

# **Labour Market Flexibility, Employment and Unemployment in Europe**

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## **Abstract:**

This paper analyses the impact of employment protection legislation on the employment and unemployment rates in the European Union over the period 1999-2012. The results of our theoretical and empirical analyses show that only the level of the employment protection for temporary workers had a significant positive impact on employment growth. Although the results differ when the periods 1999-2007 and 2008-2012 are analysed separately, in most cases the effects of the employment protection are not robust. Moreover, when a significant robust impact is found, this is contrary to what it is argued by mainstream analyses.

**Keywords:** Employment protection legislation, employment, unemployment

**JEL Classification:** E24, J21, J41, J48, J68

## **Introduction**

According to the New Consensus Macroeconomics, labour market institutions are behind the high unemployment rates. The dynamics of unemployment is explained by the interaction of adverse shocks with adverse labour market institutions: unproductive institutions increase the impact of shocks on unemployment, accentuating hysteresis effects through an increase in the long-term unemployment (Blanchard and Wolfers, 2000). Consequently, the countries with flexible labour markets show the best results of employment and unemployment. The policy recommendations are obvious: to enjoy low and stable unemployment rates, labour markets should be reformed, making them more

flexible, acting on those legal and institutional elements that generate a low flexibility in the wage-setting process and in the adjustment of the company workforces.

Fuelled by these arguments, and the recommendations made by international organizations, many economies have approved labour market reforms, which acted on what was presumed to be the main sources of rigidities in the labour market: the unemployment protection schemes, the collective bargaining and the employment protection legislation (Brancaccio et al., 2018; Tridico and Pariboni, 2017).

Despite the spreading and intensity of these reforms, the empirical evidence about the impact on employment and unemployment of labour institutions is not conclusive (Avdagic and Salardi, 2013; Bertola, 2017). For Keynesian economists, labour institutions are not a key determinant of the labour market results. Only an increase in capital accumulation, fuelled by expansionary demand-side policies, would reduce unemployment rates (Hein, 2017; Jump and Stockhammer, 2019; Stockhammer et al., 2014). This recommendation is shared by mainstream economists, such as Ball (2014) and Blanchard and Summers (2017). They argue that the high unemployment rates in many European countries are explained by the hysteresis effects generated by restrictive demand-side policies; hence, the need for a change in the strategies of macroeconomic policy.

Furthermore, many studies argue that labour market institutions have positive effects on the labour market and economic activity. These include lower unemployment, higher employment, more quality of jobs, smoother fluctuations of economic activity, more egalitarian distribution of income, higher accumulation of human and physical capital, and more innovation (Brancaccio, et al., 2018; Ciminelli et al., 2018; Dosi et al., 2017, 2018; Flaschel et al., 2012).

Mainstream studies have focused on the impact of employment protection legislation (EPL). They argue that a high employment protection have negative micro and macroeconomic effects, deteriorating labour market performance; hence, many countries have introduced in the last decades reforms to reduce that protection. The objective of this contribution is to check whether EPL is a significant determinant of the dynamics of

employment and unemployment rates in the European Union countries over the period 1999-2012.

The paper is structured as follows. In section 2, we provide a short review of the literature about the impact of employment protection legislation on employment and unemployment rates. In section 3, we present the theoretical model and the emerging testable hypothesis. Section 4 presents and analyses the results of the empirical analysis. Finally, section 5 summarises and concludes

## **Literature Review**

The employment protection legislation is the set of rules that in each country governs the hiring and firing of employees. The hiring rules are the conditions for the use of standard (full-time permanent contracts) and non-standard employment contracts (part-time, fixed-term, and temporary agency workers). The firing rules govern individual and collective dismissals of workers with standard permanent contracts. This legislation aims to provide workers with certain levels of protection and security in their jobs by specifying the requirements that employers must observe and respect in hiring and dismissing (permanent) workers.

In the New Consensus Macroeconomics, the employment protection legislation generates rigidities in the functioning of the labour market, leading to unemployment and, if firing costs or restrictions differ among groups of workers, labour segmentation. To reduce the high unemployment rates, since the eighties, many countries have approved labour reforms curbing firing costs and favouring the use of non-standard employment contracts. In many cases, the removal of restrictions on the use of temporary contracts accompanied the setting of lower compensations for the extinction of temporary contracts (in comparison with those for permanent contracts), thereby giving rise to a segmented labour market and a rising share of atypical employment contracts.

Despite the generalization of these reforms, there is no unambiguous empirical evidence on the impact of these measures on employment and unemployment rates (Bertola, 2017; Boeri, et al., 2015; Heyes and Lewis, 2015; OECD, 2018). For Blanchard and Wolfers

(2000), the implementation of measures increasing employment protection in the late seventies led to the rise in the structural unemployment in European economies. These measures would have implied a disincentive to hiring (and to capital accumulation and productivity growth) resulting in higher structural unemployment. These arguments were accepted by international organizations, which recommended reducing employment protection, mainly for permanent workers, to ensure lower and more stable unemployment rates (OECD, 2006, 2018).

However, many studies conclude that high employment protection has no negative impact on unemployment (Avdagic, 2015; Avdagic and Salardi, 2013; Bertola, 2017; Flaschel et al., 2012). Indeed, many papers focus on the adverse economic consequences generated by these reforms, highlighting the negative effects on labour segmentation, income distribution, job quality, household consumption and borrowing, innovation, competitiveness, productivity growth, and poverty (Brancaccio et al., 2018; Damiani et al., 2016; Gutierrez-Barbarrusa, 2016; Heyes and Lewis, 2015; Kleinknecht, 2013; OECD, 2018; Rubery and Piasna, 2016; Tridico, 2017).

Surprisingly, mainstream economists do not categorically claim that employment protection has a negative impact on labour market. Blanchard and Wolfers (2000) and Blanchard (2017) argue that it is *likely* that the higher employment protection registered in the seventies increased the natural unemployment rate. For the OECD (2018) employment protection for permanent workers “tends to have either no or a small negative effect on employment” (OECD, 2018: 124); and an *excessive* employment protection for these workers can have negative consequences on job quality, inclusiveness and productivity only if it comes with a lower protection for temporary workers. Other studies argue that the effects of the EPL differ among groups of workers, depending on gender, age, skills, or type of employment contract; with the effect on aggregate employment or unemployment being uncertain (Boeri et al., 2015; Gal and Theising, 2015).

The doubts about the effects of the EPL have increased with recent studies that focus on the period after the onset of the Global Financial Crisis. Anderton et al. (2012) and Boeri and Jimeno (2016) argue that a high employment protection for permanent workers is associated with higher increases of unemployment in Europe. In contrast, Stockhammer et al. (2014) conclude that EPL does not have a significant impact on unemployment rates

in OECD countries. For Blanchard (2017), EPL is not a significant determinant of unemployment rates. Lastly, Ferreiro and Gomez (2017) and Tridico (2017) show that, during the Great Recession, the European Union countries with high employment protection show the best labour market results.

Furthermore, some recent papers (Boeri and Jimeno, 2016; de Almeida and Balasundharam, 2018; Duval and Furceri, 2018; Duval et al., 2019; OECD, 2012, 2017) argue that the impact of employment protection depends on the phase of the business cycle; therefore, it has no impact on employment and unemployment in the long-term.

### **Theoretical Framework**

The objective of this contribution is to analyse whether the levels and changes in employment protection legislation affect the changes in employment and unemployment rates in European Union countries.

The models we test use the Gross Domestic Product (GDP) and the Gross Fixed Capital Formation (GFCF) growth rates as explanatory variables related to the economic fluctuations. Although most papers use the GDP growth, Keynesian studies emphasize the role played by capital accumulation as driver of employment and unemployment. By testing separately the impact of GDP and GFCF growth rates, not only do we test the validity of the Keynesians studies, but we also test the robustness of the conclusions reached on the impact of EPL on employment and unemployment. A significant impact of employment protection on labour market exists when it is not affected by the choice of the economic variable related to the economic fluctuations (GDP or GFCF).

To estimate the effects of the employment protection legislation, we use the EPL indexes elaborated by the OECD. OECD EPL indexes measure the strictness of employment protection for permanent and temporary contracts, constructing synthetic indicators based on the values attached to 21 different items. Each indicator is measured on a 0-6 score, where higher values represent a stricter regulation and, consequently, a more rigid labour market. The score of each index is calculated based on the regulation in force on the 1st of January of each year

These indexes have several advantages. Given the common methodology to elaborate the indexes, they allow comparing the employment protection legislation among countries. Moreover, the changes in the labour law imply a change in the value of the indexes. A labour law reform making the labour market more flexible implies a decline of the score, and vice versa, with more intense reforms implying larger changes in the indexes. These indexes have problems to measure the true flexibility-rigidity of the labour markets, such as the inability to measure employment protection based on other norms than legal ones, and the failure to account for procedural requirements in assessing the difficulties and costs of carrying out individual and collective dismissals (Harcourt et al., 2019; Myant and Brandhuer, 2016). Nonetheless, their use in empirical analyses is widespread, thus allowing to comparing results from different studies.

The OECD calculates four indexes: the EPRC index measures the protection of regular-permanent workers against individual and collective dismissals, while the EPT index measures the regulation of temporary forms of employment, mainly, fixed-term and temporary agency workers. The EPRC index is split into two indexes: the EPR index, related to the protection of permanent workers against individual dismissal, and the EPC index, related to the specific additional requirements for collective dismissals of permanent workers.

In this paper, we seek to analyse separately the impact of the protection of permanent workers against individual and collective dismissals. Consequently, we use the EPR, the EPC and the EPT indexes. Besides the levels in country  $i$  of the three  $j$  EPL indexes at the beginning of year  $t$  ( $EPL_{i,j,t}$ ), we also test the impact of the labour reforms, which change the rules affecting the employment protection for permanent and temporary workers. The variable  $\Delta EPL_{j,i,t}$  shows for each year  $t$  the change in country  $i$  of the  $j$  EPL indexes.

The changes in the current year of the EPL indexes can provide a limited information about the impact of the changes in the employment protection legislation. Employers' decisions of firing and hiring may be influenced by past decisions and experiences and not so much by new regulations. Therefore, there can be a lag between the time when a labour reform is approved and the time when it effectively changes the decisions of

hiring-working workers. Moreover, the change in the indexes does not inform about which date of the year such a reform is approved and comes into force. Surely, a reform approved in January has a bigger impact in that year on labour markets than a similar reform approved in December. To avoid these problems, our models include as explanatory variables the lagged change in the EPL indexes,  $\Delta EPL_{j,i,t-1}$ .

Data for the EPC index are available since 1998. Given that we seek to estimate the impact of the current and lagged changes in the EPL indexes, our study analyse the determinants of the labour market performance between 1999 and 2012. Therefore, we have a balanced panel with 252 observations (18 countries<sup>1</sup> and 14 years).

To analyse the labour market performance based only on the changes in the economic activity and the labour market flexibility, implies that we assume that only labour demand matters and that labour supply is constant. However, changes in labour supply, generated by demographic changes in population, migration flows, ageing processes, etc., may affect labour markets. To account for these problems related to the changes in the labour supply, we include as an explanatory variable the change in the size of working age population. The variable  $POP_{i,t}$  shows the growth rate of population between 16 and 64 years in country  $i$  in the year  $t$  (data provided by Eurostat).

Therefore, we test four models that include the growth rate of working age population levels, changes and lagged changes of the EPR, EPC and EPT indexes, and that differ in terms of the dependent variable (employment growth rate or growth of unemployment rates) and the explanatory variable related to economic fluctuations (GDP and the GFCF growth rate:  $\Delta GDP$  and  $\Delta GFCF$ )<sup>2</sup>.

We must note that we do not test whether labour market flexibility is associated with the level of employment or the unemployment rate. Since the dependent variables are measured in terms of changes, we test whether the economic growth and the levels and changes in the EPL indexes affect the changes in employment and unemployment rates. From an orthodox perspective, the worse employment and unemployment performances

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<sup>1</sup> Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, and the United Kingdom.

<sup>2</sup> Data provided by Eurostat.

happen with low rates of economic activity growth, high levels of employment protection, and labour reforms increasing the EPL indexes.

The impact of the growth of working age population is uncertain. The reason is that it is not the working age population but the economically active working age population that actually matters. The changes in the working age population matter only if we assume a constant activity rate: for a given demand of workers, a growing working age population may lead to more employment (at the expense of lower real wages) and vice versa. The effect on unemployment is not so clear: a larger working age population may lead to more employment and more higher unemployment if not all new job seekers get a job. However, if the growth rate of unemployment is below the growth rate of working population, the unemployment rate declines.

## **Empirical Framework**

### *Utilised Data*

Table 1 shows the main descriptive statistics of the variables employed in this contribution for the whole period 1999-2012, and the sub-periods 1999-2007 and 2008-2012. The period 1999-2012 is characterized by growth of economic activity and population, and an increase in employment and unemployment rates. The sub-period 1999-2007 is characterized by growth of economic activity, employment and working age population, and a decline in unemployment rate; whereas the sub-period 2008-2012 is characterized by a decline in economic activity and employment, a low growth of the working age population, and a high growth of unemployment rates.

Regarding the EPL indexes, the mean value of all indexes declines in all periods, showing a generalized, with exceptions, process making the conditions to hire and fire workers more flexible. However, the median value of the changes in the EPL indexes is zero because of the small number of observations with changes in the indexes. In 1999-2012 (252 observations) the EPR, the EPT and the EPC indexes changed in 30, 31, and 11 observations, respectively. However, these changes are not evenly distributed: in 1999-2007 (162 observations), the EPR, EPC and EPT indexes changed in 11, 5, and 18 observations, respectively; but in 2008-2012 (90 observations), the EPR, EPC and EPT



indexes changed in 19, 5, and 13 observations, respectively. These data show that the frequency of labour market reforms accelerated during the Great Recession. Moreover, the intensity of these reforms also changed. The mean value of the changes in the EPC and EPT indexes is lower in 2008-2012 than in 1999-2007; in contrast, the change in the EPR index is higher in 2008-2012.

Table 1. Descriptive statistics

	1999-2012					1999-2007					2008-2012				
	Mean	Median	Maximum	Minimum	Std Dev	Mean	Median	Maximum	Minimum	Std Dev	Mean	Median	Maximum	Minimum	Std Dev
$\Delta$ Employment	0.561	0.698	6.667	-8.620	2.142	1.264	1.218	6.667	-3.012	1.715	-0.705	-0.270	3.741	-8.620	2.258
$\Delta$ Unemployment rate	0.151	0.000	6.600	-4.300	1.379	-0.212	-0.250	3.800	-4.300	1.066	0.806	0.350	6.600	-2.500	1.623
$\Delta$ GDP	2.000	2.332	10.800	-9.132	2.997	3.220	3.237	10.800	-0.934	1.967	-0.194	0.616	5.992	-9.132	3.279
$\Delta$ GFCF	1.286	2.074	19.389	-23.458	7.153	3.833	3.607	19.389	-15.252	5.355	-3.298	-1.860	16.018	-23.458	7.704
$\Delta$ POP15-64	0.369	0.298	3.953	-2.535	0.764	0.560	0.442	3.953	-1.484	0.768	0.024	0.089	1.802	-2.535	0.625
EPR	2.432	2.357	4.583	1.095	0.679	2.461	2.363	4.583	1.095	0.702	2.381	2.357	4.417	1.262	0.636
$\Delta$ EPR <sub>t</sub>	-0.018	0.000	0.190	-0.635	0.087	-0.007	0.000	0.167	-0.381	0.047	-0.037	0.000	0.190	-0.635	0.129
$\Delta$ EPR <sub>t-1</sub>	-0.013	0.000	0.190	-0.635	0.078	-0.007	0.000	0.167	-0.381	0.048	-0.025	0.000	0.190	-0.635	0.114
EPC	3.218	3.250	5.125	1.625	0.761	3.252	3.250	5.125	1.875	0.733	3.156	3.250	5.125	1.625	0.809
$\Delta$ EPC <sub>t</sub>	-0.011	0.000	0.750	-1.000	0.109	-0.012	0.000	0.750	-1.000	0.124	-0.008	0.000	0.250	-0.375	0.076
$\Delta$ EPC <sub>t-1</sub>	-0.009	0.000	0.750	-1.000	0.102	-0.005	0.000	0.750	-0.750	0.094	-0.018	0.000	0.000	-1.000	0.115
EPT	1.682	1.438	4.750	0.250	1.015	1.716	1.406	4.750	0.250	1.110	1.622	1.500	3.625	0.375	0.820
$\Delta$ EPT <sub>t</sub>	-0.015	0.000	1.500	-2.000	0.216	-0.022	0.000	1.500	-2.000	0.264	-0.004	0.000	0.188	-0.438	0.074
$\Delta$ EPT <sub>t-1</sub>	-0.017	0.000	1.500	-2.000	0.217	-0.023	0.000	1.500	-2.000	0.245	-0.007	0.000	1.000	-0.625	0.157

Source: Our calculations based on Eurostat and OECD

Table 2. Changes recorded in the EPL indexes

	1999-2012			1999-2007			2008-2012		
	No change	Increase	Decline	No change	Increase	Decline	No change	Increase	Decline
EPR	Germany, Poland,	Belgium, Denmark, France, United Kingdom	Austria, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Netherlands, Portugal, Slovakia, Spain, Sweden	Denmark, Germany, Greece, Hungary, Italy, Netherlands, Poland, Spain	Belgium, France United Kingdom	Austria, Czech Republic, Finland, Ireland, Portugal, Slovakia, Sweden		Denmark, Ireland	Czech Republic, France, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Slovakia, Spain, United Kingdom
EPC	Austria, Belgium, Czech Republic, France, Germany, Greece, Sweden, United Kingdom	Hungary, Ireland, and Netherlands	Denmark, Finland, Italy, Poland, Portugal, Slovakia, Spain	Austria, Belgium, Czech Republic, France, Germany, Greece, Hungary, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom	Ireland	Denmark, Finland, Poland, Slovakia	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Poland, Portugal, Sweden, United Kingdom	Hungary, Netherlands	Italy, Slovakia, Spain
EPT	Austria, Belgium, Denmark, Finland, France, Netherlands	Czech Republic, Hungary, Ireland, Poland, Slovakia, United Kingdom	Germany, Greece, Italy, Portugal, Spain, Sweden	Austria, Belgium, Denmark, Finland, France, Netherlands	Czech Republic, Hungary, Ireland, Poland, Slovakia, United Kingdom	Germany, Greece, Italy, Portugal, Spain, Sweden	Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Netherlands, Poland, Sweden, United Kingdom	Czech Republic, Germany, Hungary, Slovakia	Greece, Portugal, Spain,

Source: Our calculations based on OECD

Table 2 shows the changes recorded in the EPL indexes during the three periods. It is difficult to assess whether at the end of each period the labour markets are more or less flexible than in the beginning, because in some countries the change in an index comes with an opposite change in another index, making impossible to evaluate labour markets become more or less flexible. We can only argue that the labour market becomes more flexible when, at least, one EPL index declines and the other indexes remain unchanged; with labour market becoming more rigid when, at least, one EPL index increases and the other indexes remain unchanged.

Following this reasoning, in 1999-2012, labour markets became more flexible in Austria, Finland, Germany, Greece, Italy, Portugal, Spain, and Sweden; and more rigid in Belgium, France, and the United Kingdom. The results differ when the two sub-periods are separately analysed. In 1999-2007, labour markets became more flexible in Austria, Denmark, Finland, Germany, Greece, Italy, Portugal, Spain and Sweden; and more rigid in Belgium, France, Hungary and the United Kingdom<sup>3</sup>. In contrast, in 2008-2012, labour markets became more flexible in France, Greece, Italy, Portugal, Spain and the United Kingdom; and more rigid in Denmark, Germany and Ireland<sup>4</sup>.

These differences in the macroeconomic outcomes and the conditions regulating the employment protection in both periods, in addition to the differences existing among empirical studies above showed, reinforce the need to analyse both periods separately.

### ***Empirical Estimation***

Our estimations use a panel data model with random effects. The use of random effects is justified by three reasons: the small number of years in relation to the number of cross-sections; because in some countries the change in some EPL indexes is zero; and the use of dummies to collect the impact of outliers.

The Lagrange multiplier (LM) test reports the existence of cross-section effects. Consequently, our estimations include cross-section effects. European economies are

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<sup>3</sup> Netherlands recorded no change in any EPL.

<sup>4</sup> Austria, Finland, Poland, and Sweden recorded no change in the EPL indexes. Belgium recorded two contrary but equivalent changes in absolute terms in the EPR index.

highly interrelated; therefore, they may be affected by common shocks, such as the Global Financial Crisis and the subsequent Great Recession. The Pesaran CD cross-section dependence panel test shows the existence of cross-section dependence. Therefore, we apply SUR estimators to correct the contemporaneous correlation between cross-sections.

We include in the models four dummies that represent outliers. These outliers are the two highest and lowest residuals among those that are higher than 2 standard deviations. With this procedure, we seek to check whether the results obtained are affected by the sample of countries and years analysed. By including the dummies and testing separately the effects of the GDP and GFCF growth, we check the robustness of results about the significance of the effects of employment protection on labour markets. A significant impact is robust when this effect is not affected by the choice of the economic variable related to the economic fluctuations (GDP-GFCF) or the dummies for extreme residuals.

Table 3 reports the results of the estimations of the determinants of the growth rate of employment and the growth of unemployment rates in 1999-2012. Regarding the determinants of employment growth (columns 1-4), the GDP and the GFCF growth have a direct significant impact on employment growth. The explanatory capacity of both models, measured by the  $R^2$  coefficient, is very similar (slightly higher for GFCF). Regarding the growth of working age population it also has a direct impact on employment growth.

Table 3. Determinants of the growth rate of employment and growth of unemployment rates (1999-2012)

	Growth rate of employment				Growth of unemployment rate			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-1.165 (0.079)	-0.873 (0.230)	-0.617 (0.311)	-0.355 (0.595)	1.024 (0.004)	1.136 (0.004)	0.609 (0.066)	0.605 (0.037)
GDP	0.431 (0.000)	0.410 (0.000)			-0.311 (0.000)	-0.293 (0.000)		
GFCF			0.188 (0.000)	0.171 (0.000)			-0.143 (0.000)	-0.142 (0.000)
POP 15-64	0.822 (0.000)	0.802 (0.000)	0.884 (0.000)	0.864 (0.000)	0.158 (0.272)	0.093 (0.422)	0.091 (0.453)	0.112 (0.244)
EPR	0.015 (0.930)	-0.097 (0.541)	0.064 (0.687)	-0.023 (0.894)	-0.063 (0.509)	-0.080 (0.419)	-0.088 (0.356)	-0.084 (0.300)
ΔEPR	-0.179 (0.861)	-0.042 (0.966)	-0.139 (0.909)	0.115 (0.922)	-0.245 (0.763)	-0.125 (0.876)	0.005 (0.995)	-0.182 (0.827)
ΔEPR-1	1.193 (0.275)	1.277 (0.241)	0.411 (0.755)	0.715 (0.585)	-1.206 (0.164)	-1.116 (0.195)	-1.041 (0.547)	-0.644 (0.483)
EPC	-0.015 (0.900)	-0.032 (0.804)	0.021 (0.870)	0.001 (0.992)	-0.004 (0.943)	-0.031 (0.653)	-0.016 (0.856)	-0.029 (0.625)
ΔEPC	1.101 (0.185)	1.039 (0.149)	0.875 (0.269)	0.825 (0.253)	-0.252 (0.695)	-0.205 (0.707)	-0.021 (0.971)	-0.247 (0.623)
ΔEPC-1	-0.549 (0.515)	-0.647 (0.390)	-0.178 (0.832)	-0.299 (0.700)	0.522 (0.435)	0.607 (0.275)	1.022 (0.640)	0.277 (0.633)
EPT	0.352 (0.017)	0.415 (0.009)	0.239 (0.099)	0.280 (0.087)	-0.097 (0.298)	-0.101 (0.313)	-0.032 (0.742)	-0.033 (0.659)
ΔEPT	-0.031 (0.942)	0.026 (0.950)	0.285 (0.548)	0.291 (0.522)	-0.057 (0.863)	-0.110 (0.735)	-0.331 (0.353)	-0.4701 (0.200)
ΔEPT-1	0.066 (0.874)	0.076 (0.845)	0.235 (0.608)	0.252 (0.565)	-0.264 (0.410)	-0.318 (0.314)	-0.393 (0.250)	-0.392 (0.224)
Germany 2009		2.893 (0.003)						
Greece 2005								-2.497 (0.066)
Ireland 2009		-5.528 (0.000)		-5.477 (0.001)				
Poland 1999						3.517 (0.011)		3.824 (0.003)
Poland 2006						-3.148 (0.022)		
Poland 2007						-3.148 (0.023)		
Slovakia 2003								-2.358 (0.128)
Spain 2000				2.772 (0.066)				
Spain 2009		-5.771 (0.002)		-4.746 (0.003)		4.928 (0.000)		3.967 (0.001)
Sweden 2001		3.602 (0.003)		3.276 (0.000)				
R <sup>2</sup>	0.557	0.634	0.599	0.659	0.457	0.585	0.552	0.638

p-values in parentheses

Employment protection for permanent workers has no impact on employment growth. Therefore, the differences in the employment creation are not explained by the differences in the levels of protection of permanent workers or the reforms that facilitated the dismissals of these workers. This is not the case of the EPT index. The (current and lagged) changes in this index do not have a significant impact on employment growth.

Therefore, the reforms that facilitated the hiring of temporary workers did not have a significant impact on employment. However, the EPT index has a direct significant impact: the countries with stricter constraints to the use of temporary workers record a higher employment growth. We must note that these results are not affected by the choice of the GDP or GFCF growth or inclusion of dummies for outliers, which confirms the robustness of the results.

Columns 5-8 show the estimations of the determinants of the growth of unemployment rates. GDP and GFCF growth have an inverse impact on the growth of unemployment rates. Therefore, the economic growth generates a decline in unemployment rates. As in the case of employment, the explanatory capacity of both models is very similar. In contrast to employment, the growth of working age population is not a significant determinant of unemployment rates. This implies that the increase in working age population came with a similar increase in unemployment and working population, what maintained the unemployment rate unchanged.

Regarding the employment protection, it does not have any significant impact on the growth of unemployment rates. Therefore, a high or low flexibility in the hiring-firing of permanent and temporary workers (the higher or lower EPL indexes), and the reforms in the employment protection of workers, do not explain the changes in unemployment rates.

Table 5. Determinants of the growth rate of employment and growth of unemployment rates 1999-2007, 2008-2012

	Employment growth rates								Growth of unemployment rates							
	1999-2007				2008-2012				1999-2007				2008-2012			
Constant	-0.057 (0.962)	-0.968 (0.140)	1.655 (0.196)	0.249 (0.723)	-1.920 (0.388)	-1.248 (0.111)	-1.355 (0.214)	-1.155 (0.057)	0.541 (0.154)	0.698 (0.088)	-0.264 (0.452)	-0.272 (0.406)	1.444 (0.320)	0.994 (0.232)	1.022 (0.164)	0.899 (0.059)
GDP	0.495 (0.000)	0.466 (0.000)			0.362 (0.000)	0.315 (0.001)			-0.335 (0.000)	-0.297 (0.000)			-0.293 (0.000)	-0.241 (0.000)		
GFCF			0.147 (0.000)	0.150 (0.000)			0.189 (0.000)	0.175 (0.000)			-0.122 (0.000)	-0.114 (0.000)			-0.149 (0.000)	-0.210 (0.000)
POP 15-64	0.304 (0.058)	0.527 (0.000)	0.342 (0.075)	0.615 (0.000)	1.239 (0.012)	0.988 (0.001)	1.128 (0.001)	1.032 (0.000)	0.406 (0.001)	0.304 (0.003)	0.301 (0.006)	0.281 (0.003)	-0.306 (0.335)	-0.096 (0.656)	-0.245 (0.318)	-0.210 (0.159)
EPR	-0.376 (0.173)	-0.232 (0.102)	-0.529 (0.041)	-0.276 (0.102)	0.458 (0.352)	0.198 (0.306)	0.392 (0.096)	0.239 (0.126)	0.194 (0.018)	0.150 (0.095)	0.208 (0.012)	0.199 (0.014)	-0.392 (0.287)	-0.134 (0.354)	-0.338 (0.078)	-0.201 (0.054)
ΔEPR	-0.474 (0.821)	0.835 (0.609)	-1.437 (0.530)	-1.053 (0.603)	-1.991 (0.183)	-1.059 (0.420)	-1.308 (0.409)	-1.001 (0.476)	-0.258 (0.805)	-0.170 (0.873)	1.081 (0.317)	1.001 (0.278)	1.397 (0.275)	1.022 (0.171)	1.053 (0.429)	1.214 (0.150)
ΔEPR-1	-2.320 (0.279)	-1.061 (0.537)	-1.409 (0.546)	-0.884 (0.660)	0.484 (0.733)	2.376 (0.186)	-0.450 (0.796)	0.278 (0.861)	1.922 (0.215)	1.246 (0.258)	1.090 (0.350)	1.052 (0.271)	-0.487 (0.713)	-1.741 (0.020)	0.416 (0.775)	0.121 (0.900)
EPC	-0.138 (0.589)	0.087 (0.484)	-0.202 (0.467)	0.050 (0.732)	0.137 (0.523)	0.191 (0.167)	0.118 (0.533)	0.195 (0.260)	0.032 (0.649)	-0.025 (0.697)	0.047 (0.600)	0.035 (0.685)	-0.098 (0.578)	-0.121 (0.441)	-0.083 (0.518)	-0.152 (0.294)
ΔEPC	0.721 (0.263)	0.949 (0.148)	0.122 (0.870)	0.511 (0.514)	1.089 (0.632)	2.369 (0.138)	2.919 (0.143)	3.503 (0.001)	0.057 (0.925)	0.157 (0.751)	0.534 (0.341)	0.516 (0.191)	-0.656 (0.714)	-1.781 (0.153)	-2.033 (0.226)	-2.576 (0.036)
ΔEPC-1	0.280 (0.795)	0.478 (0.668)	0.455 (0.697)	1.035 (0.318)	-3.378 (0.033)	-6.009 (0.138)	-3.039 (0.065)	-2.511 (0.062)	-0.756 (0.438)	0.005 (0.995)	-0.450 (0.634)	-0.385 (0.529)	1.777 (0.089)	1.367 (0.006)	1.815 (0.119)	1.716 (0.006)
EPT	0.540 (0.000)	0.432 (0.000)	0.470 (0.009)	0.360 (0.000)	-0.226 (0.431)	-0.204 (0.196)	-0.077 (0.527)	-0.023 (0.806)	-0.284 (0.000)	-0.227 (0.000)	-0.183 (0.051)	-0.157 (0.085)	0.381 (0.033)	0.174 (0.046)	0.254 (0.012)	0.227 (0.009)
ΔEPT	0.076 (0.816)	-0.143 (0.609)	0.348 (0.385)	0.192 (0.605)	-0.226 (0.431)	2.321 (0.323)	2.711 (0.413)	4.633 (0.049)	-0.156 (0.598)	-0.127 (0.576)	-0.359 (0.296)	-0.330 (0.334)	-0.095 (0.975)	-2.765 (0.142)	-1.158 (0.698)	-2.616 (0.171)
ΔEPT-1	0.028 (0.930)	-0.029 (0.937)	0.094 (0.807)	0.063 (0.871)	1.545 (0.122)	1.661 (0.129)	2.438 (0.041)	2.377 (0.002)	-0.287 (0.308)	-0.299 (0.169)	-0.327 (0.309)	-0.331 (0.353)	-0.698 (0.399)	-0.404 (0.460)	-1.494 (0.117)	-1.400 (0.012)
Austria 2004		-4.030 (0.000)		-3.731 (0.002)												
Greece 2008																-2.187 (0.100)
Greece 2012														4.004 (0.000)		
Ireland 1999				3.415 (0.005)												
Ireland 2009						-6.414 (0.000)		-5.510 (0.005)						3.816 (0.000)		3.082 (0.008)
Ireland 2010						-4.095 (0.003)										
Poland 1999				-3.597 (0.003)						-0.348 (0.349)		3.720 (0.000)				
Poland 2000		-4.202 (0.052)								2.659 (0.075)		2.361 (0.004)				
Poland 2006										-2.996 (0.043)		-2.333 (0.006)				
Poland 2007										-2.879 (0.047)						
Poland 2008						-3.730 (0.422)										



Slovakia 2006												-2.367 (0.059)				
Slovakia 2010								-4.293 (0.000)						3.546 (0.000)		3.615 (0.000)
Spain 1999		2.615 (0.067)														
Spain 2009						-5.043 (0.000)		-4.157 (0.002)						4.619 (0.006)		3.618 (0.009)
Sweden 2001		3.984 (0.000)		3.246 (0.007)												
R <sup>2</sup>	0.409	0.567	0.377	0.573	0.480	0.666	0.602	0.757	0.381	0.504	0.420	0.585	0.474	0.743	0.615	0.801

p-values in parentheses

Next, we analyse the determinants of the growth of employment and unemployment rates for the sub-periods 1999-2007 and 2008-2012 separately (Table 4).

Regarding the determinants of the growth rate of employment, in both periods the growth of the GDP and GFCF has a significant direct impact on employment growth. Nonetheless, there are differences in the impact of these variables on employment. Although the coefficients of the GFCF growth are similar in both periods, the coefficients of the GDP growth in 2008-2012 are much lower than in 1999-2007.

This result is contrary to studies, like Claessens and Kose (2013), and Tola and Waelti (2018), which argue that financial crises have deeper and longer-lasting effects on employment and unemployment than normal downturns. Our results show a larger impact of GDP growth on employment growth in 1999-2007 than in 2008-2012. Therefore, the Global Financial Crisis *per se* did not have a deeper impact on employment than a normal downturn; the impact came from the larger length and depth of the Great Recession.

In both periods, the impact of the working age population is significant and direct, with the growth of working age population leading to a higher growth rate of employment.

We must highlight two differences between both periods. First, our model explain better the evolution of employment during the Great Recession than in 1999-2007. Second, although in 1999-2007 the explanatory capacity of the models using GDP and GFCF is similar, in 2008-2012, the  $R^2$  coefficient is significantly higher in the equations that use the GFCF growth. This result supports the Keynesian arguments in favour of productive investment as the key determinant of the evolution of employment, at least during a recession.

In 1999-2007, the EPT index had a significant direct impact on employment growth: countries with stricter constraints in using temporary employment contracts recorded a larger creation of employment. This is a robust result, since it is not affected by the use of GDP or GFCF growth or the inclusion of dummies for outliers.

The EPR index has a significant inverse impact on employment growth. This result implies that employment protection for permanent workers against individual dismissal had a negative impact on employment creation: countries with flexible labour markets (low EPR indexes) had a larger employment creation than countries with rigid labour markets (high EPR indexes).

Nonetheless, this result is not robust. The coefficient is only significant when GFCF growth is used as explanatory variable and dummies for outliers are not included. Therefore, the conclusions about the impact of the index EPR depend on the variable representing economic fluctuations, and the sample of observations (countries-years).

The role of EPL as determinant of the employment growth in 2008-2012 is markedly different. The EPT index is not significant. Moreover, the EPR index has a significant direct impact on employment growth: during the Great Recession, the countries with a high protection of regular workers against individual dismissals recorded a smaller decline in employment. Nonetheless, the result is not robust: it only happens when GFCF growth is used as explanatory variable and dummies for extreme residuals are not included.

Although, as we saw above, in 2008-2012 there was an increase in the frequency and depth of the reforms in the protection of permanent workers against individual dismissals, the changes in the EPR index did not have an impact on employment. By contrast, the changes in the EPC and the EPT indexes did have a significant direct impact on employment growth (implying that the measures that made the labour market more flexible contributed to speed up the process of destruction of employment). However, this result is not robust, because it depends on the use of GFCF growth as explanatory variable. Furthermore, in the case of the EPC index, this effect only happens when dummies for extreme observations are included.

Results differ for the lagged changes in EPC and EPT indexes. Lagged changes in the EPC index have a significant inverse impact on employment growth, implying that the approval of measures facilitating collective dismissals have a lagged positive impact on employment creation. However, lagged changes in EPT index have a significant direct impact, implying that the reforms liberalizing the use of temporary contracts had a

negative impact on employment creation. These results imply the existence of lags between the time when these measures are approved, and being in force, and the time when employers make a decision about the effective use of these new regulations.

Seemingly, these results are in accordance with the studies that conclude the effects of employment protection reforms for regular and temporary contracts differ depending on the phase of the business cycle. For Duval et al. (2019) the reforms making more flexible the hiring of temporary workers increase employment during strong economic conditions, but reduce employment during downturns. However, our results show that these reforms had no impact on employment in 1999-2007, a period of strong economic growth. Nonetheless, the low mean value of these changes makes that the impact on employment is close to zero.

Next, we focus on the determinants of the evolution of unemployment rates in 1999-2007 and 2008-2012. Before the Global Financial Crisis, GDP and GFCF growth were a significant determinant of the evolution of unemployment rates, with economic growth leading to lower unemployment rates. The growth of working age population had a significant direct impact on unemployment rates. The increase in population had a positive impact on employment creation, but it was not high enough to absorb the larger labour supply, hence the increase in the unemployment rates.

Regarding the role played by employment protection legislation in the evolution of unemployment rates, the EPC index and the changes in the three EPL indexes did not have a significant impact on unemployment rates.

By contrast, the EPR and the EPT indexes have a significant and robust impact on unemployment rates, but the sign of the coefficients differs. The coefficient of the EPR index is positive. This implies that countries with a high protection of permanent workers against individual dismissal recorded a smaller decline in the unemployment rates. It could be argued that the protection for permanent workers against dismissal contributed to discourage the hiring of new workers, thus hindering the absorption of the rising labour supply.

However, the EPT index had a robust significant inverse impact on the growth of unemployment rates. Countries with stricter regulation in using temporary contracts (higher EPT index) recorded a larger decline in unemployment rates. This results is coherent with the impact of EPT on employment in this period: stronger constraints to the use of temporary workers are associated to a strong employment growth and to a large decline in unemployment rates.

However, the results for the period 2008-2012 are different. Again, as happened in the case of the growth of employment, the explanatory capacity of our model is larger in this period. The GDP and GFCF growth maintain their inverse significant impact on unemployment rates. As in the case of employment, the explanatory capacity of the models using the GFCF is larger than those using GDP growth. This supports the Keynesian arguments in favour of the use of productive investment as a determinant of the labour market performance, at least during recessions.

In contrast to the period 1999-2007, population dynamics did not have a significant impact on unemployment because of the zero growth of the working age population.

Nevertheless, there are relevant differences in the impact of EPL on unemployment rates. In contrast to the previous period, during the Great Recession, the EPR index had a significant inverse impact on unemployment rates; therefore, the increase in unemployment rates was smaller in the countries with strong protection for permanent workers. This result supports the argument that during downturns a strong protection against dismissals discourages firing of permanent workers and contributes to a smoother evolution of unemployment. Nonetheless, this result is not robust because it does not happen when GDP growth is the explanatory variable.

Although the level and current change of the EPC index is not significant, its lagged change had a significant direct impact on unemployment rates. The reforms facilitating the collective dismissals of permanent workers led to smaller increases in unemployment rates. This result seems to be robust, although when we use the GFCF growth, the effect is only significant when dummies for outliers are included. Nonetheless, the low mean value of this variable implies that its impact on unemployment rates is close to zero.

The labour reforms affecting the EPR and EPT indexes did not have a significant impact on unemployment. Lagged changes in these indexes seem to have a significant impact, but this result is not robust: in the lagged change of the EPR, it only happens when we use the GDP growth and dummies for extreme residuals; and in the lagged change in the EPT when we use the GFCF growth and dummies. Nonetheless, in both cases the sign of the coefficient is negative, implying that reforms contributed to increase the on unemployment rates.

The EPT index had a significant and robust direct impact on unemployment rates. During the Great Recession, the rise in unemployment rates was higher in the countries with stronger constraints in the use of temporary employment contracts. A possible reason is the reluctance of companies to hire workers on a permanent contract during downturns, mainly in a prolonged and severe economic crisis resulting from the financial crisis. In this environment, companies may prefer to hire workers on a temporary basis. Strong constraints to the use of temporary workers can, therefore, affect negatively employment (although this is not proved by our previous analysis of employment determinants), and thus contribute to rise unemployment rates.

## **Summary and Conclusions**

The results of our analysis show that the employment protection legislation does not explain the dynamics of employment and unemployment rates in the European Union countries during the period 1999-2012. The employment protection for permanent workers and the reforms of the employment protection for temporary and permanent workers do not have a significant impact on the evolution of the employment and unemployment rates. The only exception is the EPT index. However, contrary to the arguments from the mainstream and to recommendations from international institutions, a high flexibility in the hiring of temporary workers is associated with a smaller employment growth.

The OECD (2018) argues that reforms that liberalise the use of temporary contracts, but maintain a high protection for permanent workers, can be counterproductive. However, our analysis does not support this argument; the employment protection for permanent workers is not a determinant of the changes in unemployment rates, whereas strong

constraints in the use of temporary workers have a positive impact on employment growth. Consequently, reforms reducing the employment protection for permanent workers are not empirically justified.

The results change when we analyse separately the periods 1999-2007 and 2008-2012. The period 1999-2007 was a period of economic growth, whilst the period 2008-2012 was characterized by a situation of recession and stagnation. Therefore, it seems that the effects of employment protection legislation on labour markets differ depending on the phase of the business cycle, and probably on the nature and origin of the downturn.

In the case of the employment growth, although in 1999-2007 the EPT index has a direct impact, this effect vanishes in 2008-2012. During the latter period, the lagged reforms in the protection of permanent workers against collective dismissals, and the reforms in the constraints of using temporary workers have a significant impact on employment growth. However, the effects operate in different directions and their overall effect is very small. Moreover, the results are not robust because their significance changes with the variable representing the economic dynamics (GDP vs GFCF) and the inclusion of dummies for the extreme residuals.

A similar conclusion emerges when we analyse the dynamics of the unemployment rates. In 1999-2007, the levels (not the reforms) of protection for permanent workers against individual dismissals and the constraints of using temporary contracts have a significant, but opposite impact on unemployment rates. High levels of EPR index imply smaller declines in unemployment rates, whereas high levels of EPT index imply stronger declines in unemployment rates. However, these effects change dramatically in 2008-2012; a high protection for permanent workers against individual dismissals leads to smaller increases in unemployment rates, whereas high rigidity in the hiring of temporary workers leads to larger increases in unemployment rates. In this period, some reforms in EPL indexes affected the evolution of unemployment rates, but these effects are not robust because their significance changes with the choice of GDP or GFCF, and the inclusion of dummies for extreme residuals.

In sum, our results prove that the evolution of employment and unemployment rates is not affected by the employment protection legislation. We cannot argue that the countries

with flexible labour markets show the best results in employment creation or evolution of unemployment rates, and vice versa. Moreover, the legal reforms approved to make labour market more flexible do not have the expected positive impact on employment and unemployment rates.

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