in many European countries.

### **What Features of the Labor Market Generate High Unemployment?**

Our aim in this section is to pinpoint precisely which features of the labor market generate unemployment and which do not. Then we can discuss how these facts relate to the view that high unemployment in Europe is due to rigid and inflexible labor markets.

The first step is to look at labor market characteristics in different countries. Table 4 presents direct measures of labor market rigidities and summary statistics

<sup>3</sup> The “regions” in all these countries are comparable in size, so these comparisons have some meaning.

Table 3

**Wage Flexibility: The Percentage Increase in Wages in Response to a One Percentage Point Fall in the Unemployment Rate**

	<i>Aggregate Time Series Measure</i>		<i>Microeconomic Measure</i>
	<i>Short-run</i>	<i>Long-run</i>	
Austria	1.43	3.11	2.43
Belgium	0.65	4.06	
Denmark	0.66	1.74	
Finland	0.48	1.55	
France	2.22	4.35	
Germany (W)	0.55	1.01	2.06
Ireland	0.80	1.82	2.35
Italy	2.07	12.94	1.32
Netherlands	0.66	2.28	1.98
Norway	1.96	10.59	1.95
Spain	0.17	1.21	
Sweden	2.31	12.16	
Switzerland	1.32	7.33	7.06
U.K.	0.98	0.98	0.82
Canada	0.50	2.38	0.92
U.S.	0.32	0.94	1.52

*Source:* Aggregate time series measures; Layard et al. (1991), chapter 9, Table 2. Microeconomic measures; Blanchflower and Oswald (1994), Table 9.1. These later numbers are derived by dividing the Blanchflower/Oswald numbers by the average unemployment rate, because they only report the elasticity of wages with respect to unemployment.

on the treatment of the unemployed. The employment protection index in the first column was drawn up by the OECD and is based on the strength of the legal framework governing hiring and firing. The countries are ranked from 1–20, with 20 being the most strictly regulated. The countries of southern Europe have the toughest regulations and, roughly speaking, these regulations get weaker as one moves further north. Switzerland, Denmark and the United Kingdom have the weakest laws in Europe, and these laws are comparable to those in place outside Europe.

The labor standards index in the second column was also drawn up by the OECD and refers to the strength of the legislation governing a number of aspects of the labor market. The index ranges from 0 to 10, with each country being scored from 0 (lax or no legislation) to 2 (strict legislation) on each of the five dimensions: working time, fixed-term contracts, employment protection, minimum wages and employees' representation rights (on works councils, company boards and the like). The scores are then added up. The picture is similar to the employment protection column. The United Kingdom and the United States have very weak legislation in this area, whereas Spain and Italy have many strict rules and regulations. So it is undoubtedly true that if we are to think of inflexibility as referring to legal restric-

Table 4  
Features of OECD Labor Markets I, 1989–1994

	Direct Rigidities		Treatment of the Unemployed		
	1 Employment Protection	2 Labor Standards	3 Benefit Replacement Rate (%)	4 Benefit Duration (years)	5 Active Labor Market Policies
Austria	16	5	50	2	8.3
Belgium	17	4	60	4	14.6
Denmark	5	2	90	2.5	10.3
Finland	10	5	63	2	16.4
France	14	6	57	3	8.8
Germany (W)	15	6	63	4	25.7
Ireland	12	4	37	4	9.1
Italy	20	7	20	0.5	10.3
Netherlands	9	5	70	2	6.9
Norway	11	5	65	1.5	14.7
Portugal	18	4	65	0.8	18.8
Spain	19	7	70	3.5	4.7
Sweden	13	7	80	1.2	59.3
Switzerland	6	3	70	1	8.2
U.K.	7	0	38	4	6.4
Canada	3	2	59	1	5.9
U.S.	1	0	50	0.5	3.0
Japan	8	1	60	0.5	4.3
Australia	4	3	36	4	3.2
New Zealand	2	3	30	4	6.8

Source: OECD *Jobs Study* (1994), Part II, Table 6.7, column 5. OECD *Employment Outlook* (1994), Table 4.8, column 6 (extended by author). U.S. Department of Health and Social Services, *Social Security Programmes Throughout the World* (1993). OECD *Employment Outlook* (1995), Table T.

tions on the operation of the labor market, southern and continental Europe are the most inflexible. As an offset to this, however, it is worth remarking that southern Europe also has the highest rate of self-employment in the OECD (OECD, 1994, Table 6.8). The self-employed are, presumably, among the most flexible of all workers.

Benefit systems vary quite dramatically. The “replacement rate,” which shows what share of income is replaced by unemployment benefits, and the duration of these benefits (four years means indefinite duration) are typically fairly generous by U.S. standards (50 percent replacement rate for six months). Italy, however, barely had an unemployment benefit system at all for most of the postwar period.<sup>4</sup>

<sup>4</sup> Until recently, the unemployed in Italy were entitled to 800 lira per day (around 50 cents). A small proportion of the “unemployed” would be covered by the CIG scheme for industrial workers who are in danger of being laid off. These typically do not amount to more than 1 percentage point of unemployment.

Some of the countries with the most generous benefit levels have strictly time-limited systems, notably in Scandinavia, like Sweden's 80 percent replacement rate, which is limited to 1.2 years. The next column, "active labor market policies," refers to expenditures on activities for the unemployed that are geared to help them back into work and are popular in many, although not all, European countries. These include labor market training, assistance with job search, subsidized employment and special measures for the disabled. The numbers in this column are derived by taking active labor market spending per unemployed person as a percentage of GDP per member of the labor force. Thus, Sweden's figure of close to 60 shows that expenditure on active policies per unemployed person is nearly 60 percent of national output per potential worker, which is extraordinarily high. Spain, on the other hand, is notable for its combination of a generous benefit system and a low level of expenditure on active labor market policies.

The first few columns of Table 5 present variables that summarize the structure of wage determination systems. In most European countries, with the exception of the United Kingdom and Switzerland, trade unions play a very significant role in wage determination. The union density column shows the proportion of trade union members as a percentage of all wage and salary earners. However, this does not tell the whole story. In many nations, union wage negotiations determine the wages of workers who are not explicitly part of the union. In Spain and France, for example, only about 10 percent of workers are union members, but the wages of over 70 percent of all workers are covered by union bargaining. Thus, the "union coverage index" presents a summary of the share of workers actually covered by union bargaining, where 3 means over 70 percent covered, 2 means from 25–70 percent, and 1 is under 25 percent.

The next column of the table shows the extent of coordination in wage bargaining, on the part of both unions and employers. In each country, the degree of union and then employer coordination is ranked from a low of 1 to a high of 3. In some of these countries, both unions and, more significantly, employers coordinate their wage bargaining activities, particularly in central Europe and Scandinavia. In those countries where unions play a lesser role, although still an important one—like the United Kingdom, Switzerland, and all non-European countries except the United States—there is very little coordination over wage bargaining, with the notable exceptions of Switzerland and Japan, where employer coordination is very important.

The final two columns of the table give information on the tax burden on labor. First we have the payroll tax rate, defined as the ratio of labor costs to wages (less unity) and then we show the total tax rate, which is the sum of the average payroll, income and consumption tax rates. The latter are based on aggregate tax and income data. The payroll tax rate varies dramatically across countries, with Denmark levying no payroll taxes and France and Italy with a rate close to 40 percent. The total tax rate is less variable and represents a crude measure of the tax wedge between real labor costs and real take-home pay. This is arguably the correct measure of the tax burden on labor.

Table 5  
Features of OECD Labor Markets II, 1989–1994

	1 Union Density (%)	2 Union Coverage Index	3 Co-ordination		4 Payroll Tax Rate (%)	5 Total Tax Rate (%)
			Union	Employer		
Austria	46.2	3	3	3	22.6	53.7
Belgium	51.2	3	2	2	21.5	49.8
Denmark	71.4	3	3	3	0.6	46.3
Finland	72.0	3	2	3	25.5	65.9
France	9.8	3	2	2	38.8	63.8
Germany (W)	32.9	3	2	3	23.0	53.0
Ireland	49.7	3	1	1	7.1	34.3
Italy	38.8	3	2	2	40.2	62.9
Netherlands	25.5	3	2	2	27.5	56.5
Norway	56.0	3	3	3	17.5	48.6
Portugal	31.8	3	2	2	14.5	37.6
Spain	11.0	3	2	1	33.2	54.2
Sweden	82.5	3	3	3	37.8	70.7
Switzerland	26.6	2	1	3	14.5	38.6
U.K.	39.1	2	1	1	13.8	40.8
Canada	35.8	2	1	1	13.0	42.7
U.S.	15.6	1	1	1	20.9	43.8
Japan	25.4	2	2	2	16.5	36.3
Australia	40.4	3	2	1	2.5	28.7
New Zealand	44.8	2	1	1	—	34.8

Source: Layard et al. (1991), Annex 1.4, and *OECD Employment Outlook* (1994), p. 175–85. Centre for Economic Performance (LSE), OECD data set.

Overall, therefore, there are quite substantial differences between European and North American labor markets as well as important differences within Europe. The consequences of these differences for unemployment and labor supply form our next topic.

## The Labor Market and Unemployment

Our purpose in what follows is to investigate the relations between unemployment and other measures of labor supply, and labor market institutions. Table 6 presents three regressions relating to unemployment. Each regression is based on two cross-sections dated 1983–88 and 1989–1994. The dependent variables are the unemployment rates reported in Table 1, and the values of the independent variables for the time period 1989–1994 are from Tables 4 and 5. The corresponding values of the independent variables for 1983–88 are not presented here but are available from the author. Some variables take the same values for both periods,

**Table 6**  
**Regressions to Explain Log Unemployment Rate Percentage**  
*(20 OECD countries, 1983–88 and 1989–1994)*

	1 <i>Total Unemployment</i>	2 <i>Long-term Unemployment</i>	3 <i>Short-term Unemployment</i>
Employment Protection (1–20)	–0.0032 (0.03)	0.051 (0.034)	–0.046 (0.024)
Replacement Rate (%)	0.011 (0.0050)	0.011 (0.0080)	0.011 (0.0060)
Benefit Duration (years)	0.088 (0.055)	0.25 (0.089)	0.043 (0.062)
Active Labor Market Policies <sup>a</sup>	–0.024 (0.0087)	–0.039 (0.013)	–0.012 (0.0098)
Union Density (%)	0.012 (0.0063)	0.010 (0.0096)	0.0082 (0.0071)
Union Coverage Index (1–3)	0.45 (0.22)	0.83 (0.35)	0.39 (0.24)
Co-ordination (Union + Employer) (2–6)	–0.46 (0.087)	–0.54 (0.15)	–0.37 (0.11)
Total Tax Rate (%)	0.026 (0.0087)	0.023 (0.013)	0.025 (0.010)
Change in Inflation (% pts. p.a.)	–0.17 (0.11)	–0.30 (0.17)	–0.18 (0.10)
Dummy for 1989–94	0.20 (0.095)	0.30 (0.16)	0.17 (0.089)
<i>R</i> <sup>2</sup>	0.76	0.84	0.60
<i>N</i> (countries, time)	40 (20, 2)	38 (19, 2)	38 (19, 2)

*Notes:* Estimation is by GLS random effects using two time periods (1983–88 and 1989–1994). Standard errors are in parentheses.

<sup>a</sup> The variable is instrumented. Because the active labor market policies variable refers to percentage of GDP normalized on *current* unemployment, this variable is highly endogenous. So we renormalized the current percentage of GDP spent on active labor market measures on the average unemployment rate in 1977–79 to create the instrument. Insofar as measurement errors in unemployment are serially uncorrelated, this will help with the endogeneity problem.

but many are different. We chose to use six-year averages in order to smooth out both the cycle and year-on-year noise. On the other hand, we felt there was enough useful information here to warrant the use of two cross-sections rather than one 12-year average. The regression coefficients are estimated using the standard random effects generalized least squares procedure, which is essentially ordinary least squares corrected for the fact that the two successive observations for each country cannot be treated as independent random draws. Finally, note that the dependent variables are the logs<sup>5</sup> of the unemployment rate (column 1), the long-term rate (column 2) and the short-term rate (column 3). Thus, if the right-hand side of the equation increases by 0.1, log unemployment goes up by 0.1, so unemployment rises by just over 10 percent. From a baseline unemployment rate of 5 percent, this would represent an increase of half a percentage point to 5.5 percent.

In Table 7 we report similar regressions explaining other aspects of labor supply, notably the employment/population ratios and overall labor supply reported

<sup>5</sup> The use of the log of the unemployment rate follows from the fact that many investigations of wage determination find that the use of  $\log u$  in a wage equation is preferable to the use of  $u$ . See Blanchflower and Oswald (1994), for example.

*Table 7*  
**Regressions to Explain Labor Supply Measures**  
*(20 OECD countries, 1983 and 1989–1994)*

	<i>Employment/Population Ratio (%)</i>		
	<i>1</i> <i>Whole Working</i> <i>Age Population</i>	<i>2</i> <i>Males Aged</i> <i>25–54</i>	<i>3</i> <i>Overall Labor</i> <i>Supply</i>
Employment Protection (1–20)	–0.94 (0.30)	0.040 (0.18)	–0.70 (0.39)
Replacement Rate (%)	–0.026 (0.072)	–0.052 (0.043)	–0.037 (0.091)
Benefit Duration (years)	–1.26 (0.63)	–0.61 (0.43)	–0.32 (0.73)
<sup>a</sup> Active Labour Market Policies	0.16 (0.11)	0.081 (0.073)	–0.028 (0.14)
Union Density (%)	–0.082 (0.086)	–0.11 (0.053)	–0.18 (0.11)
Union Coverage Index (1–3)	–0.96 (2.54)	–1.36 (1.74)	–2.24 (2.84)
Coordination (Union + Employer) (2–6)	5.03 (1.23)	2.71 (0.74)	4.20 (1.58)
Total Tax Rate (%)	–0.24 (0.12)	–0.16 (0.075)	–0.26 (0.16)
Change in Inflation (% pts. p.a.)	–2.12 (0.93)	–0.97 (0.72)	–2.02 (0.97)
Dummy for 1989–94	1.87 (0.79)	–2.09 (0.63)	0.041 (0.83)
<i>R</i> <sup>2</sup>	0.81	0.63	0.51
<i>N</i> (countries, time)	(20, 2)	(20, 2)	(20, 2)

*Notes:* Estimation is by GLS random effects using two time periods (1983, 1989–1994). Standard errors are in parentheses.

<sup>a</sup> Active labor market prices are instrumented as in Table 6.

in Table 2. Again we use two cross-sections with the same independent variables. In this case, the dependent variables are not in logs.

Before we go on to discuss particular rigidities, it is worth commenting briefly on the status of these results. First, we see them as a helpful overview of the correlations in the data and nothing more. Like all simple cross-section correlations, care must be taken with their interpretation because of issues of reverse causality and the like. Second, despite the use of six-year averages, there may still be significant long-term variations across countries in the stance of macroeconomic policy. We control for the average change in inflation as one attempt to deal with this problem. Third, there may be factors that explain cross-country differences in unemployment that are not associated with the labor market. For example, it can be argued that higher levels of product market competition tend to reduce unemployment (Layard, Nickell and Jackman, 1991, chapters 7 and 9, for example). Unfortunately, it has not proved possible to obtain measures of product market competition that are consistent across enough countries to include in the regressions.

Finally, and most importantly, why focus only on the 1980s and 1990s? Underlying this question is the reasonable argument that in the 1960s, the unemployment rankings across countries were completely different but, roughly speaking, the labor market institutions were the same. So how can the labor market institutions have

anything to do with unemployment? Part of the answer has to be that the institutions had a big impact on the way in which each of the economies of the different countries responded to the major adverse shocks of the 1970s *and* the way in which some of these responses, notably unemployment, persisted through the 1980s and 1990s. In part, this effect is what our regressions are picking up. There remain a number of unanswered questions concerning the evolution of labor markets since the 1960s. Here, our main concern is much more limited, namely the question of which institutions, for whatever reason, appear to be important in understanding recent unemployment levels across the OECD. So let us consider various institutions in turn.

### **Direct Rigidities**

Labor market legislation is typically put in place to protect employees from arbitrary, unfair or discriminatory actions on the part of employers. In so doing, it may raise the effective cost to firms of employing workers and/or raise the effective cost of adjusting levels of employment. The impact of the former on unemployment depends crucially on the extent to which the extra costs are shifted onto employees by a suitable adjustment of the wage. The general evidence on payroll taxes (as we shall see) is that the major part of the burden of such costs is typically shifted onto workers in the long run, thereby nullifying their impact on unemployment. While this obviously cannot be the case for minimum wages, there is no evidence in our data that high labor standards overall have any impact on unemployment whatever. For example, if we add our labor standards variable (Table 4, column 1) to our unemployment regression (Table 6, column 1), it has a negligible and completely insignificant coefficient.<sup>6</sup>

Laws that raise the cost of employment adjustment, notably those relating to employment protection, will tend to reduce the inflow into unemployment and, because they make firms more cautious about hiring, will also reduce the flow out of unemployment into work. This will almost certainly reduce short-term unemployment (via the reduced inflow) and raise long-term unemployment (via the reduced outflow). The overall impact on unemployment is likely to be rather small, as these effects would tend to cancel out. The results in the first row of Table 6 are entirely consistent with this discussion and confirm the analysis of Bentolila and Bertola (1990).

However, as the coefficients in the first row of Table 7, columns 1 and 3, indicate, there is some evidence of a negative correlation between employment protection and measures of labor supply that go beyond unemployment (see also Lazaar, 1990). Much of this correlation arises, in fact, because participation rates among married women in southern Europe are very low and employment protection laws in these countries are very tough (OECD, 1994, Table 6.9). Thus, as the first row of Table 7 also indicates, if we focus on prime-age men (column 2), there

<sup>6</sup> The coefficient is 0.019 with a standard error of 0.063.

is no effect. A speculative hypothesis might be that low female participation and tough employment protection laws in southern Europe are both consequences of a culture that places a great deal of weight on the position of the (male) head of household, which is not to be undermined either by the presence of a high-earning wife or by the loss of a job.

### **The Treatment of the Unemployed**

There are two aspects of the treatment of unemployed individuals, which might be termed passive and active. The passive is exemplified by the payment, as of right, of unemployment benefit for a given period. Active policies, on the other hand, consist of measures that attempt to ensure that the unemployed individual is able and willing to take up work.

On the passive side, generous benefit systems influence unemployment via two mechanisms. First, they reduce the fear of unemployment and hence directly increase upward pressure on wages from employees (via unions, for example). Second, they reduce the “effectiveness” of unemployed individuals as potential fillers of vacancies, by allowing them to be more choosy. The impact of a high benefit replacement ratio on unemployment is well documented (Layard, Nickell and Jackman, 1991; OECD, 1994, chapter 8) and is confirmed by the significant coefficient on the replacement rate in Table 6. The other important feature of the benefit system is the duration of entitlement. Long-term benefits generate long-term unemployment (Table 6, row 3; OECD, 1991, Chart 7.1B). Of course, it can be argued that countries might introduce more generous benefit systems when unemployment is a serious problem, so that in cross-country correlations, the causality runs from unemployment to benefits rather than the other way round. However, the microeconomic evidence on the positive impact of benefit levels and entitlement durations on the duration of individual unemployment spells (Narendranathan, Nickell and Stern, 1985; Meyer, 1990) suggests that at least part of the observed cross-country correlation can be taken at face value.

The impact of a relatively generous benefit system might be offset by suitable active measures to push the unemployed back to work. Such policies seem to work particularly well when allied to a relatively short duration of benefit entitlement, reducing long-term unemployment while alleviating the social distress that might be caused by simply discontinuing benefits without offering active assistance toward a job. Their effects are well summarized in OECD (1993, ch. 2), and their significant impact in reducing long-term unemployment is illustrated in the fourth row of Table 6.

While benefits affect unemployment, our evidence suggests that the benefit system seems to have little impact on overall labor supply as shown in Table 7. There is a suggestion here that while high benefits lead to high unemployment, they also lead to high participation because they make participation in the labor market more attractive, because participation is necessary to be eligible for the high benefits. This is consistent with a weak impact of benefits on employment/popu-

lation ratios, because the higher unemployment effect and the higher labor market participation effect tend to cancel out.

### **Wage Determination and Unions**

The key features of wage determination systems are the extent to which wages are determined collectively, via union bargaining (union coverage), and the degree to which employers and unions coordinate their wage bargaining activities given that wages are determined collectively. Of course, if wages are not generally determined collectively, as in the United States, the extent of coordination simply does not apply.

Unions tend to raise pay, and thus one would expect the extent of union activity in an economy to influence unemployment. This is confirmed by the results in rows 5 and 6 of Table 6, where greater union density and especially union coverage tend to raise unemployment. However, Table 6, row 7, also shows that this is offset if unions and employers can coordinate their bargaining activities. For example, leapfrogging is a common feature of decentralized, uncoordinated, union-dominated systems; that is, each union tends to take an earlier pay settlement in a related sector as a baseline to be exceeded in its own negotiations. This generates an additional source of inflationary pressure that requires more unemployment to quash it. If unions and employers can coordinate their wage bargaining activities, such leapfrogging may be eliminated.

It is important to note that coordination does not mean centralization, which typically implies government involvement in wage bargaining. Both Japan and Germany have a high degree of coordination in wage bargaining, particularly across employers, but neither system is centralized. And as OECD (1994, Table 5.16) makes clear, coordination appears to have a significant negative impact on wages, whereas the centralization of wage bargaining does not. To summarize, therefore, unions are bad for jobs, but these bad effects can be nullified if both the unions and the employers can coordinate their wage bargaining activities.

### **Labor Taxes**

Lowering payroll taxes is a very popular recommendation by those concerned with reducing unemployment (OECD, 1994; Phelps, 1994). It is easy to understand this advice if a payroll tax is viewed as a tax on jobs. Things are not, however, quite as they seem. The first point to recognize is that, broadly speaking, the key tax rate for the labor market is the sum of the payroll tax rate, the personal income tax rate and the consumption tax rate. Switching between these taxes will not have an important impact, so payroll taxes, per se, are of little consequence. This result has nothing to do with the incidence of these taxes, which we shall address later. It derives from the logic of supply and demand.

Consider a simple example. Suppose we have a labor market where total labor costs per employee are \$100, payroll taxes paid by the employer are \$10 (so pretax wages are \$90), income taxes paid by the employee are \$10, and post-tax wages are \$80. Suppose this labor market is in equilibrium. Thus, firms are just willing to

employ at \$100 all the workers who are willing to work at \$80. Now suppose that income taxes are reduced to \$5 and payroll taxes are raised to \$15 to maintain revenue. Further, suppose that as a result of this change, firms pay pretax wages of \$85. Then labor costs per employee are \$100; post-tax wages are \$80. This remains an equilibrium because firms are still willing to employ at \$100 all the workers who want to work at \$80. Nothing substantive has changed except that pretax wages have fallen from \$90 to \$85. But this is irrelevant; the only prices that interest the agents in this economy are labor costs per employee and post-tax wages.

But what about consumption taxes? Employees are interested in what their wages can buy. So if their income taxes are cut by 10 percent and the cost of consumption is raised by 10 percent, post-tax real wages are unchanged and so is labor market behavior. So, broadly speaking, what really counts is the sum of payroll taxes, income taxes and consumption taxes; the total tax burden on labor. Of course, this is not exactly correct for a variety of reasons. For example, income tax is charged on nonlabor income whereas payroll tax is not, so that a cut in payroll tax and a rise in income tax will reduce nonlabor income, raise labor supply and reduce unemployment. But, in practice, this is not important because individuals who are likely to become unemployed have little or no nonlabor income.<sup>7</sup> Our conclusion is that payroll taxes, *per se*, can be expected to have little impact on unemployment but the total tax burden might.

The fundamental question, therefore, is whether or not this total tax burden is entirely shifted onto labor. That is, does real labor cost per worker remain unaffected by variations in the total tax burden, at least in the long run?

If capital is internationally mobile and labor is not, then we should expect to see labor bearing all of the tax burden. In this case, employment and unemployment will, in the long run, remain unaffected by changes in the overall tax rate on labor. There is, however, one situation where it is impossible to shift payroll taxes onto workers. That is where there is a rise in the payroll tax and an employee is already receiving the minimum wage. The burden of the extra tax must then fall on the employer because the wage cannot adjust.

What happens in practice? The balance of the evidence suggests that lowering payroll taxes and raising consumption taxes will have no long-run impact on unemployment (OECD, 1990, Annex 6A; OECD, 1994, Table 9.5).<sup>8</sup> This result is confirmed by the fact that if we include the payroll tax rate in any of the regressions in Table 6 or 7, its coefficient is always negligible.<sup>9</sup> It also helps to explain why Denmark, which uniquely has no payroll taxes, has unemployment on a par with

<sup>7</sup> For example, in Britain in 1987–88, only 7 percent of the unemployed had savings in excess of 3,000 pounds, enough to produce an annual interest income of around 10 percent of unemployment benefit (Layard, Nickell and Jackman, 1991, Table A6).

<sup>8</sup> There are some individual country time series results that appear to give a role to payroll taxes in individual countries—see OECD (1994, Chapter 9, p. 247) for a summary. However, in relatively short time series, it is often very difficult to distinguish between long-lasting short-run effects and long-run effects.

<sup>9</sup> For example, in columns of Table 6 its coefficient is -0.014, with a standard error of 0.06.

the European average and appears to derive no special employment benefit from its lack of these taxes.

The evidence on the total tax burden is less clear. One careful cross-country study has ruled out any long-run impact of the total tax burden on employment (OECD, 1990, Annex 6A). However, the results in Tables 6 and 7, row 8, which are in agreement with the findings of Bean, Layard and Nickell (1986), suggest that the overall tax burden may raise unemployment and reduce labor supply. A 10 percentage point fall in the total tax burden reduces unemployment by around 25 percent and raises labor supply by around 2 percentage points on every measure. Of course, a 10 percentage point fall in the total tax burden is enormous. Most countries find permanently reducing expenditure by 1 percent of GDP an extremely difficult task. To generate a 10 percentage point shift would mean, for example, transferring the whole of the UK health service to the private sector.<sup>10</sup>

### **Minimum Wages**

While it is impossible to produce a single cross-country variable that captures the impact of minimum wage laws or related legislation (like extending union pay bargains to the nonunion sector), it is still worth discussing the potential impact of minimum wages on unemployment. A reading of Card and Krueger (1995) and its various reviews in the July 1995 issue of the *Industrial and Labor Relations Review* reveals that there is no consensus on the impact of minimum wages on unemployment. However, the following conclusions do seem to be consistent with the evidence. First, where the minimum wage applies, it is low enough not to have an important effect on the unemployment rates of adult men. Second, minimum wages do have a significant though small adverse impact on youth unemployment rates, particularly in countries like France and Spain where payroll taxes are high and there is little in the way of an age adjustment to the minimum wage (Dolado et al., 1996; Abowd et al., 1996).

### **Labor Supply Measures**

Two much-canvassed solutions to unemployment are reduced hours of work and early retirement. Advocates of these measures often seem to imagine that there is some exogenously given level of work to be done. In fact, all historical evidence shows that, for a given institutional structure, the amount of work to be done tends to adjust in line with the available supply of labor, leaving equilibrium unemployment unaffected. So we can expect that an *imposed* cut in hours or reduction in the labor force will raise wage pressure in a way that can only be offset by an equivalent cut in jobs. Indeed if, in a standard wage equation, we allow wages to depend

<sup>10</sup> Even if there were some macroeconomic benefits to this, there could easily be substantial costs; for example, total health expenditure in the United Kingdom is 4–5 percentage points of GDP less than health expenditure in the United States, without there being notable differences in the overall health of the two populations. Moving health care to the private sector might impair efforts to hold down costs, or result in greater inefficiency.

separately on (the logs of) labor force and employment instead of on unemployment, we typically obtain equal and opposite coefficients. This indicates that a fall in the labor force relative to employment raises wage pressure just as much as a rise in employment relative to the labor force (Layard, Nickell and Jackman, 1991, p. 504; Jackman, Layard and Nickell, 1996, p. 28). Similarly, if one adds measures of labor supply like hours worked per worker to the unemployment regressions in Table 6, no significant effect is found.

### **Shifts in the Demand for Skills and Unemployment**

It has become commonplace to argue: “The rise in joblessness in Europe is thus the flip side of the rise in earnings inequality in the U.S.” (Freeman, 1995, p. 19). This view is based on the notion that first, in all countries, there has been an increase in the relative demand for skilled workers (as against unskilled workers) that has been greater than the increase in their relative supply. Then the argument goes that in Europe, the inflexibility of the labor market has turned this shift into higher unemployment whereas in the United States, labor market flexibility has translated this shift into increased inequality. Finally, this shift explains the majority of the rise in European unemployment relative to that in the United States.

Despite this being a commonly held view, a variety of facts cast doubt on it (Card, Kramarz and Lemieux, 1995; Nickell and Bell, 1995, 1996; Nickell, 1996; Jackman et al., 1996). First, it appears to be the case that in Britain and the United States the demand for skill outran the supply by more than in the rest of Europe. Second, for a variety of European countries including Britain, the evidence suggests that skill shifts account for between 0 and 20 percent of the rise in unemployment from the 1970s. There is no evidence that this number is lower in “flexible” Britain than it is anywhere else in Europe. In any event, the vast majority of the rise in European unemployment is due to other factors. Third, there has been a substantial rise in unskilled unemployment in the United States since the early 1970s (over 100 percent) despite (because of?) the fall in unskilled real wages. Fourth, the adverse impact of the fall in the relative demand for unskilled workers on the wages and unemployment of this group is strongly attenuated in those countries whose education and training systems are particularly effective at raising the human capital of those at the lower end of the ability range (notably middle Europe<sup>11</sup> and Scandinavia).

Overall, therefore, there is no evidence that these skill shifts have made a substantial contribution to the rise in European unemployment nor that labor market inflexibility per se is associated in any simple way with such effects as have been observed.

### **Special Cases and the Demand Side**

Our aim has been to understand what generates high average levels of unemployment over long periods. Business cycle effects and autonomous demand shocks of

<sup>11</sup> That is, Switzerland, Austria, Germany and Holland.

various kinds should wash out if we take a long enough period—and our focus has been on 1983–1996, a 14-year stretch. Despite the length of this period, it is possible to argue that because of exceptional problems, policy mismanagement, very high levels of hysteresis and the like, the average unemployment figures give a distorted picture of the underlying equilibrium rate. If we were just considering the 1990s, this argument might be applied to a number of countries, such as Sweden. But over the longer period, there is only one country where truly exceptional problems have distorted the long period average dramatically, namely Finland. In the three years from 1990 to 1993, Finnish unemployment rose from 3.4 to 17.7 percent. This increase was generated first by the collapse of an enormous domestic credit boom, which was, in its turn, brought about by a mismanaged deregulation of the financial sector. Real house prices fell by over 50 percent between 1990 and 1993. This disaster was reinforced by the more or less complete elimination of Soviet trade over the same period, which had previously been responsible for about one-third of Finnish exports. Without these exceptional events, there is no question that average unemployment would have been substantially lower over the relevant period and this lower number would more accurately reflect the equilibrium rate in Finland.

## Conclusions

High unemployment is associated with the following labor market features: 1) generous unemployment benefits that are allowed to run on indefinitely, combined with little or no pressure on the unemployed to obtain work and low levels of active intervention to increase the ability and willingness of the unemployed to work; 2) high unionization with wages bargained collectively and no coordination between either unions or employers in wage bargaining; 3) high overall taxes impinging on labor or a combination of high minimum wages for young people associated with high payroll taxes; and 4) poor educational standards at the bottom end of the labor market.

Labor market rigidities that do not appear to have serious implications for average levels of unemployment include the following: 1) strict employment protection legislation and general legislation on labor market standards; 2) generous levels of unemployment benefit, so long as these are accompanied by pressure on the unemployed to take jobs by, for example, fixing the duration of benefit and providing resources to raise the ability/willingness of the unemployed to take jobs; and 3) high levels of unionization and union coverage, so long as they are offset by high levels of coordination in wage bargaining, particularly among employers.

Suppose we define high unemployment as above 120 percent of the U.S. rate over the 1983–1996 period (7.8 percent). Then, looking at Table 1, we see there are eight European countries in this category out of 15, as well as Canada. These eight include three major countries (France, Spain and United Kingdom) of which the last has far and away the most flexible labor market in Europe, as normally measured. The remaining countries with high unemployment are Belgium, Denmark, Finland, Ireland and the Netherlands.

Unemployment is high in these countries (excluding Finland, for reasons already explained) partly because, on average, they have reasonably generous benefits with very long periods of entitlement and little in the way of active policies to push the unemployed into work. Wages are typically bargained collectively, so unions apply pressure on wages, but coordination is not high, particularly among employers. Education levels at the lower end of the ability range are generally weak. Of course, not all of these apply to every country, and the country to which they apply least, the Netherlands, is now moving out of the high-unemployment group. Most importantly for the topic of this paper, many features of the labor market that are popularly viewed as serious rigidities apply no more to this high-unemployment group than they do to the low-unemployment group. These include high payroll taxes, high overall taxes, strict employment protection legislation, high labor market standards (legally enforced), high unionization and high benefit replacement rates.

It is clear that the broad-brush analysis that says that European unemployment is high because European labor markets are “rigid” is too vague and probably misleading. Many labor market institutions that conventionally come under the heading of rigidities have no observable impact on unemployment.

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