# The Impact of a Country's Employment Protection Legislation on its Economic Prosperity

**Laura Muller**
Environmental Management Master's Program
Harvard University
Cambridge, MA, 02139
U.S.A.

**Paul D. Berger**
Marketing Department
Bentley University
Waltham, MA 02452
U.S.A.

## Abstract

*This paper will analyze the impact of the employment protection legislation strictness on labor efficiency, unemployment outcomes, international trade outcomes and economy prosperity. Our general hypothesis is that as the strictness of a country's employment protection legislation decreases, the efficiency of its labor increases, the unemployment rate decreases, its imports relative to its exports decrease, and the country's economy improves. We will analyze data archives from the OECD (Organization for Economic Co-operation and Development). A goal of this paper is to find empirical evidence supporting the changes in the labor institutions and laws that potentially would improve a country's economy.*

## *Introduction*

During the two decades before the 2008 financial crisis, Spain experienced strong economic growth. Its economy boomed after it joined the euro zone, and Spaniards had the world highest rate of home-ownership as a result of low interest rates, leading to an increase in construction. However, the financial crisis hit the Spanish economy and sent the country's unemployment rate close to 26%. S&P eventually downgraded Spain's credit rate to BBB-, one level above junk status, and investors started worrying about Spain's solvency, thus forcing it to pay extremely high interest rates and leading the country into a vicious cycle. The size of the Spanish economy and the weakness of its bank worsened the situation, positioning Spain as the greatest problem facing the European Union.

Austerity measures were taken to stop the recession; however, the current problems faced by the Spanish government and its banks were (and still are), in reality, only symptoms of deeper flaws in the Spanish economy. Aside from the reckless spending habits of Spaniards leading to a burst of the housing bubble and the collapse of the construction industry, Spain has been facing an overspending problem caused by the loss of competitiveness of its workforce on the world labor market. Over the past ten years, wages in Spain rose 40% relative to levels in Germany, and with exports being so expensive and imports so cheap, in 2007 and 2008, Spain spent 10% on imports more than it was earning from exports to the rest of the world.

It is therefore essential for Spain to increase the competitiveness of its workforce on the world labor markets. We believe that Spain's economy and society could greatly benefit from decreasing the rigidity of its employment protection laws, thus making its workforce more flexible. Yet, *Spain is just one example of a country needing to improve its economy*. Our research will aim mainly at analyzing and discussing the existence of a relationship between the strictness of a country's employment protection legislation and its economic prosperity.

## *Literature Review*

The relationship between labor protection and productivity growth has been analyzed by Martin *et al*. (2012). They provided empirical evidence that stringent employment protection has an important negative effect on labor market flow and, through this channel, hinders productivity growth.

Evidence also showed that even though a greater labor market re-allocation is beneficial for the workforce through higher real wages and better careers, longer unemployment durations and/or lower real wages in post-displacement positions hurt displaced workers. Longer unemployment durations can decrease the productivity of a worker once he/she returns to work, as well as lower real wages that can provoke a lack of motivation. Martin *et al.* (2012) therefore suggested that reforms of employment protection should be accompanied by laws providing a safety net for unemployed workers and services to help them go back to work.

The relationship between the quality of labor market regulations and institutions and unemployment outcomes has been analyzed by Bernal-Verdugo *et al*. (2012) using a panel of 97 countries from 1985 to 2008. They found that after controlling for certain demographic and macroeconomic variables, there is significant statistical evidence that, as the quality of labor market regulations and institutions increases, a negative impact results both on the level and the change of unemployment outcomes. Among the different independent variables analyzed, hiring and firing regulations, as well as hiring costs were found to have the strongest impact on unemployment outcomes. They concluded that a way to reduce unemployment would therefore be to increase the flexibility of the workforce. As part of our research, we will analyze the relationship between the strictness of the employment protection legislation and international trade outcomes. Our hypothesis is that by decreasing the competitiveness/productivity of the labor force, the employment protection legislation strictness affects negatively a country's exports. Indeed, if it is more expensive to produce in a country because of the lack of flexibility of its labor, this same country will rely more on imports than on exports.

The relationship between labor flexibility and international trade was analyzed by Cuñat *et al.* (2011), who found that even when countries have identical genuine production capabilities, a country can have a comparative advantage if it has different labor market institutions. They showed that the countries with the most flexible labor laws export more than the other countries in industries with more rigid labor laws. This phenomenon might therefore be a possible explanation for the outsourcing of the production of intermediate goods to more flexible labor markets in high-volatility industries. Caballero *et al.* (2012) showed the importance of microeconomic flexibility by associating it with economic growth, by using a panel from 60 countries to discuss the role played by labor regulations in slowing down the creative-destruction process. Their results showed that, especially in countries where job security regulations are likely to be enforced, these regulations hamper the creative-destruction process. For example, "moving from the 20th to the 80th percentile in job security, in countries with a strong rule of law, cuts the annual speed of adjustment to shocks by a third, while shaving off about 1% from annual productivity growth. The same movement has negligible effects in countries with weak rule of law." Our research will also analyze the relationship between the strictness of the employment protection legislation and economic development/prosperity.

We hypothesize that by decreasing the workforce competitiveness/productivity, the strictness of the employment protection legislation affects negatively a country's trade balance, and thus its economic growth. The relationship between a country's international trade strategy and economic growth was analyzed by Balassa (1977) who found that in industrial countries, export-oriented policies lead to a better growth performance than policies favoring import substitution.

The paper explains the results above by the fact that policies favoring exports allow for greater capacity utilization and a better resource allocation according to a comparative advantage, permit the exploitation of economies of scale, generate technological improvements in response to foreign competition, and create jobs in countries with a surplus of labor. The hypothesis that economic growth can be achieved through a growth of exports was also tested by Michaely (1977), and then by Chow (1986). However, Chow (1986) did his analysis using eight Newly Industrializing Countries (NICs). He showed that "there is strong bidirectional causality between the growth of exports and industrial development" (Chow, p.55). This would mean that a strategy favoring exports over imports would not only increase the growth of national income, but would also help developing countries transform their structure.

### *Our Contribution*

Our paper contributes to the empirical literature on the various effects of labor market institutions and laws in several respects. First, it examines the existence of a relationship between the strictness of the employment protection legislation and economic prosperity, which is an area of the literature on the effects of labor market institutions that lacks empirical evidence.

Second, it focuses on a sample of data for the 34 countries that constitute the Organization for Economic Co-operation and Development (OECD). This sample includes the most developed countries in the world and does not include, with a few exceptions, developing or poor countries. This fact is important, if one plans to apply the lessons learnt from our research to suggest a solution to improve the economy in more developed countries (of which Spain, alluded to earlier, is a prime example). Third, it focuses the research on two specific years, 2008 and 2009, that are meaningful in terms of the overall world economic situation. The year 2008 was the start of the global financial crisis, which is considered by many economists as the worst financial crisis since the Great Depression of the 1930s; and 2009 was the year when the consequences of the financial crisis truly hit the economy for most countries. We are interested in analyzing the changes in the relationship between the variables analyzed in our study depending on the overall world economic situation. Fourth, our paper uses a different independent variable than other papers, the employment protection legislation index (EPL index), which focuses narrowly on one set of dimensions of the complex set of factors that influence labor market flexibility.

Our research goes beyond analyzing the relationship between the strictness of the employment protection legislation and overall unemployment; it analyzes, as well, the relationship between the EPL index and many different unemployment outcomes (female unemployment, youth unemployment, unemployment by age group, long-term and short-term unemployment, etc.) and the relationship between the EPL index and some workforce characteristics (e.g., "involuntary" part-time workers, "discouraged" workers). In addition, we consider the relationship between the EPL index and selected societal measures (e.g., suicide rates and several others).

## *Methodology*

We conducted several statistical analyses for two different years, 2008 and 2009, on the impact of the EPL index (employment protection legislation index) on various dependent variables related to the topics of labor productivity, employment and unemployment outcomes, international trade outcomes and economic prosperity. We also study the impact of the EPL index on certain societal characteristics that may be influenced by economic conditions. These studies were performed by running a simple regression analysis between the EPL index and each dependent variable. If the p-value $\leq 0.05$, we conclude the relationship is (and refer to it as) "significant." If $.05 <$ p-value $\leq .1$, we conclude the relationship is (and refer to it as) "moderately significant." If the p-value is greater $> .10$, we conclude that there is no (linear) relationship between the two variables. If a significant or moderately significant relationship is encountered, we analyze the slope coefficient of the regression equation in order to compare the impact of an increase in the EPL index on different dependent variables.

## *The Independent Variable*

We assembled a panel of data for 2008 and 2009 for 34 countries that currently constitute the OECD. Our data source is the Statistical Data Archives of the OECD. Our independent variable is the EPL index elaborated by the OECD which ranges from 0 to 6, 0 being when the employment protection legislation is the least strict and 6 being when it is the most restrictive. This complex index is made up of different OECD indicators that measure the costs and procedures involved in hiring workers on fixed-term or temporary work agency contracts. These indicators result from compiling 21 items and converting them to three main components of employment protection: 1) individual dismissal of workers with regular contracts; 2) additional costs for collective dismissals; 3) regulation of temporary contracts.

The first component incorporates three aspects of dismissal protection: i) procedural inconveniences that employers face when starting the dismissal process; ii) notice periods and severance pay; iii) difficulty of dismissal. The second component of employment protection includes additional delays, notification procedures and costs that are imposed by most countries when an employer fires a large number of workers at one point in time. Finally, the third component of employment protection quantifies regulation of fixed-term and temporary work agency contracts with respect to the types of work for which these contracts are allowed and their duration. The data for our independent variable range from 0.85 to 3.46 and has a mean of 2.233. The median is 2.26 and the standard deviation is 0.679. Exhibit 1 shows the three components and the overall index (last column) for the 34 member-countries in the OECD.

We now list the myriad of dependent variables we study, by category:

### *1. Dependent Variables Related to the Topic of Labor Productivity*

- Average annual hours actually worked per worker
- PDTY: Labor productivity of the total economy
  Details: Labor productivity is defined as output per unit of labor input.
- GDP (expenditure approach) per head, US$, constant prices, constant PPPS, OECD base year
  Details: Expressed in millions. For the Euro area countries, the data in national currency for all years are calculated using the fixed conversion rates against the euro.
- GDP (expenditure approach) per head, US$, current prices, current PPPS, OECD base year
  Details: Expressed in millions. For the Euro area countries, the data in national currency for all years are calculated using the fixed conversion rates against the euro.

### *2. Dependent variables related to the topic of employment and unemployment outcomes*

- Unemployment rate of men
  Details: Population for total age group refers to working age population (15 to 64 years).
- Unemployment rate of women
  Details: Population for total age group refers to working age population (15 to 64 years).
- Unemployment rate
  Details: Population for total age group refers to working age population (15 to 64 years).
- Youth unemployment rate
  Details: Population for this age group refers to population between 15 and 19 years.
- Youth male unemployment rate
  Details: Population for this age group refers to population between 15 and 19 years.
- Youth female unemployment rate
  Details: Population for this age group refers to population between 15 and 19 years.
- Older workers unemployment rate
  Details: Population for this age group refers to population between 55 and 64 years.
- Older workers male unemployment rate
  Details: Population for this age group refers to population between 55 and 64 years.
- Older workers - female unemployment rate
  Details: Population for this age group refers to population between 55 and 64 years.
- Long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for total age group refers to working age population (15 to 64 years).
- Long-term male unemployment (12 months and over) (data expressed in percentages)
  Details: Population for total age group refers to working age population (15 to 64 years).
- Long-term female unemployment (12 months and over) (data expressed in percentages)
  Details: Population for total age group refers to working age population (15 to 64 years).
- Youth long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for this age group refers to population between 15 and 19 years.
- Youth male long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for this age group refers to population between 15 and 19 years.
- Youth female long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for this age group refers to population between 15 and 19 years.

- Older workers long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for this age group refers to population between 55 and 64 years.
- Older workers male long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for this age group refers to population between 55 and 64 years.
- Older workers female long-term unemployment (12 months and over) (data expressed in percentages)
  Details: Population for this age group refers to population between 55 and 64 years.
- Involuntary part-time workers
  Details: Data expressed in thousands of workers. Involuntary part-time workers are part-timers (working less than 30-usual hours per week) because they could not find a full-time job.
- Involuntary male part-time workers
  Details: Data expressed in thousands of workers. Involuntary part-time workers are part-timers (working less than 30-usual hours per week) because they could not find a full-time job.
- Involuntary female part-time workers
  Details: Data expressed in thousands of workers. Involuntary part-time workers are part-timers (working less than 30-usual hours per week) because they could not find a full-time job.
- Discouraged workers
  Details: Data expressed in thousands of person. Discouraged workers are persons not in the labor force who believe that there is no work available due to various reasons and who desire to work.
- Discouraged male workers
  Details: see above.
- Discouraged female workers
  Details: see above.

### *3. Dependent Variables Related to the Topic of International Trade*

- Exports in goods (value), in billions of US$
- Imports in goods (value), in billions of US$
- Net trade in goods (value), in billions of US$

### *4. Dependent Variables Related to the Topic of Economic Prosperity*

- Central government debt as a percentage of GDP
- Central government debt in millions of US$
- Nominal GDP growth
  Details: Economic Outlook No 92 - December 2012 - OECD Annual Projections: *Nominal GDP growth, forecast.*
- GDP (expenditure approach), US$, constant prices, constant PPPs, OECD base year, in millions
- GDP (expenditure approach), US$, current prices, current PPPs, OECD base year, in millions
- EXPPCT1: Public expenditures as a percentage of GDP Total
- EXPPCT2: Public expenditures as a percentage of GDP, Training
- EXPPCT3: Public expenditures as a percentage of GDP, Employment incentives (recruitment incentives and employment maintenance incentives)
- EXPPCT4: Public expenditures as a percentage of GDP, Supported employment and rehabilitation
- EXPPCT5: Public expenditures as a percentage of GDP, Direct job creation

- EXPPCT6: Public expenditures as a percentage of GDP, Start-up incentives
- EXPPCT7: Public expenditures as a percentage of GDP, Out-of-work income maintenance and support
- EXPPCT8: Public expenditures as a percentage of GDP, Early retirement
- Inflow of foreign direct investment in millions of US$

***6. Dependent Variables Related to the Topic of Societal Characteristics that May be Influenced by Economic Conditions***

- Gender wage gap as a percentage
- Infant mortality rate
  Details: Data for the year 2005.
- Mortality rate
- Suicide rates in number of deaths per 100,000 population
- Child well-being - Risky behaviors: smoking
  Details: Percentage of the 15 year-old children who smoke at least once a week, 2005/06.
- Child well-being - Risky behaviors: drunkenness
  Details: Percentage of 13- and 15-years-old children who have been drunk at least twice, 2005/06.
- Child well-being - Risky behaviors: Teenage births
  Details: Adolescent fertility rate (births per 1,000 women ages 15-19), 2005.
- Child well-being - Average disposable income
  Details: Average equalized household disposable income in households with children (0-17-year-olds), USD PPP thousands, circa 2005.
- Child well-being - Educational deprivation
  Details: Percentage of children reporting less than four educational possessions aged 15 years: 2006.
- Child well-being - Housing overcrowding
  Details: Percentage of children living in overcrowding homes as a proportion of all children (2006).
- Child well-being - Poor environmental conditions
  Details: Percentage of children living in homes with poor environmental conditions as a proportion of all children (2006).
- Child well-being - Average mean literacy score
  Details: Average mean PISA literacy score, 2006.
- Child well-being - Literacy inequality
  Details: Ratio of 90th to 10th percentile score in mean PISA literacy achievement.
- Child well-being –Bullying
  Details: Percentage of the children who have been bullied at school at least twice in the last couple of months (11, 13 and 15 year olds).
- Life expectancy females at birth in years
- Life expectancy females at 40 in years
- Number of tertiary education and advanced research programs graduates
  Details: The reference period is the calendar year. All types of institutions. Graduates are those who successfully complete an educational program during the reference year of the data collection. One condition of a successful completion is that students should have enrolled in, and successfully completed, the final year of the corresponding educational program, although not necessarily in the year of reference.

Students who do not complete the final year of an educational program, but later successfully complete a recognized "equivalency" examination based on knowledge learned outside of the education system, should not be counted as graduates. Successful completion is defined according to the graduation requirements established by each country: in some countries, completion occurs as a result of passing a final, curriculum-based examination or series of examinations. In other countries, completion occurs after a specific number of teaching hours has been accumulated (although completion of some or all of the course hours may also involve examinations).

- Number of tertiary education and advanced research programs male graduates
  Details: The reference period is the calendar year. All types of institutions.
- Number of tertiary education and advanced research programs female graduates
  Details: The reference period is the calendar year. All types of institutions.
- Number of upper secondary graduates
  Details: The reference period is the calendar year. All types of institutions.
- Number of upper secondary graduates - males
  Details: The reference period is the calendar year. All types of institutions.
- Number of upper secondary graduates - females
  Details: The reference period is the calendar year. All types of institutions.
- Number of upper secondary graduates
  Details: The reference period is the calendar year. Public institutions.
- Number of upper secondary male graduates
  Details: The reference period is the calendar year. Public institutions.
- Number of upper secondary female graduates
  Details: The reference period is the calendar year. Public institutions.
- Number of upper secondary graduates
  Details: The reference period is the calendar year. Private institutions.
- Number of upper secondary male graduates
  Details: The reference period is the calendar year. Private institutions.
- Number of upper secondary female graduates
  Details: The reference period is the calendar year. Private institutions.
- Number of new entrants in tertiary education
  Details: The reference year is the school year.
- Number of new male entrants in tertiary education
  Details: The reference year is the school year.
- Number of new female entrants in tertiary education
  Details: The reference year is the school year.

## *Main Results*

### *1. Labor Productivity*

The results from the statistical tests we conducted indicate that there is no significant or moderately significant relationship between the EPL index and the dependent variables we used to represent labor productivity. However, moderately significant relationships were found between some of the three individual components of the EPL index and our dependent variables. For example, a moderately significant relationship was found between the labor productivity of the total economy (PDTY) and the strictness of the protection legislation regarding the individual dismissal of workers with regular contracts for 2008.

Here, labor productivity was defined as the output per unit of labor input. The p-value = .065, and for each increase of 1 in the strictness of the protection legislation regarding the individual dismissal of workers with regular contracts, the labor productivity increased by .022. Thus, in 2008, the stricter this aspect of labor protection was, the higher a country's labor productivity was. This relationship may possibly be explained by the fact that employees feel more secure and motivated in their work if they feel that it is harder for them to be dismissed and if the notice period and severance pay are higher. No relationship between these two variables was encountered for 2009, however.

Another moderately significant relationship was also found between the GDP (expenditure approach) per head, US$, current prices, current PPPS, OECD base year, for both 2008 and 2009 and the employment protection legislation regarding the additional costs for collective dismissals. The p-values = .078 and .084 for 2008 and 2009, respectively. For each increase of 1 in the strictness of the employment protection legislation regarding the additional costs for collective dismissals, the GDP per head increased by about $4,140 and $3,759 in 2008 and 2009, respectively. Thus, in 2008 and 2009 the stricter this aspect of labor protection was, the higher a country's labor productivity was, with its impact being slightly stronger in 2008 than 2009. Again, this relationship may possibly be explained by the fact that employees may feel more secure and motivated in their work if they feel that it is harder for them to be dismissed and if the notice period and severance pay are higher.

After a careful review of these results, we conclude that there is a moderately significant relationship between the strictness of certain aspects of the labor protection legislation and labor productivity. Surprisingly, the stricter these aspects of the employment protection legislation are, the more productive the workers are. However, there was no relationship found between the strictness of the labor protection legislation regarding the regulation of temporary contracts and labor productivity.

### *2. Employment and Unemployment Outcomes*

The results indicate that there is a moderately significant relationship between a country's EPL index and its unemployment rate for 2008. The p-value = .059, and for each increase of 1 in the EPL index, the unemployment rate for 2008 increased by 1.1 percentage points. The strictness of a nation's labor protection legislation therefore seems to have a negative impact on society by increasing a country's unemployment rate. However, no relationship was found between these two variables for 2009. Furthermore, the unemployment rate for 2008 seems to have been particularly impacted by the strictness of the regulation on temporary forms of employment, which is one of the three components of employment protection covered by the EPL index. Indeed, our results show a significant relationship between these two variables with a p-value = .046. For each increase of 1 in the strictness of the regulation on temporary forms of employment, the unemployment rate for 2008 increased by 0.7 percentage points. This relationship may possibly be explained by the fact that employers may be more reluctant to employ temporary workers and may, instead, ask permanent workers to work longer hours, given that temporary workers are entitled to receive the same pay and/or conditions as equivalent workers in the user firm. No relationship was found between the unemployment rate and the two other aspects of employment protection covered by the EPL index.

Women, and especially young women, seem to be the individuals in society who are impacted the most by the strictness of the employment protection legislation. Indeed, our results show that there is a significant relationship for 2008 between the EPL index and the unemployment of females and young females with p-values = .011 and .029, respectively. In 2008, for each increase of 1 in the EPL index, the unemployment rates of females and younger females increased by 1.8 and 6.9 percentage points, respectively. However, no relationship between the EPL index and the unemployment rate of males or older females was found for either 2008 or 2009. This possible discrimination against women, and especially younger women, may be explained by the fact that they are often considered as being less productive than men and more likely to ask for holidays or paid leaves if they have a family or are at the age when they could start a family. Older women may be viewed as more productive since they have passed the child bearing age. The women unemployment rate in 2008 was particularly impacted by two aspects of employment protection covered by the EPL index - our results show for 2008 a moderately significant relationship between the strictness of the protection of permanent workers against individual dismissals and the female unemployment rate (p-value = .099), and a significant relationship for 2008 between the strictness of the regulation on temporary forms of employment and the same dependent variable (p-value = .010).

For each increase of 1 in the strictness of the protection of permanent workers against individual dismissals and the strictness of the regulation on temporary forms of employment, the female unemployment rate in 2008 increased by 1.3 and 1.1 percentage points, respectively. Moreover, in 2008 the younger female unemployment rate was particularly impacted by the strictness of the regulation on temporary forms of employment. Indeed, we found a moderately significant relationship for 2008 between these two variables (p-value = .073). For each increase of 1 in the strictness of the regulation on temporary forms of employment, the unemployment rate of younger females increased by 3.4 percentage points.

We were surprised to find no significant or moderately significant relationship between the EPL index and the unemployment rate of younger or older individuals. Because of the lack of work experience of young individuals and because of the possible difference in productivity between an older worker and a younger worker, we expected an increase in the strictness of the employment protection legislation to negatively impact these two groups. We hypothesized that as the EPL index increased, employers would be less willing to hire individuals sometimes considered as less productive because of the increased costs associated with dismissals and temporary contracts. However, we did find a significant relationship between one component of employment protection covered by the EPL index and the unemployment rate of older workers - for 2008, a significant relationship between the strictness of the protection of permanent workers against individual dismissal (p-value = .046). In 2008, for each increase of 1 in the strictness of the protection of permanent workers against individual dismissal the older workers unemployment rate increased by 0.9 percentage points.

The strictness of the employment protection legislation also seems to impact the length of unemployment. Results show a moderately significant relationship between the EPL index and long-term unemployment for 2008. Here, long-term unemployment is defined as unemployment lasting 12 months or more. The p-value = .074, and in 2008, for each increase of 1 in the EPL index, the long-term unemployment rate increased by 7.9 percentage points. The length of an individual's unemployment period therefore seems to be negatively impacted by the strictness of the employment protection legislation, and more specifically by the strictness of the protection of permanent workers against individual dismissal. Our results show a significant relationship for 2008 and a moderately significant relationship for 2009 between the strictness of this particular component of employment protection covered by the EPL index and the long-term unemployment rate (p-value = .020 for 2008 and .095 for 2009). In 2008 and 2009, for each increase of 1 in the strictness of the protection of permanent workers against individual dismissal, the long-term unemployment rate increased by 11 and 6.5 percentage points, respectively.

The length of the unemployment of females, younger females and older workers overall seems to be particularly negatively affected by the strictness of the employment protection legislation. We found a significant relationship for 2008 between the EPL index and the long-term unemployment of females, younger females and older workers overall, with p-values = .020, .024 and .020, respectively. In 2008, for each increase of 1 in the EPL index, the long-term unemployment of females, younger females and older workers overall increased by 10.5, 9.5 and 13.1 percentage points, respectively. The individuals that were most negatively impacted were, therefore, older workers overall, something that may be possibly explained by the fact that employers may be less likely to hire workers who will be (rightly or wrongly) viewed as less productive over time and more expensive because of their increasing age and approaching retirement. Furthermore, we encountered a significant relationship for both 2008 and 2009 between the EPL index and the long-term unemployment of older females, and for 2008 between the EPL index and the long-term unemployment rate of older males. Older females seem to be impacted more strongly by increases in the EPL index than older males: in 2008, for each increase of 1 in the EPL index, the long-term unemployment rate of older females increased by 17.3 percentage points, whereas the long-term unemployment rate of older males increased by [only] 12.7 percentage points.

Our results also show for 2009 a moderately significant relationship between the EPL index and the number of male part-time workers who are *involuntary* part-time workers. *Involuntary* part-time workers are part-timers working less than 30 hours per week because they are not able to find a full-time job. For 2009, the p-value = .099, and for each increase of 1 in the EPL index the number of involuntary male part-time workers decreased by 171,400. However, no relationship was encountered between the EPL index and the total population of involuntary part-timers or between the EPL index and involuntary female part-timers. Finally, we found a significant relationship for both 2008 and 2009 between the strictness of the employment protection legislation, represented in our analysis by the EPL index, and the numbers of male *discouraged* workers.

*Discouraged* workers are defined as individuals not in the labor force who believe that there is no work available but who desire to work. The p-values = .039 for 2008 and .036 for 2009. For each increase of 1 in the EPL index, the number of discouraged male workers decreased by 47,900 and 78,000 in 2008 and 2009, respectively. This relationship may possibly be explained by the fact that stricter employment protection legislation may give the false impression to males of a friendlier labor market in which it might be easier to encounter a job. In 2008 and 2009, the number of male discouraged workers was particularly impacted by two components of the employment protection covered by the EPL index; we found for 2008 and 2009 a significant relationship between the strictness of the protection of permanent workers against individual dismissals and the number of discouraged male workers with p-values = .029 and .022, respectively, and a moderately significant relationship between the strictness of the regulation on temporary employment and the same dependent variable with p-values = .095 and .080, respectively. No relationship was encountered between this dependent variable and the strictness of the specific requirements for collective dismissals.

### *3. International Trade*

Surprisingly, results indicated no relationship between the EPL index and the value of the exports in goods or the value of the imports in goods of OECD countries. However, our results show a moderately significant relationship between the EPL index and the value of the net trade in goods for 2009 (p-value = .098). These results are surprising because we would theoretically expect a higher EPL index to decrease the competitiveness/productivity of a country's labor force, and thus to affect negatively the country's exports. Then, if it is more expensive to produce in a country because of the lack of flexibility of its labor, we might expect this same country to rely more on imports than on exports. Even more surprising is the fact that for an increase of 1 in the EPL index in 2009, the value of the net trade in goods *increased* by 3.5 billion dollars. However, this is consistent with our previous results that showed that an increase in the strictness of a country's protection of permanent workers against individual dismissal and specific requirements for collective dismissal increased the country's labor productivity.

Furthermore, a country's international trade outcomes seem to be particularly impacted by one component of employment protection covered by the EPL index: indeed, our results show a significant relationship for both 2008 and 2009 between the strictness of the protection of permanent workers against individual dismissal and both the value of imports in goods of a country (p-value = .042 for each year) and the net trade in goods (p-value =.007 for 2008 and .005 for 2009). In 2008, for an increase of 1 in the strictness of the protection of permanent workers against individual dismissal, the value of imports in goods decreased by 19.5 billion dollars and the net trade in goods increased by 9.4 billion dollars. While an unexpected result, stricter employment protection legislation apparently seems to have a *positive* impact on the international trade outcomes of a country.

### *4. Economic Prosperity*

Our results show that as the strictness of the employment protection legislation increases, a country's economic situation will be impacted negatively. We found a significant (negative) relationship for both 2008 and 2009 between the EPL index and a country's GDP (expenditure approach, US$, constant prices, constant PPPs, OECD base year, in millions). The p-value = .046 for 2008 and .044 for 2009, The GDP was especially impacted by one component of employment protection covered by the EPL index: our results show a significant (negative) relationship for both 2008 and 2009 between the strictness of the protection of permanent workers against individual dismissal and a country's GDP with p-values = .008 and .007 for 2008 and 2009, respectively. No relationship was found between this dependent variable and the strictness of the two other components of employment protection covered by the EPL index for either 2008 or 2009. However, our results do show a moderately significant relationship for both 2008 and 2009 between the strictness of the specific requirements for collective dismissal and a country's nominal GDP growth (p-values = .086 for 2008 and .092 for 2009).

Our results also show that as the strictness of the employment protection legislation increases, the inflow of foreign direct investment in a country decreases dramatically. We found a significant relationship for 2009 between the EPL index and a country's inflow of foreign direct investment (p-value = .019). For an increase of 1 in the EPL index in 2009 a country's inflow of foreign direct investment decreased by 17 million dollars. This dependent variable seems to be particularly impacted by the strictness of two of the components of employment protection covered by the EPL index.

For 2008, a significant relationship between the strictness of the protection of permanent workers against individual dismissal and a country's inflow of foreign direct investment (p-value = .005). For an increase of 1 in the independent variable, a country's inflow of foreign direct investment decreased by 47 million dollars. Furthermore, a moderately significant relationship was encountered for 2009 between the strictness of the regulation of temporary forms of employment and the dependent variable (p-value = .064). For an increase of 1 in the strictness of the regulation on temporary forms of employment the inflow of foreign direct investment decreased by 8 million dollars. The two relationships we just mentioned above may be due to the fact that as it becomes harder and more expensive to fire and hire permanent and temporary workers, foreign investors may tend to invest in other countries where the labor force is more flexible and cheaper.

## *5. Societal Characteristics that May be Influenced by Economic Conditions*

Since the strictness of the employment protection legislation affects negatively a country's unemployment rate and economic/financial prosperity, we believe that it will indirectly affect certain social and societal characteristics of a country. Our results show, for example, a significant relationship for 2008 between the EPL index and a country's suicide rate in terms of the number of deaths per 100,000 inhabitants (p-value = .015). In 2008, for each increase of 1 in the EPL index there was a 2.1 percentage point *decrease* in the suicide rate in number of deaths per 100,000 inhabitants. This, of course, is a *positive* result for society.

However, other relationships were not so positive for society. Children's well-being seems to be very much negatively impacted by the strictness of the employment protection legislation. For 2008 a moderately significant relationship between the EPL index and a child's risky behaviors such as smoking (p-value = .086). This dependent variable represented the percentage of the 15 year-old children who smoke at least once a week. For each increase of 1 in the EPL index, the percentage of 15 year-olds who smoke at least once a week increased by 2.4 percentage points. Our results also show a moderately significant relationship for 2008 between the EPL index and the average equalized household disposable income in households with children in between 0 and 17 years-old (p-value = .065). For each increase of 1 in the EPL index the average equalized household disposable income decreased by $3,400. Furthermore, we also found for 2008 a significant relationship between the EPL index and the child mean literacy score (p-value = .001).

The data for the child mean literacy score represented the mean PISA literacy score for the year 2006. For an increase in 1 in the EPL index the mean PISA literary score decreased by 23.7. Our results did not show any relationship between the EPL index and child bullying; however, there was a significant relationship between the strictness of the regulation on temporary forms of employment and children bullying (p-value = .024). Child bullying was defined as the percentage of the children who have been bullied at school at least twice in the last two months (11, 13 and 15 year olds). For an increase of 1 in the strictness of the regulation on temporary forms of employment, child bulling increased by 1.9 percentage points in 2008. Increased strictness of the employment protection legislation, therefore, seems to have strong negative consequences on children's well-being.

Furthermore, educational outcomes also seem to be negatively impacted by increased EPL index. For example, our results show a significant (negative) relationship for 2008 between the number advanced research-program graduates and the EPL index (p-value = .048). For each increase of 1 in the EPL index, the number of graduates decreased by 208,790. However, female graduates were negatively impacted even more strongly. For an increase of 1 in the EPL index, the number of female graduates decreased by 119,501, whereas the number of male graduates decreased only by 89,288. We also encountered a moderately significant relationship for 2008 between the EPL index and the number of upper secondary male graduates from public institutions (p-value = .095). For each increase of 1 in the EPL index, the number of upper secondary male graduates from public institutions decreased by 128,518. However, no relationship for either 2008 or 2009 was found between the EPL index and the number of upper secondary female graduates from public institutions or between the EPL index and the overall number of upper secondary graduates from private institutions.

Finally, our results show a moderately significant relationship for 2008 between the EPL index and the number of new entrants in tertiary education (p-value = .054). In 2008, for each increase of 1 in the EPL index, the number of new entrants in tertiary education decreased by 263,054. However, females and males were not impacted in the same way. Indeed, in 2008, for each increase in 1 in the EPL index the number of new female entrants in tertiary education decreased by 145,152, whereas the number of new male entrants decreased by only 117,903.

An increased strictness of the employment protection legislation, therefore, seems to have strong negative consequences on beneficial societal educational outcomes.

## *Conclusion*

Our main hypothesis was that as the strictness of a country's employment protection legislation increases, the economic prosperity of the country will be negatively impacted. Indeed, we hypothesized that by decreasing the workforce competitiveness/efficiency, the strictness of a country's employment protection legislation affects negatively the country's trade balance, and thus its economic growth. Our results, by and large, support this hypothesis and more specifically concerning a country's GDP and inflow of foreign direct investment. Moreover, our results show that stricter employment protection legislation impacts negatively a country's unemployment rates and the length of unemployment. Individuals who tend to be more affected are females and young adults.

However, we did not find a negative relationship between the strictness of the employment protection legislation and labor productivity. On the contrary - our results indicate that stricter protection of permanent workers against individual dismissals impacts *positively* a country's labor productivity. Also, we were surprised to find that as the strictness of the employment protection increases, a country's net trade in goods increases. Yet, this is consistent with the previous point. Finally, we also found that stricter employment protection legislation impacts negatively other fields, such as children's well-being and educational outcomes. Overall, our results lead us to the conclusion that countries should decrease the strictness of its employment protection legislation if it wants to decrease its unemployment rate and improve its economic situation. More specifically, the country should decrease the strictness of the regulations on the protection of permanent workers against individual dismissals. This was the component of the EPL index that impacted the most a country's economic prosperity, unemployment rate and societal characteristics.

As we indicated in the introduction, our motivation for this paper began with a look at the economic situation in Spain. Recently, some reforms in the employment protection field have been made in Spain with the goal of improving the economic situation. Yet, they all failed because of other aspects of Spain's industrial relations and labor market, such as the combination of labor ordinances which hinder internal flexibility, and a worker representation system which encourages "insiderism." These two features will need to be modified if the less strict employment protection legislation is to have its desired effect. And, it is also indicated that there may be other forces at work in other countries that have not been accounted for in our analyses.

## *A Final Note*

In performing this study, we conducted about a few hundred statistical tests – there were about 76 different dependent variables, each studied for each of two years. Also, in some instances, components of the EPL index, not only the overall index, were studied. Doing so many hypothesis tests raises the specter of finding significant results by chance. After all, if one performs 300 statistical tests with significance level of .05, on average one will find 15 results with p-value < .05, *even if the null hypothesis is true for all three-hundred cases*. We are aware of this issue, and wish to note that we found many more "significant ($p \leq .05$)" results than would be expected just by chance. However, "moderately significant ($.05 < p \leq .10$)" results may contain several "type I errors" (i.e., a false rejection of the no–impact null hypothesis) due to this phenomenon. Still, in spite of the need for the moderately significant results to be examined more closely, we stand by our primary, overriding conclusion, that a larger EPL index value is detrimental to the large majority of economic indicators in a country and, more so than not, detrimental for society in that country. We encourage further work, with finer resolution, to clarify several of these findings.

## *References*

Balassa, B. (1978). Exports and economic growth: Further evidence. *Journal of Development Economic*s, 5(12), p.181-189.

Bernal-Verdugo, L., Furceri, D., & Guillaume, D. (2012). Labor market flexibility and unemployment: New empirical evidence of static and dynamic effects. *Comparative Economic Studies*, vol. 54, p.251-273.

Caballero, R., Cowan, K., Engal, A., & Micco, A. (2013). Effective labor regulation and microeconomic flexibility. *Journal of Development Economics*, vol. 101, p.93-104.

Chow, P. (1987). Causality between export growth and industrial development: Empirical evidence from NIC's. *Journal of Development Economics*, 26(1), p.55-63.

Cunat, A., & Melitz, M. (2012). Volatility, labor market flexibility, and the pattern of comparative advantage. *Journal of European Economic Association*, 10(2), p.225-254.

Martin, J., & Scarpetta, S. (2012). Setting it right: Employment protection, labour reallocation, and productivity, *De Economist*, 160(1), p.89-116.

Michaely, M. (1979). Exports and growth: A reply, *Journal of Development Economics*, 6(1), p. 141-143.

OECD. (2012) Employment Protection Legislation Strictness Index. *Organization for Economic Co-operation and Development.*

***Exhibit 1***

*Employment protection in OECD countries, 2008 and 2009*
*Scale from 0 (least restrictions) to 6 (most restrictions)*

| | Component 1 | Component 2 | Component 3 | **OVERALL** |
|---|---|---|---|---|
| OECD countries | Protection of permanent workers against (individual) dismissal | Regulation on temporary forms of employment | Specific requirements for collective dismissal | **OECD employment protection index** |
| Australia | 1.37 | 0.79 | 2.88 | **1.38** |
| Austria | 2.19 | 2.29 | 3.25 | **2.41** |
| Belgium | 1.94 | 2.67 | 4.13 | **2.61** |
| Canada | 1.17 | 0.22 | 2.63 | **1.02** |
| Chile | 2.59 | 2.04 | 0 | **1.93** |
| Czech Republic | 3 | 1.71 | 2.13 | **2.32** |
| Denmark | 1.53 | 1.79 | 3.13 | **1.91** |
| Estonia | 2.27 | 2.17 | 3.25 | **2.39** |
| Finland | 2.38 | 2.17 | 2.38 | **2.29** |
| France | 2.6 | 3.75 | 2.13 | **3** |
| Germany | 2.85 | 1.96 | 3.75 | **2.63** |
| Greece | 2.28 | 3.54 | 3.25 | **2.97** |
| Hungary | 1.82 | 2.08 | 2.88 | **2.11** |
| Iceland | 2.12 | 1.54 | 3.5 | **2.11** |
| Ireland | 1.67 | 0.71 | 2.38 | **1.39** |
| Israel | 2.19 | 1.58 | 1.88 | **1.88** |
| Italy | 1.69 | 2.54 | 4.88 | **2.58** |
| Japan | 2.05 | 1.5 | 1.5 | **1.73** |
| Korea | 2.29 | 2.08 | 1.88 | **2.13** |
| Luxembourg | 2.68 | 3.92 | 3.88 | **3.39** |
| Mexico | 2.25 | 4 | 3.75 | **3.23** |
| Netherlands | 2.73 | 1.42 | 3 | **2.23** |
| New Zealand | 1.54 | 1.08 | 0.38 | **1.16** |
| Norway | 2.2 | 3 | 2.88 | **2.65** |
| Poland | 2.01 | 2.33 | 3.63 | **2.41** |
| Portugal | 3.51 | 2.54 | 1.88 | **2.84** |
| Slovak Republic | 2.45 | 1.17 | 3.75 | **2.13** |
| Slovenia | 2.98 | 2.5 | 2.88 | **2.76** |
| Spain | 2.38 | 3.83 | 3.13 | **3.11** |
| Sweden | 2.72 | 0.71 | 3.75 | **2.06** |
| Switzerland | 1.19 | 1.5 | 3.88 | **1.77** |
| Turkey | 2.48 | 4.88 | 2.38 | **3.46** |
| United Kingdom | 1.17 | 0.29 | 2.88 | **1.09** |
| United States | 0.56 | 0.33 | 2.88 | **0.85** |

*Source: OECD. To find out more about the methodology used to calculate the OECD employment protection indicators, see www.oecd.org/employment/protection.*