



## Employment protection, employment and unemployment rates in European Union countries during the Great Recession

Jesus Ferreiro & Carmen Gomez

To cite this article: Jesus Ferreiro & Carmen Gomez (2021): Employment protection, employment and unemployment rates in European Union countries during the Great Recession, Journal of Economic Policy Reform, DOI: [10.1080/17487870.2020.1855175](https://doi.org/10.1080/17487870.2020.1855175)

To link to this article: <https://doi.org/10.1080/17487870.2020.1855175>



Published online: 21 Jan 2021.



Submit your article to this journal [↗](#)





View related articles [↗](#)



View Crossmark data [↗](#)



# Employment protection, employment and unemployment rates in European Union countries during the Great Recession

Jesus Ferreiro  and Carmen Gomez 

Department of Public Policies and Economic History, University of the Basque Country UPV/EHU, Bilbao, Spain

## ABSTRACT

This paper analyses the impact of employment protection legislation on the evolution of employment and unemployment in European Union economies during the Great Recession. The results show that employment protection did not have a significant impact on employment growth. Regarding unemployment rates, we obtain contrasting results: high employment protection for temporary workers was associated with larger increases in unemployment rates, whereas high protection for permanent workers against individual dismissal was associated with lower increases in unemployment rates. Nonetheless, employment protection for permanent in conjunction with that for temporary workers had a positive impact on unemployment rates.

## ARTICLE HISTORY

Received 21 February 2019  
Accepted 20 November 2020

## KEYWORDS

Employment;  
unemployment; Great  
Recession; employment  
protection

## JEL CLASSIFICATION

E24; J88

## 1. Introduction

The huge impact on the economic activity of the Global Financial Crisis (GFC) and the subsequent Great Recession generated a widespread increase in unemployment rates in the European Union (EU). In addition to the decline in economic activity, the negative results in employment and unemployment were attributed to certain labour institutions that have a negative influence on the resilience of labour markets facing severe economic shocks (Boeri and Jimeno 2016). Thus, some studies argued, first, that most negative labour market results occurred in the countries with an excessive employment protection, and, second, that the sensitivity of employment and unemployment to (strong) economic fluctuations was higher in countries characterized by a less protection for temporary workers than for permanent workers (Bertola 2017a; OECD 2012, 2017).

Following these arguments, during the Great Recession, many European countries approved different measures to make their labour markets more flexible. Among these measures, the reforms reducing the employment protection, mainly for permanent workers, stand out (Clasen, Clegg, and Kvist 2012; Clauwert and Schömann 2012).

Since the seminal paper by Blanchard and Wolfers (2000), many studies have analysed the impact of employment protection legislation (EPL) on employment and unemployment rates. However, the empirical evidence about this impact is not conclusive.

Although some recent studies argue that the long-term effects of EPL on employment and unemployment are non-existent, they agree that this impact can occur in the short term, although it would differ depending on the phase of the business cycle (Boeri and Jimeno 2016; De Almeida and Balasundharam 2018; Duval and Furceri 2018; Duval, Furceri, and Valles 2017; OECD 2012, 2017).

Our paper analyses the effects of EPL on the evolution of employment and unemployment rates in 21 EU countries during the years 2008 to 2012. In this period, EU countries recorded large differences in the evolution of employment and unemployment: employment growth rate ranged from  $-18.8\%$  (Greece) to  $+15.3\%$  (Luxembourg), whereas the growth of unemployment rates ranged from  $-3.1$  percentage points (Germany) to  $+16.6$  percentage points (Spain). Although these variations can be related to the national differences in the size and length of the recession, countries with a similar evolution of economic activity recorded significant differences in the labour market performance. Hence, the need to study whether the impact of the Great Recession on European labour markets is related to the national differences concerning employment protection legislation.

Our paper analyses the impact of employment protection on the growth of employment and unemployment rates. Therefore, we test the hypothesis that the evolution of employment and unemployment rates is the result of the interactions between economic shocks and the labour market rigidities generated by employment protection legislation.

The paper is structured as follows. The first section reviews the literature about the impact of labour institutions on employment and unemployment. The second section focuses on the effects of EPL. In the third section, we conduct a descriptive analysis of the behaviour of employment, unemployment rates and employment protection in the European Union in 2008–2012. The fourth and fifth sections present, respectively, the model and data used in the analysis and the results of the empirical analysis. The final section summarizes and concludes.

## 2. Labour institutions and labour market performance

Since Friedman (1968) claimed the existence of a natural unemployment rate, economists have devoted special attention to the impact of labour market institutions on employment and unemployment (Ball 2009). For Friedman, the natural unemployment rate is a long-term equilibrium rate determined by structural-institutional elements that prevent the rapid adjustment of salaries in response to changes in labour demand and supply. Without changes in these structural elements, the natural unemployment rate remains stable, and the current unemployment rate temporarily deviates from the equilibrium rate as a result of demand shocks.

This view was adopted by New Keynesian economics under the concept of the Non-Accelerating Inflation Rate of Unemployment (NAIRU). NAIRU is determined by the imperfections of labour market that cause sluggish adjustments in nominal and real wages in the presence of economic shocks, and it is not affected by temporary aggregate demand shocks (Jump and Stockhammer 2019). Although for some New Keynesian economists the NAIRU can be influenced by the path of current unemployment, and consequently, by demand-side shocks (Ball 2009; Blanchard and Summers 1986), in this

approach the rigidities generated by labour market institutions remain a key determinant of high and persistent unemployment rates. These institutions affect the labour market through different channels: the wage-setting processes, the insider-outsider mechanism, the skill-loss of long-term unemployed workers, the adaptation of companies' workforce to shifts in demand, the innovation activities, and the job search by unemployed workers. The dynamics of unemployment would be explained by the interaction of economic shocks with labour market institutions. Adverse labour institutions increase the impact of negative shocks on current unemployment, accentuating hysteresis effects by rising long-term unemployment, and, consequently, rising NAIRU (Blanchard and Wolfers 2000).

From this perspective, the resilience of the labour market depends on the labour market institutions in force (OECD 2017). Adverse shocks generate smaller rises in unemployment rates in countries with flexible labour markets. The policy corollary is obvious: labour market flexibilization is a necessary condition to achieve low and stable unemployment rates.

Following these recommendations, since the 1980s many countries have approved reforms to enhance labour market flexibility acting on unemployment protection schemes, collective bargaining or employment protection legislation (Brancaccio, Garbellini, and Giammetti 2018; Tridico and Pariboni 2017). However, empirical studies are not conclusive and have not conclusively proved that these reforms had a positive impact on labour markets (Avdagic and Salardi 2013; Bertola 2017b).

In this sense, non-mainstream approaches question the belief that labour market institutions are the main determinants of employment and unemployment (Howell 2011; Stockhammer 2011). For Keynesian economists, changes in aggregate demand are the main determinants of unemployment rates. To reduce unemployment rate, they stand up for expansionary demand-side policies that stimulate productive investment (Jump and Stockhammer 2019). This recommendation is shared by some mainstream economists, such as Ball (2009, 2014) and Blanchard and Summers (2017), who argue that the rise of structural unemployment recorded since the eighties in many European countries was generated by the implementation of restrictive demand-side policies.

We must note that some studies argue that labour market institutions have positive micro and macroeconomic effects: among others, lower unemployment, lower economic volatility, higher employment, more egalitarian functional and personal income distribution, higher accumulation of human and physical capital, and promotion of innovative activities (Brancaccio, Garbellini, and Giammetti 2018; Ciminelli, Duval, and Furceri 2018; Dosi et al. 2017, 2018; European Commission Directorate-General for Employment, Social Affairs and Inclusion 2015; Flaschel et al. 2012; Liotti and Canale 2020).

### **3. Employment protection and labour market performance**

New Keynesian economics has paid special attention to the impact on labour market of the legal measures governing the hiring and dismissal of workers, usually known as employment protection legislation (EPL). EPL is the legal constraints that affect the capacity of employers to hire or fire workers and to hire workers using different types of

employment 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 dismissing (permanent) workers and in hiring workers using temporary contracts. In this approach, high firing costs and strict regulation on the use of certain employment contracts cause rigidities in the labour market, leading to high unemployment.

Since the eighties, many countries have approved labour reforms to reduce firing costs and restrictions on the use of non-standard employment contracts (fixed-term, agency workers and part-time contracts). In many cases, the removal of restrictions on the use of temporary contracts came with lower compensations for the extinction of these contracts (compared with those for permanent contracts), causing a segmented labour market with a rising share of atypical employment contracts (Ferreiro and Gomez 2017).

Despite the generalization of these reforms, there is not an unambiguous empirical evidence supporting their positive effect on labour market performance. For Blanchard and Wolfers (2000), the reforms that some European countries approved during the oil crises to rise the employment protection generated a disincentive to hiring new workers (and to capital accumulation and productivity growth) resulting in higher structural unemployment. This reasoning was accepted by many international organizations, which recommended reducing employment protection, mainly for permanent workers, to reduce unemployment rates (European Commission 2012; OECD 2012, 2017). However, the empirical evidence about the impact of high employment protection on unemployment is not conclusive (Bertola 2017a; Boeri, Cahuc, and Zylberberg 2015; Ferreiro and Gomez 2020; Heyes and Lewis 2015; Myant and Brandhuber 2016). Many studies conclude that high employment protection has no negative impact on unemployment (Avdagic 2015; Avdagic and Salardi 2013; Bertola 2017a; Flaschel et al. 2012) and, consequently, that labour market flexibilization has not reduced unemployment rates.

Furthermore, some studies conclude that the decline of employment protection has generated adverse micro and macroeconomic consequences: lower innovation, capital accumulation, productivity and human capital accumulation (Damiani, Pompei, and Ricci 2016; Heyes and Lewis 2015), higher labour segmentation and precarious employment (Arestis, Ferreiro, and Gomez 2020a; Gutierrez-Barbarrusa 2016; Heyes and Lewis 2015; Rubery and Piasna 2016), higher poverty and income inequality (Arestis, Ferreiro, and Gomez 2020b; Brancaccio, Garbellini, and Giammetti 2018), and higher household borrowing (Ferreiro and Gomez 2015). Indeed, since 2008, some European countries have passed measures to reduce the excessive labour segmentation, increasing employment protection for temporary workers, although in many cases these measures came with less protection for permanent workers (Ferreiro and Gomez 2017).

We must highlight that what some mainstream economists actually claim is that it is likely that the higher employment protection enacted in the seventies increased NAIRU (Blanchard 2017). The uncertainty about the effect on aggregate employment or unemployment could be explained because the EPL on certain groups of workers differ depending on factors such as gender, age, skills, or type of employment contract (Boeri, Cahuc, and Zylberberg 2015; Gal and Theising 2015).

Recent studies focusing on European labour market performances since 2008 reinforce the doubts about the effects of EPL. For Boeri and Jimeno (2016), the largest increases in unemployment took place in countries with high labour flexibility and

segmentation. For Sharma and Winkler (2018), high employment protection for permanent workers had a negative impact on aggregate employment, mainly on temporary, young and low-skilled workers. Similarly, for Anderton et al. (2012), a high employment protection for permanent workers increased structural unemployment rates. However, for Stockhammer, Guschanski, and Köhler (2014), EPL did not affect unemployment rates in OECD countries. Similarly, Blanchard (2017), replicating the paper by Blanchard and Wolfers (2000), concludes that EPL is not a significant determinant of unemployment.

#### 4. Employment, unemployment rates and employment protection legislation in the European Union countries during the Great Recession

The Global Financial Crisis and the subsequent Great Recession had a huge impact on European labour markets. Between 2008 and 2012, employment declined in 13 countries, and unemployment rates climbed in all countries except for Austria and Germany (Table 1). Labour market performance in European countries in this period is not explained by previous performance, given the low (0.11) correlation between the unemployment rate in 2007 and the growth of unemployment rates between 2008 and 2012. Consequently, other elements must explain the impact of the Great Recession on European labour markets.

On the contrary, there is a high correlation between GDP growth and employment growth (0.58), and between GDP growth and growth of unemployment rates (−0.70). This result implies the best labour market performance during the Great Recession took place in countries with the best economic activity performance, and vice versa. However,

**Table 1.** Growth of GDP, employment and unemployment rates between 2008 and 2012.

	GDP growth (%)	Employment growth (%)	Unemployment rate growth (p.p.)	Unemployment rates in 2007 (%)
Belgium (BE)	3.1	3.0	0.1	7.5
Czech Republic (CZ)	0.9	−1.0	1.7	5.3
Denmark (DK)	−2.1	−5.0	3.7	3.8
Germany (GE)	3.4	2.5	−3.1	8.5
Estonia (EE)	−7.4	−6.5	5.4	4.6
Ireland (IE)	−3.9	−14.7	10.0	4.7
Greece (GR)	−24.1	−18.8	16.1	8.4
Spain (ES)	−6.3	−14.5	16.6	8.2
France (FR)	1.4	0.4	1.8	8.0
Italy (IT)	−7.1	−1.6	4.6	6.1
Luxembourg (LUX)	1.2	15.3	0.9	4.2
Hungary (HU)	−5.0	−2.0	3.6	7.4
Netherlands (NL)	−0.2	−2.1	1.6	4.2
Austria (AT)	3.0	3.9	0.0	4.9
Poland (PL)	18.5	2.3	0.5	9.6
Portugal (PT)	−6.7	−10.5	6.7	9.1
Slovenia (SL)	−5.5	−5.3	4.0	4.9
Slovakia (SK)	9.7	−1.4	2.8	11.2
Finland (FI)	−3.8	−1.1	0.8	6.9
Sweden (SW)	2.3	1.3	1.9	6.1
United Kingdom (UK)	−0.4	0.1	2.6	5.3

Source: Our calculations based on Eurostat.

countries like Luxembourg or Spain can be considered as outliers. These outliers can affect the relationship between GDP growth and changes in employment and unemployment. Hence, the need to include in empirical analyses the potential influence of extreme values. Finally, countries with similar GDP growth show significant differences in the evolution of employment and unemployment rates, implying that GDP growth is not the only determinant of labour market results.

In the paper, we use the Employment Protection Legislation strictness indexes elaborated by the OECD (OECD EPL indexes) to measure the protection for workers against dismissals and the constraints on the use of different employment contracts. EPL indexes are classified by three main areas: (i) protection of regular workers against individual dismissal; (ii) regulation of temporary forms of employment (fixed-term and temporary agency workers); (iii) additional, specific requirements for collective dismissals. Each indicator is measured on a 0-to-6 score, with higher values representing higher protection of regular workers against dismissals and stricter constraints on the use of temporary employment contracts, and vice versa. Measures enhancing labour market flexibility, facilitating the dismissal of regular workers or the hiring of workers using a temporary employment contract, reduce the value of the respective EPL index, and vice versa.<sup>1</sup>

The use of these indexes to measure the true flexibility-rigidity of labour markets, however, is not problem-free, because the nature of the indexes, how they are calculated, and their inability to measure effective employment protection based on legal norms alone (Myant and Brandhuber 2016). Nonetheless, their use in empirical analyses is widespread<sup>2</sup> and due to the common methodology of elaboration, they are useful tools for international comparisons.

OECD calculates two basic indexes: EPRC and EPT indexes. OECD calculates three versions of EPRC index, two versions of EPR index, one version of EPC index, and two versions of EPT index. In the paper, we use the version 3 of EPRC, EPR and EPT indexes.<sup>3</sup> EPRC version 3 is a synthetic indicator based on the values attached to 13 items concerning the regulations for individual dismissals (procedural inconvenience, notice and severance pay for no-fault individual dismissals, and difficulty for dismissals) and the existence of additional requirements for collective dismissals of permanent workers. EPT version 3 is based on the values attached to eight items concerning the use of fixed-term employment contracts (three items) and temporary agency workers (five items). EPRC is split into two indexes: EPR version 3 index (based on nine items related to the protection for permanent workers against individual dismissal), and EPC index (based on four items related to specific additional requirements for collective dismissals of permanent workers).

In sum, the OECD elaborates four indexes of employment protection:

- EPRC: protection of permanent workers against individual and collective dismissals
- EPR: protection for permanent workers against individual dismissals
- EPC: specific requirements for collective dismissals of permanent workers
- EPT: regulation on temporary employment contracts (fixed-term contracts and temporary work agency employment)

Next, we will conduct a descriptive analysis of the relationship between the growth of employment and unemployment rates between 2008 and 2012, the employment



protection for permanent (EPRC index) and temporary (EPT) workers in 2008 and the changes in EPRC and EPT indexes between 2008 and 2012 for the 21 countries analysed in the paper.<sup>4</sup> The analysis, based on the correlations between the aforementioned variables, will give us helpful information to understand whether the evolution of employment and unemployment during the Great Recession was affected by employment protection legislation.

Data of [Table 2](#) show a very low correlation between the growth of employment and unemployment between 2008 and 2012 and the employment protection in 2008. This result implies that labour market results during the Great Recession are not associated with EPL in force before the crisis. A similar conclusion is obtained when we study the relationship between the changes in employment and unemployment rates and the changes in employment protection for permanent and temporary workers. The correlation between the changes in EPT index and the changes in employment and unemployment rates is very low. Nonetheless, in the case of the changes in EPRC index, we find an inverse association with the change in unemployment rates and a positive association with the change in employment. These results are contrary to the argument that the reforms reducing employment protection are associated with better labour market results.

Nonetheless, these conclusions must be taken with caution because EPL indexes did not change in a high number of countries. Between 2008 and 2012, EPRC index remained constant in seven countries (Austria, Belgium, Finland, Germany, Luxembourg, Poland and Sweden), and EPT index in 10 countries (Austria, Belgium, Denmark, Finland, France, Italy, Luxembourg, Netherlands, Poland, and Slovakia).

Although it is not the focus of our paper, we can reflect on the reasons for the change in EPL indexes. Some authors argue that the reforms boosting labour market flexibilization have an endogenous nature, suggesting an inverse causation: countries with the worst results in employment and unemployment are more likely to reducing employment protection (Bertola 2017b; Duval, Furceri, and Miethe 2018). Nonetheless, no conclusive results can be inferred from data in [Table 2](#).

It could also be argued that the changes in employment protection approved since 2008 are related to employment protection in force before the crisis, with countries with higher employment protection before the crisis being more prone to reducing this protection. [Table 2](#) shows a high negative correlation between the values and the changes of the indexes ( $-0.48$  for EPRC index and  $-0.50$  for EPT index). However, we cannot claim that the countries with the most rigid labour markets (the highest EPRC and EPT indexes) in 2008 implemented the most intense reforms to reduce

**Table 2.** Matrix of correlation of employment and unemployment rates growth and EPRC and EPT indexes between 2008 and 2012.

	EPRC2008	EPT2008	$\Delta$ EPRC	$\Delta$ EPT
$\Delta$ Employment	-0.012	0.047	0.488	0.067
$\Delta$ Unemployment rate	0.033	0.268	-0.496	-0.265
EPRC2008			-0.482	
$\Delta$ EPRC				
EPT2008	0.496			-0.507
$\Delta$ EPT			0.133	

Source: Our calculations based on Eurostat and OECD.



employment protection. One reason is that some countries with high employment protection before the crisis (such as France and Luxembourg) did not modify that protection. Moreover, some countries can be considered as outliers. Finally, we must highlight the high number of countries where EPRC and EPT indexes remained unchanged.

Previous conclusions are based on descriptive and partial analyses. However, most empirical and theoretical analysis argue that labour market results can be explained by the interaction between economic growth and labour institutions, hence the need for a multivariate empirical analysis of the determinants of the growth of employment and unemployment rates.

## 5. Model and data

The models we test use OECD EPL indexes and economic growth as determinants of the changes in employment and unemployment rates. We regress two equations, which differ in terms of the dependent variable: the employment growth rate and the growth of unemployment rate:

$$\Delta L_{i,t} = \beta_0 + GDP_{i,t} + \sum_j \gamma_j EPL_{j,i,t} + \sum_j \delta_j \Delta EPL_{j,i,t} + \epsilon_{i,t} \quad (1)$$

$$\Delta U_{i,t} = \beta_0 + GDP_{i,t} + \sum_j \gamma_j EPL_{j,i,t} + \sum_j \delta_j \Delta EPL_{j,i,t} + \epsilon_{i,t} \quad (2)$$

$\Delta L_{i,t}$  and  $\Delta U_{i,t}$  represent, respectively, the employment growth rate and the change in percentage points of unemployment rate in country  $i$  during year  $t$ . The source of these variables is the Labour Force Survey of Eurostat.  $GDP_{i,t}$  measures the real GDP growth rate in country  $i$  during year  $t$ . The source for this variable is the National Accounts of Eurostat.

$EPL_{j,i,t}$  shows for each country  $i$  the value of the  $j$  OECD EPL indexes in year  $t$ .  $\Delta EPL_{j,i,t}$  shows for each year  $t$  the change registered in country  $i$  of EPL indexes. The scores of EPL indexes reflect the employment protection legislation in force on the 1st of January of year  $t$ , and, therefore, incorporate changes in the legislation passed during the year  $t-1$ . The 2013 indexes incorporate changes in the employment protection legislation passed in 2012. Therefore, we analyse the changes in employment and unemployment rates registered between 2008 and 2012.

The simultaneous inclusion in a model of all EPL indexes faces a multicollinearity problem. However, this problem only emerges if EPRC and EPC are included in the same equation given the high correlation between both indexes (0.83). Correlations between the rest of indexes are much lower ( $-0.34$  between EPR and EPC,  $0.28$  between EPR and EPT,  $0.31$  between EPC and EPT, and  $0.48$  between EPRC and EPT).

Correlation between the level and growth of EPL indexes is low:  $-0.21$  for EPRC,  $-0.27$  for EPR,  $-0.22$  for EPC, and  $-0.22$  for EPT. Therefore, to include in the same equation an index measured in levels and changes is not a problem. Furthermore, as OECD states, given that EPC index measures additional costs and procedures involved in dismissing more than one worker at a time compared with the cost of individual dismissal, this index should not be used in isolation from EPR index.

Therefore, we have two options to test the impact of employment protection for permanent and temporary workers on the evolution of employment and unemployment rates. The first option implies the use of the levels and changes of EPRC and EPT indexes. In the second option, we use the levels and changes of EPR, EPC and EPT indexes. This option allows to study separately the impact of protection for permanent workers against individual and collective dismissals.

As explained above, we are testing whether the changes in employment and unemployment rates are affected by economic growth and levels of and changes in EPL indexes. From a mainstream perspective, we should expect that the worst labour market performance is associated with low-negative GDP growth rates, high levels of employment protection, and labour reforms increasing EPL indexes, and vice versa.

Table 3 shows the main descriptive statistics of the variables used in the analysis. We have 105 annual observations: 21 countries for a 5-year period. The mean value of changes in EPL indexes is close to zero, and the median value is zero. These data imply that the number of annual observations recording changes in EPL indexes is very low: 22 observations in EPRC index, 21 in EPR index, 6 in EPC index, and 18 in EPT index.

Table 4 shows the countries that during the years 2008 to 2012 have passed measures to change the employment protection for permanent and temporary workers. Countries have been grouped according to the impact of these measures on EPL indexes. EPRC index did not record any change in six countries, EPR in 6, EPC index in 15, and EPT in 11 countries. In five countries (Austria, Finland, Germany, Luxembourg, and Poland) all EPL indexes remained unchanged.

If we focus on the changes in EPR, EPC and EPT indexes, it is difficult to conclude whether European countries increased or reduced the employment protection for workers during the Great Recession. Opposed measures increasing and reducing protection for permanent workers against individual dismissals were passed in Belgium and Slovakia, whereas conflicting measures concerning the regulation on the use of temporary contracts were passed in Portugal, Slovakia and Spain. Furthermore, most countries record conflicting changes in the three indexes. Therefore, we can only conclude that a country has reduced (increased) employment protection for workers if, at least, one index has declined (increased) while the other indexes have remained unchanged.

Following this approach, employment protection declined in three countries: France, Italy and Slovenia. In these countries, employment protection for permanent workers

**Table 3.** Descriptive statistics.

	Mean	Median	Maximum	Minimum	Standard Deviation
Employment growth rate (%)	-0.561	-0.248	6.436	-9.335	2.581
Growth of unemployment rate (p.p.)	0.783	0.400	8.000	-4.400	1.786
GDP growth rate	-0.273	0.649	7.598	-14.725	3.666
EPRC	2.570	2.635	3.512	1.759	0.380
ΔEPRC	-0.025	0.000	1.136	-0.470	0.089
EPT	2.166	2.167	3.833	0.417	0.899
ΔEPT	0.019	0.000	0.750	-0.333	0.116
EPR	2.331	2.279	4.167	1.312	0.547
ΔEPR	-0.037	0.000	0.190	-0.816	0.136
EPC	3.165	3.250	5.125	1.625	0.792
ΔEPC	0.004	0.000	1.125	-0.375	0.131

Source: Our calculations based on Eurostat and OECD.



**Table 4.** Countries that passed measures changing employment protection for permanent and temporary workers in the period 2008–2012.

	Change in EPL indexes		
	No change	Increase	Decline
EPRC	Austria, Finland, Germany, Luxembourg, Poland, Sweden	Belgium, Denmark, Ireland, Netherlands, Slovakia	Belgium, Czech Republic, Estonia, France, Greece, Hungary, Italy, Netherlands, Portugal, Slovenia, Slovakia, Spain, United Kingdom
EPR	Austria, Finland, Germany, Luxembourg, Poland, Sweden	Belgium, Denmark, Ireland, Slovakia	Belgium, Czech Republic, Estonia, France, Greece, Hungary, Italy, Netherlands, Portugal, Slovenia, Slovakia, Spain, United Kingdom
EPC	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Luxembourg, Poland, Portugal, Slovenia, Sweden, United Kingdom	Estonia, Hungary, Netherlands	Italy, Slovakia, Spain
EPT	Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, Netherlands, Poland, Slovenia	Czech Republic, Estonia, Greece, Hungary, Ireland, Portugal, Slovakia, Spain, Sweden, United Kingdom	Greece, Portugal, Slovakia, Spain

Source: Our calculations based on OECD.

against individual and collective dismissals declined while regulations on the use of temporary contracts remained unchanged. Employment protection increased in Denmark (where protection for permanent workers against individual dismissals increased) and Ireland (where protection for permanent workers against individual dismissals and constraints on the use of temporary contracts increased). The existence of opposed changes in the indexes corresponding to employment protection for permanent and temporary workers reinforces the need to include in the empirical estimations the EPL indexes corresponding to both groups of workers.

The low number of observations recording changes in EPL indexes, and the existence of a number of countries where indexes remained constant, implies that the role played by these changes as determinants of changes in employment and unemployment rates is, at most, minor or secondary. This does not mean that employment protection does not have a significant (economic and/or statistical) impact on labour market performance. This effect could come from the level of employment protection, with changes in employment and unemployment rates being affected by higher or lower employment protection for permanent and/or temporary workers.

## 6. Estimation

Equations are estimated using a panel data model with random effects. The use of random effects is justified for several reasons: first, the small number of years in relation to the number of cross-sections; second, in some countries during the 5 years the change in some indexes is zero; finally, the use of dummies for outliers in order to check the robustness of the results (Kennedy 2008; Wooldridge 2010).<sup>5</sup>

Lagrange multiplier (LM) tests report the existence of cross-section effects. Consequently, our estimation include cross-section effects. Moreover, panel cross-section dependence tests show the existence of cross-section dependence,<sup>6</sup> an expected results because we are dealing with a set of highly integrated economies that suffered a common shock. Therefore, we apply SUR estimators to correct the contemporaneous correlation between cross-sections.

To test the determinants of the growth of employment and unemployment rates, we estimate three models which differ in terms of the explanatory variables: GDP growth rate; GDP growth rate plus levels and growth of EPRC and EPT indexes; and GDP growth rate plus and the levels and growth of EPR, EPC and EPT indexes. Proceeding this way, we can analyse whether the effects on labour market performance of protection of permanent workers against individual dismissal and the protection of permanent workers against collective dismissal are different.

Finally, to check the robustness of our results, we estimate the equations including two dummies that represent the most extreme cases, specifically, the highest and lowest residuals of the models. Thus, we check whether the results obtained are affected by the existence of extreme values, in which the evolution of employment and unemployment would be affected by other elements not included in our model.

Table 5 reports the results of the different estimations of the determinants of employment growth rate. The level and change of EPL indexes are not significant determinants of employment growth. Only GDP growth rate is a significant determinant of employment growth rate, with a GDP growth rate of 1% increasing employment by 0.4%. This

**Table 5.** Determinants of the employment growth rate.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.455 (0.430)	-0.481 (0.363)	-2.633 (0.155)	-2.150 (0.182)	-2.680 (0.182)	-2.082 (0.216)
GDP	0.385 (0.001)	0.398 (0.000)	0.369 (0.002)	0.378 (0.002)	0.346 (0.004)	0.359 (0.002)
EPRC			0.761 (0.185)	0.648 (0.278)		
EPR					0.553 (0.201)	0.455 (0.298)
EPC					0.239 (0.300)	0.173 (0.380)
EPT			0.133 (0.552)	0.033 (0.884)	0.110 (0.647)	0.027 (0.886)
$\Delta$ EPRC			3.331 (0.208)	3.291 (0.149)		
$\Delta$ EPR					2.325 (0.220)	2.351 (0.153)
$\Delta$ EPC					-0.556 (0.792)	-0.388 (0.844)
$\Delta$ EPT			0.653 (0.804)	0.577 (0.826)	0.764 (0.775)	0.705 (0.792)
Greece 2012		-5.132 (0.010)		-5.173 (0.010)		-5.265 (0.011)
Luxembourg 2009		8.229 (0.002)		7.864 (0.004)		7.703 (0.005)
R <sup>2</sup>	0.322	0.468	0.345	0.483	0.348	0.483

p-values in parentheses.

result is robust to the specifications of the model. It is independent of the EPL indexes included in the model and the inclusion of dummies for outliers (Greece in 2012 and Luxembourg in 2009). To check the robustness of these conclusions, we have analysed the confidence intervals (90%, 95% and 99%) of the coefficients of the independent variables<sup>7</sup> (Greenland et al. 2016; Kennedy 2008). In all the cases, the results confirm the conclusions obtained based on the study of the p-values.

In sum, our results show that during the Great Recession the employment performance in the EU countries is not explained by higher or lower flexibility in the hiring or firing of temporary and permanent workers, and that economic growth is the only determinant of employment growth.

Table 6 reports the results of the estimations of the determinants of the growth of unemployment rate.<sup>8</sup> GDP growth has a significant impact on unemployment rate. A GDP growth rate of 1% reduces unemployment rates by 0.3 percentage points. However, the results of EPL indexes are ambiguous.

Regarding the effects of EPL indexes, the strictness in the use of temporary contracts has a negative impact on unemployment: higher EPT indexes generate higher increases of unemployment rates. This is a robust result. Comparing the Equations (3)–(6), we observe that the sign of the coefficient is the same, the values of the coefficients is similar, and, mainly, the significance is not by the inclusion of outliers. A one-standard deviation increase in the level of employment protection for temporary workers increases unemployment rate by 0.18–0.23 percentage points. This implies that the countries with the highest flexibility in the use of temporary contracts recorded the lowest increases in unemployment rates.

**Table 6.** Determinants of growth of unemployment rate.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.693 (0.039)	0.681 (0.010)	1.943 (0.142)	2.289 (0.036)	1.619 (0.232)	2.085 (0.098)
GDP	-0.330 (0.000)	-0.309 (0.000)	-0.322 (0.000)	-0.291 (0.000)	-0.304 (0.000)	-0.269 (0.000)
EPRC			-0.700 (0.167)	-0.797 (0.041)		
EPR					-0.510 (0.131)	-0.584 (0.048)
EPC					-0.081 (0.617)	-0.146 (0.336)
EPT			0.254 (0.042)	0.203 (0.053)	0.239 (0.044)	0.197 (0.105)
$\Delta$ EPRC			-0.529 (0.783)	-1.294 (0.502)		
$\Delta$ EPR					-0.523 (0.699)	-0.911 (0.507)
$\Delta$ EPC					1.426 (0.344)	1.231 (0.317)
$\Delta$ EPT			-0.691 (0.716)	-1.045 (0.494)	-0.803 (0.669)	-1.261 (0.380)
Estonia 2011		-2.789 (0.186)		-3.341 (0.084)		-3.510 (0.029)
Spain 2009		4.675 (0.008)		4.565 (0.003)		4.421 (0.006)
R <sup>2</sup>	0.482	0.570	0.500	0.597	0.513	0.605

p-values in parentheses.

The results differ in the case of EPRC index (Equations (3) and (4)). EPRC is only significant in the equation that includes the dummies for outliers (Estonia in 2011 and Spain in 2009) (Equation (4)). EPRC index, corresponding to the protection of permanent workers against individual and collective dismissals, has a significant inverse impact on the growth of unemployment rates: employment protection for permanent workers is associated with a decline in unemployment rates. Given the value of the coefficient of the index (0.80), a one-standard deviation (0.38) increase in the level of employment protection for permanent workers implies a decline in unemployment rate by 0.3 percentage points.

Equation (4) implies that the impact of employment protection on unemployment rates depends on the sample of countries-years analysed and the type of employment contract. Countries with high employment protection for permanent workers and high flexibility in the use of temporary contracts record smaller increases in unemployment rates. A possible explanation for these opposite effects could be that, during a recession or downturn, high protection for permanent workers against dismissal minimizes the impact of the decline in economic activity on permanent workers, whereas high flexibility in the use of fixed-term employment contracts favours the hiring of temporary workers.

We highlight that the reforms passed in this period regarding employment protection for regular and temporary workers did not have an impact on unemployment rates.

The above conclusions are reached when the model includes EPRC index. Since one of the objectives of the paper is to determine whether the impact of protection against individual and collective dismissals is similar, Equations (5) and (6) analyse the individual impacts of EPR and EPC indexes. Like in previous equations, changes in EPL indexes are not significant. This implies that the reforms passed in the employment

protection for permanent and temporary workers did not have an impact on the evolution of unemployment rates.

Equations (5) and (6) show that EPC index is not significant. Therefore, national differences in the evolution of unemployment rates are not explained by domestic differences in the specific requirements for collective dismissals of permanent workers. In contrast, EPR index has a statistically significant inverse impact on unemployment growth: p-value of the coefficient is 0.048 and the 95% confidence interval of this coefficient is  $(-1.162, -0.007)$ . The sign of the coefficient is negative, implying that countries with high protection for permanent workers against individual dismissals recorded smaller increases in unemployment rates: a one-standard deviation (0.55) increase in the level of EPR index reduces unemployment rate by 0.32 percentage points.

The impact of EPT index is not clear. When dummies for extreme values are not included, constraints on the use of temporary contracts increase unemployment rates, with larger EPT indexes leading to larger increases in unemployment rates. However, when outliers are included in the equation (Equation (6)), the p-value of the coefficient is above 10% (0.105). Nonetheless, the gap with the usual standard of 10% is very small; moreover, the 90% confidence interval of this coefficient is  $(-0.003, 0.398)$ . Therefore, we can argue that employment protection for temporary workers is associated with increases in unemployment rates.

Our results are contrary to the argument that high employment protection amplifies the response of unemployment to adverse demand shocks. For OECD (2012, 2017), an institutional setting that favours the use of temporary workers, through strict employment protection provisions for regular workers and loose regulation of the use of temporary workers, increases the response of unemployment to output shocks. Our findings reject this argument. Although EPR and EPT generate opposed effect on the growth of unemployment rates, given that the values of EPR coefficient are much higher than those of EPT, and that mean values of EPR and EPT indexes are similar, we can conclude that employment protection for permanent and temporary workers have contributed to slowdown the rise of unemployment rates in the EU countries.

## 7. Conclusions

Our paper proves the importance of economic growth as determinant of the labour market performance in EU countries during the Great Recession; hence, the need to implement measures to accelerate economic growth and accordingly accelerate the creation of employment and the decline in the unemployment rate.

Economic growth is the only significant determinant of employment growth. A higher or lower labour flexibility is not associated with a better or worse employment performance, and the reforms approved to reduce the employment protection for permanent and temporary workers did not have a significant impact on employment.

Regarding the growth of unemployment rate, the labour reforms changing the value of EPL indexes did not have a significant impact on changes in unemployment rate. However, we find opposed results about the impact of the level of EPL on unemployment: employment protection for temporary workers generates an increase in unemployment rates, but employment protection for permanent workers against individual dismissals is



associated to declines in unemployment rates. The aggregate effect of EPL on unemployment would be positive: employment protection for permanent workers in conjunction with that for temporary workers have contributed to reduce the growth of unemployment rates in EU countries,

The results of our analysis have clear policy implications. During recessions, the decline in employment and the rise of unemployment rates are explained by the decline in economic activity: Employment protection does not produce a negative impact on labour market. Indeed, although constraints to the use of temporary workers would rise unemployment rates, this impact would be more than offset by the positive impact generated by employment protection for permanent workers. This result implies that expansionary measures of macroeconomic policy must be implemented to improve the bad labour market results recorded during a recession, and that the approval of measures making the labour market more flexible can be counter-productive.

The conclusions reached in the paper are particularly relevant in the time when the final version of the paper (July 2020) is written. The similarities between the Global Financial Crisis and the COVID-19 crisis (both are unexpected supply-side shocks) allow that the lessons regarding the role played by labour institutions and labour market reforms, in particular those related to employment protection legislation, as determinants of the evolution of employment and unemployment during the Great Recession, can be extrapolated to the new economic scenario. Thus, the approval of measures reducing employment protection for workers would not contribute to create employment and to reduce unemployment rates. Consequently, any effective strategy to improve the labour market performance must be based on the implementation of expansionary demand-side policies.

Despite the relevance of the conclusions of our paper, and the consequent policy and analytical implications, we must take into account that our study covers a short period due to the limited availability of data for the EPL indexes. We will get a more precise knowledge of the impact of employment protection legislation when the OECD publishes updated data on EPL indexes. Moreover, Flaig and Rottmann (2013), using panel data models, argue that the magnitude of the effects of labour market institutions on labour results differ markedly among countries. This implies the need to perform empirical analyses on a national basis that allow reaching more accurate conclusions regarding the impact of employment protection legislation on national labour markets.

## Notes

1. Alternative EPL indicators are the EPLex index of the International Labour Organization ([https://www.ilo.org/travail/info/db/WCMS\\_435450/lang-en/index.htm](https://www.ilo.org/travail/info/db/WCMS_435450/lang-en/index.htm)) and the CBR Labour Regulation Index (CBR-LRI) of the Centre for Business Research at the University of Cambridge (<https://www.repository.cam.ac.uk/handle/1810/256566>). The main advantages of the OECD EPL indexes over EPLex index are that OECD EPL indexes cover a longer period, and that EPLex index only gives information on employment protection for regular contracts and individual dismissals. Regarding CBR-LRI (Adams et al. 2017; Deakin 2018), OECD EPL indexes have some advantages. First, the CBR-LRI dataset does not construct a synthetic composite index: this index must be estimated by the researcher, which creates problems of comparability among different studies. The second advantage has to

do with the theoretical foundations of the indicators. OECD indexes are based on the assumption that labour law rules introduce rigidities into the labour market. Consequently, they can be used to test empirically the hypothesis that flexible labour markets produce better results in employment and unemployment. In contrast, from a theoretical perspective, CBR-LRI indexes are formally neutral (Deakin 2018).

2. Many international organizations, such as OECD, IMF and European Commission, have based their recommendations in favor of a higher labour market flexibility on empirical studies that used OECD's EPL indexes (Myant and Brandhuber 2016).
3. Versions differ in terms of the number of indicators included in each index and the period covered (<https://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm>).
4. Due to space constraints, we cannot analyse the content of the labour law reforms in Europe that have affected the employment protection for workers. The interested reader can consult Clauwert and Schömann (2012) and Schömann (2014).
5. Hausman tests prove the validity of the random effects mode (data available upon request).
6. Data available upon request.
7. Data are available upon request.
8. The analysis of the confidence intervals (90%, 95% and 99%) of the coefficients of the independent variables confirm the conclusions obtained based on the study of the p-values. Data available upon request.

## Acknowledgements

This study was funded by the Spanish Ministry of Economics and Competitiveness (RTI2018-099225-B-I00). We thank the useful comments made by two anonymous referees. Usual disclaimer applies.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Funding

This work was supported by the Ministerio de Economía y Competitividad [RTI2018-099225-B-I00].

## ORCID

Jesus Ferreiro  <http://orcid.org/0000-0002-5732-7966>

Carmen Gomez  <http://orcid.org/0000-0002-9412-4367>

## References

- Adams, Z., P. Pastani, L. Bishop, and S. Deakin. 2017. "The CBR-LRI Dataset: Methods, Properties and Potential of Leximetric Coding of Labour Laws." *International Journal of Comparative Labour Law and Industrial Relations* 33 (1): 59–92.
- Anderton, R., et al. 2012. "Euro Area Labour Markets and the Crisis." *European Central Bank Occasional Paper Series No. 138*.

- Arestis, P., J. Ferreiro, and C. Gomez. 2020a. "Quality of Employment and Employment Protection. Effects of Employment Protection on Temporary and Permanent Employment." *Structural Change and Economic Dynamics* 53: 180–188. doi:10.1016/j.strueco.2020.02.008.
- Arestis, P., J. Ferreiro, and C. Gomez. 2020b. "Employment Protection Legislation and Income Labour Shares in Europe." *Panoeconomicus* 67 (3): 291–308. doi:10.2298/PAN2003291A.
- Avdagic, S. 2015. "Does Regulation Work? Reassessing the Unemployment Effects of Employment Protection." *British Journal of Industrial Relations* 53 (1): 6–26. doi:10.1111/bjir.12086.
- Avdagic, S., and P. Salardi. 2013. "Tenuous Link: Labour Market Institutions and Unemployment in Advanced and New Market Economies." *Socio-Economic Review* 11: 739–769. doi:10.1093/ser/mwt009.
- Ball, L. 2009. "Hysteresis in Unemployment." In *Understanding Inflation and the Implications for Monetary Policy*, edited by J. Fuhrer, Y. K. Kodrzycki, J. S. Little, and G. P. Olivei, 361–381. Cambridge Mass: MIT Press.
- Ball, L. 2014. "Long-term Damage from the Great Recession in OECD Countries." *European Journal of Economics and Economic Policies: Intervention* 11 (2): 149–160.
- Bertola, G. 2017a. "European Unemployment Revisited: Shocks, Institutions, Integration." *Research in Economics* 71: 588–612. doi:10.1016/j.rie.2017.06.002.
- Bertola, G. 2017b. "EMU and Labour Market Policy: Tensions and Solutions." *European Economy Discussion Paper No. 054*.
- Blanchard, O. 2017. "Should We Reject the Natural Rate Hypothesis?" *Peterson Institute for International Economics Working Paper No. 17–14*.
- Blanchard, O., and J. Wolfers. 2000. "The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence." *The Economic Journal* 110 (March): C1–C33. doi:10.1111/1468-0297.00518.
- Blanchard, O., and L. H. Summers. 1986. "Hysteresis and the European Unemployment Problem." *NBER Macroeconomics Annual* 15–90. doi:10.1086/654013.
- Blanchard, O., and L. H. Summers. 2017. "Rethinking Stabilization Policy. Back to the Future." Paper presented at the Rethinking macro policy conference at the Peterson Institute for International Economics, October. <https://piie.com/events/rethinking-macroeconomic-policy>
- Boeri, T., and J. F. Jimeno. 2016. "Learning from the Great Divergence in Unemployment in Europe during the Crisis." *Labour Economics* 41: 32–46. doi:10.1016/j.labeco.2016.05.022.
- Boeri, T., P. Cahuc, and A. Zylberberg. 2015. "The Costs of Flexibility-enhancing Structural Reforms." *A literature review. OECD Economics Department Working Papers No. 1264*.
- Brancaccio, E., N. Garbellini, and R. Giammetti. 2018. "Structural Labour Market Reforms, GDP Growth and the Functional Distribution of Income." *Structural Change and Economic Dynamics* 44: 34–45. doi:10.1016/j.strueco.2017.09.001.
- Ciminelli, G., R. Duval, and D. Furceri. 2018. "Employment Protection Deregulation and Labor Shares in Advanced Economies." *IMF Working Paper No. WP18/168*.
- Clasen, J., D. Clegg, and J. Kvist. 2012. "European Labour Market Policies in (The) Crisis." *European Trade Union Institute Working Paper No. 2012.12*.
- Clauwert, S., and I. Schömann. 2012. "The Crisis and National Labour Law Reforms: A Mapping Exercise." *European Trade Union Institute Working Paper No. 2012.4*.
- Damiani, M., F. Pompei, and A. Ricci. 2016. "Temporary Employment Protection and Productivity Growth in EU Economies." *International Labour Review* 155 (4): 587–622. doi:10.1111/j.1564-913X.2014.00023.x.
- De Almeida, L., and V. Balasundharam. 2018. "On the Impact of Structural Reforms on Output and Employment: Evidence from a Cross-country Firm-level Analysis." *IMF Working Paper No. WP18/73*.
- Deakin, S. 2018. "The Use of Quantitative Methods in Labour Law Research: An Assessment and Reformulation." *Social & Legal Studies* 27 (4): 456–474. doi:10.1177/0964663918760385.
- Dosi, G., M. C. Pereira, A. Roventini, and M. E. Virgillito. 2017. "When More Flexibility Yields More Fragility: The Microfoundations of Keynesian Aggregate Unemployment." *Journal of Economic Dynamics & Control* 81: 162–186. doi:10.1016/j.jedc.2017.02.005.

- Dosi, G., M. C. Pereira, A. Roventini, and M. E. Virgillito. 2018. "The Effects of Labour Market Reforms upon Unemployment and Income Inequalities: An Agent-based Model." *Socio-Economic Review* 16 (4): 687–720. doi:10.1093/ser/mwx054.
- Duval, R., D. Furceri, and J. Miethé. 2018. "The Needle in the Haystack: What Drives Labor and Product Market Reforms in Advanced Countries." IMF Working Paper No. WP/18/101
- Duval, R., and D. Furceri. 2018. "The Effects of Labor and Product Market Reforms: The Role of Macroeconomic Conditions and Policies." *IMF Economic Review* 66: 31–69. doi:10.1057/s41308-017-0045-1.
- Duval, R., D. Furceri, and J. Valles. 2017. "Job Protection Deregulation in Good and Bad Times." *IMF Working Paper No. WP/17/277*.
- European Commission. 2012. "Labour Market Developments in 2012." *European Economy* 5/2012.
- European Commission Directorate-General for Employment, Social Affairs and Equal Opportunities. 2010. *Employment in Europe 2010*. Luxembourg: Publications Office of the European Union.
- European Commission Directorate-General for Employment, Social Affairs and Inclusion. 2015. *Employment and Social Developments in Europe 2014*. Luxembourg: Publications Office of the European Union.
- Ferreiro, J., and C. Gomez. 2015. "The Economic Crisis in Spain: Mistakes Made in the Management of Labour Market and Fiscal Policy." In *Europe in Crisis. Problems, Challenges and Alternative Perspectives*, edited by A. Bitzenis, N. Karagiannis, and J. Marangos, 259–274. New York: Palgrave Macmillan.
- Ferreiro, J., and C. Gomez. 2017. "The Global Financial Crisis and the Labour Markets in Europe: Do Labour Institutions Matter?" In *Economic Policies since the Global Financial Crisis*, edited by P. Arestis and M. Sawyer, 265–311. Basingstoke: Palgrave Macmillan.
- Ferreiro, J., and C. Gomez. 2020. "Employment Protection and Labour Market Results in Europe." *Journal of Evolutionary Economics* 30 (2): 401–449. doi:10.1007/s00191-019-00656-5.
- Flaig, G., and H. Rottmann. 2013. "Labour Market Institutions and Unemployment: An International Panel Data Analysis." *Empirica* 40 (4): 635–654. doi:10.1007/s10663-012-9208-5.
- Flaschel, P., A. Greiner, C. Logeay, and C. Proano. 2012. "Employment Cycles, Low Income Work and the Dynamic Impact of Wage Regulations. A Macro Perspective." *Journal of Evolutionary Economics* 22: 235–250. doi:10.1007/s00191-011-0236-2.
- Friedman, M. 1968. "The Role of Monetary Policy." *American Economic Review* 58 (1): 1–17.
- Gal, P., and A. Theising. 2015. "The Macroeconomic Impact of Structural Policies on Labour Market Outcomes in OECD Countries: A Reassessment." *OECD Economics Department Working Papers No. 1271*.
- Greenland, S., S. J. Senn, K. J. Rothman, J. B. Carlin, C. Poole, S. N. Goodman, D. G. Altman, et al. 2016. "Statistical Tests, P Values, Confidence Intervals, and Power: A Guide to Misinterpretations." *European Journal of Epidemiology* 31 (4): 337–350. doi:10.1007/s10654-016-0149-3.
- Gutierrez-Barbarrusa, T. 2016. "The Growth of Precarious Employment in Europe: Concepts, Indicators and the Effects of the Global Economic Crisis." *International Labour Review* 155 (4): 477–508. doi:10.1111/ilr.12049.
- Hein, E. 2017. "Post-Keynesian Macroeconomics since the Mid 1990s: Main Developments." *European Journal of Economics and Economic Policies: Intervention* 14 (2): 131–172.
- Heyes, J., and P. Lewis. 2015. "Relied upon for the Heavy Lifting: Can Employment Protection Legislation Reforms Lead the EU Out of the Jobs Crisis?" *Industrial Relations Journal* 46 (2): 81–99. doi:10.1111/irj.12095.
- Howell, D. R. 2011. "Institutions, Aggregate Demand and Cross-country Employment Performance: Alternative Theoretical Perspectives and the Evidence." In *A Modern Guide to Keynesian Macroeconomics and Economic Policies*, edited by E. Hein and E. Stockhammer, 165–190. Cheltenham: Edward Elgar.
- Jump, R. C., and E. Stockhammer. 2019. "Reconsidering the Natural Rate Hypothesis." *FMM Working Paper No. 45*.
- Kennedy, P. 2008. *A Guide to Econometrics*. Malden: Wiley-Blackwell.

- Liotti, G., and R. R. Canale. 2020. "Poverty and Labour Market Institutions in Europe." *Panoeconomicus* 67 (3): 277–290. doi:10.2298/PAN2003277L.
- Myant, M., and L. Brandhuber. 2016. "Uses and Abuses of the OECD's Employment Protection Legislation Index in Research and EU Policy Making." *ETUI Working Paper No. 2016.11*.
- OECD. 2012. *OECD Employment Outlook 2012*. Paris: OECD Publishing.
- OECD. 2017. *OECD Employment Outlook 2017*. Paris: OECD Publishing.
- Rubery, J., and A. Piasna. 2016. "Labour Market Segmentation and the EU Reform Agenda: Developing Alternatives to the Mainstream." *ETUI Working Paper No. 2016.10*.
- Schömann, I. 2014. "Labour Law Reforms in Europe: Adjusting Employment Protection Legislation for the Worse?" *European Trade Union Institute Working Paper No. 2014.02*.
- Sharma, S., and H. Winkler. 2018. "The Labour Market Effects of Financial Crises. The Role of Temporary Contracts in Central and Western Europe." *Economics of Transition* 26 (1): 35–60. doi:10.1111/ecot.12141.
- Stockhammer, E. 2011. "The Macroeconomics of Unemployment." In *A Modern Guide to Keynesian Macroeconomics and Economic Policies*, edited by E. Hein and E. Stockhammer, 137–164. Cheltenham: Edward Elgar.
- Stockhammer, E., A. Guschanski, and K. Köhler. 2014. "Unemployment, Capital Accumulation and Labour Market Institutions in the Great Recession." *European Journal of Economics and Economic Policies: Intervention* 11 (2): 182–194.
- Tridico, P., and R. Pariboni. 2017. "Inequality, Financialization, and Economic Decline." *Journal of Post Keynesian Economics* 41 (2): 236–259. doi:10.1080/01603477.2017.1338966.
- Wooldridge, J. M. 2010. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, Mass: MIT Press.