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Abstract

The paper analyses the impact of employment protection legislation for permanent and temporary workers on total employment, permanent and temporary employment. Using panel data techniques, we investigate whether the level and the changes in employment protection for permanent and temporary workers affect the dynamics of total salaried employment, permanent employment, and temporary employment. The results of this paper contribute to a better understanding of the determinants of the evolution of employment and of the determinants of the quality of employment.

Keywords	Employment protection legislation; employment; permanent employment, temporary employment
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Following the Managing Editor’s comments, the paper has been carefully revised, correcting the grammar mistakes and typos existing in the earlier draft of the paper

Quality of Employment and Employment Protection. Effects of Employment Protection on Temporary and Permanent Employment

Highlights:

- Reforms reducing employment protection have not helped to increase employment
- High employment protection does not have a negative impact on employment
- Declines in employment protection for temporary workers segment the labour markets

Quality of Employment and Employment Protection. Effects of Employment Protection on Temporary and Permanent Employment

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Abstract:

The paper analyses the impact of employment protection legislation for permanent and temporary workers on total employment, permanent and temporary employment. Using panel data techniques, we investigate whether the level and the changes in employment protection for permanent and temporary workers affect the dynamics of total salaried employment, permanent employment, and temporary employment. The results of this

paper contribute to a better understanding of the determinants of the evolution of employment and of the determinants of the quality of employment.

Keywords: Employment protection legislation; employment; permanent employment, temporary employment

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

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1. Introduction

The high rate of temporary employment is one of the main distinctive features of European labour markets. According to Eurostat's European Union Labour Force Survey, in 2018 temporary employees represented 14.2% of total employees in the European Union and 16.2% in the Eurozone. The share of temporary employees exceeded 15% in Spain (26.9%), Poland (24.3%), Portugal (22%), Croatia (19.9%), Italy (17.1%), France (16.7%), Finland (16.2%), Slovenia (15.7%) and Sweden (15.6%). During the Global Financial Crisis and the Great Recession, between 2007 and 2013, due to more intense adjustment in temporary employment, the rate of temporary employees declined in the European Union from 14.6% to 13.6%, and in the Eurozone from 16.4% to 14.9%. However, since then, the rate of temporary employees has increased in both regions, with significant increases taking place in countries like Italy (+3.9 percentage points), Croatia (+5.4 percentage points) and Spain (+6.7 percentage points).

This high share of temporary employment not only would it be explained by a specific productive structure defined by a high weight of sectors and activities with a marked seasonal nature, like tourism or construction, but also by other factors, especially the existence of an institutional configuration of the labour market that favours the use of temporary and fixed-term employment contracts against the alternative of using standard (permanent, open-ended) employment contracts.

The high rate of temporary workers would be the result of measures approved to enhance the flexibility of the labour markets, which made easier the hiring of temporary workers. Thus, since the 1980s many countries approved measures to increase the flexibility of their labour markets with the purpose of reducing the high unemployment generated by the oil crises of the seventies (Blanchard and Wolfers, 2000). These countries approved labour reforms, which curbed firing costs and reduced restrictions on the use of non-standard employment contracts, thus promoting the use of temporary and part-time contracts. In many cases, the removal of restrictions on the use of temporary contracts accompanied the setting of lower compensation for the extinction of this kind of contract (in comparison with that for a permanent contract), giving rise to a segmented labour market with a rising share of atypical employment contracts. It was argued that an excessive employment protection for permanent employees had a negative impact on the figures of employment and unemployment. Consequently, the relaxation of the constraints to the use of temporary employment contracts, and the measures curbing firing costs and making easier the individual and/or collective dismissal of permanent workers, would help to accelerate the employment creation and to reduce the unemployment rates (European Commission, 2012; OECD, 2012, 2017).

However, as we show below, many studies question the alleged positive effects of the measures approved to reduce employment protection for temporary and permanent employees. These measures have generated a dual and segmented labour market with a rising share of temporary employees. Verification of the existence of an excessive number of temporary employees has led many countries, mainly since the onset of the Global Financial Crisis, to approve measures in order to reduce the rate of temporary employees, reducing employment protection for permanent workers and setting stricter employment provisions and constraints to the use of temporary employment contracts. These measures were based on the belief that an excessive rate of temporary employment has negative micro and macroeconomic consequences (lower economic growth, lower private consumption, higher economic instability, lower productivity, lower competitiveness, lower incentives to physical and human capital accumulation, and excessive household indebtedness) and also non-economic consequences, such as lower welfare, rising inequalities, poverty, and rise of populism. (Ferreiro and Gomez, 2017; Rubery and Piasna, 2016).

The objective of this contribution is to analyse the impact of employment protection for permanent and temporary employment on the labour market performance. More precisely, we study the impact of employment protection on total salaried employment, but we also analyse separately the impact on temporary and permanent employment.

Our study makes a significant contribution to the literature on the impact of employment protection legislation (EPL) due to the differences with respect to existing studies. First, contrary to most studies, which analyse the potential impact of EPL on unemployment rates and/or total employment, our contribution analyses whether employment protection affects the dynamics of employees, which are the type of workers that are directly affected by the legislation related to employment protection, namely, the conditions for hiring or firing a salaried worker. It should be noted that our dependent variables are not the figures of employees but the rate of growth of employees. Therefore, we are testing the hypothesis that the dynamics of salaried employment is explained by the interaction between economic shocks and the employment protection for permanent and temporary workers.

Second, unlike other studies that analyse the impact of employment protection legislation on labour market performance, focusing only on the impact of employment protection for permanent workers, we analyse the impact on salaried employment of the employment protection for permanent and temporary workers. Therefore, we use two different indexes of employment protection as explanatory variables: one concerning the employment protection for permanent workers and the other concerning the protection for temporary workers.

Third, besides the impact of EPL on total salaried employment, we analyse separately the impact of EPL on the evolution of permanent and temporary employees. In both cases, we use as explanatory variables the indexes corresponding to the employment protection for both categories of employees.

Fourth, although some theoretical studies argue that the relationship between employment protection and employment is not a linear one, implying that an excessive protection can have a negative impact on employment, however, most empirical studies test the

existence of a linear relationship. On this score, our study tests the potential existence of a non-linear relation between employment protection and employment results.

Fifth, our study also tests the hypothesis that the evolution of employees (total, permanent and temporary employees) not only is it affected by the individual levels (and changes) of employment protection for permanent and temporary workers, but also by the existence of significant differences between the protection for temporary and permanent workers.

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

2. Labour market institutions, employment protection and labour market performance

According to the New Consensus Macroeconomics (NCM), labour market institutions are the main determinants of the labour markets performance. Institutions that enhance the flexibility in the labour market, allowing a fast adjustment in prices (wages) and quantities (employment) when an economic shocks take place, lead to higher levels of employment and lower unemployment rates. In this approach, the negative results of employment and unemployment are 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 long-term unemployment (Blanchard and Wolfers, 2000). Consequently, 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, such as the European Commission, the International Monetary Fund, and

the Organization for Economic Cooperation and Development (OECD), many economies have approved labour market reforms. These reforms have acted on what is presumed to be the main sources of rigidities in labour markets: unemployment protection schemes, collective bargaining, and employment protection legislation (Brancaccio et al., 2018; Ferreiro and Gomez, 2017; Kugler, 2019; McBride and Watson, 2019; Tridico and Pariboni, 2017). It was taken for granted that in the long-run these reforms would lead to more employment and to lower and more stable unemployment rates.

Despite the spreading and intensity of these reforms, the empirical evidence on the impact on employment and unemployment of labour institutions is not conclusive (Avdagic and Salardi, 2013; Bertola, 2017; Kugler, 2019). 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). Such recommendation is shared by some mainstream economists, like Ball (2009, 2014) and Blanchard and Summers (2017), who argue that high unemployment rates in many European countries are explained by hysteresis effects generated by restrictive demand-side policies; hence, the need for a change in the relevant strategies of macroeconomic policies.

Furthermore, many studies argue that labour market institutions have positive effects on labour markets and economic activity: 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 innovations. Relevant studies on this score are: Brancaccio, et al. (2018), Ciminelli et al. (2018), Dosi et al. (2017, 2018), European Commission Directorate-General for Employment, Social Affairs and Inclusion (2015), Flaschel et al. (2012), Kugler (2019), and Lavoie (2017).

Mainstream studies on the role played by labour institutions on labour market results have focused on the impact of employment protection legislation (EPL). Employment protection legislation is the set of rules that in each country govern the hiring and firing of employees. 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). 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 NCM, employment protection legislation generates rigidities in the functioning of the labour market, leading to unemployment and labour segmentation when firing costs or restrictions differ among groups of workers (Arestis, 2009; Blanchard and Wolfers, 2000; Fadda, 2013). To reduce high unemployment rates, many countries have introduced since the eighties 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. Labour segmentation would result from differences in employment protection for permanent and temporary workers (OECD, 2017). The increased use of temporary employment contracts would be explained by the lower protection of these workers (in terms of lower compensations in case of dismissal or expiration of fixed-term employment contracts) and the possibility of using workers with temporary contracts for jobs with a structural-permanent nature. Furthermore, lower wages of temporary workers would add another incentive to use this kind of employment contracts.

Despite the generalization of these reforms, there is no unambiguous empirical evidence on their impact on employment and unemployment rates (Bertola, 2017; Boeri, et al., 2015; Heyes and Lewis, 2015; OECD, 2018). For Blanchard and Wolfers (2000), implementation of measures that increased 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 (European Commission, 2012; OECD, 2006, 2012, 2017, 2018).

However, many studies conclude that a high employment protection has no negative impact on unemployment (Adams et al., 2019; Avdagic, 2015; Avdagic and Salardi,

2013; Bertola, 2017; Boeri et al., 2015; Flaschel et al., 2012; Heyes and Lewis, 2015; Myant and Brandhuber, 2013). Consequently, labour market reforms implemented since the 1980s would have not contributed to reducing high unemployment rates. 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 et al., 2013; OECD, 2018; Rubery and Piasna, 2016; Tridico, 2017).

To a great extent, these negative consequences would be the result of an excessive use of temporary employment contracts and the consequent excessive rate of temporary employees. In this sense, since the onset of the Global Financial Crisis in August 2007, some European countries have approved measures increasing the employment protection of temporary workers to reduce the excessive labour segmentation. However, this stronger protection for temporary workers in many cases has come in tandem with a smaller protection for permanent workers (Ferreiro and Gomez 2017).

The doubts about the effects of EPL have increased with recent studies that focus on the period after the onset of the Global Financial Crisis. Anderton et al. (2012), Boeri and Jimeno (2016), and Sharma and Winkler (2018) argue that a high employment protection for permanent workers is associated with higher increases of unemployment in Europe. By contrast, Stockhammer et al. (2014) conclude that EPL does not have a significant impact on unemployment rates in OECD countries. For Blanchard (2017), replicating Blanchard and Wolfers' (2000) study and extending the period analysed to 2015, EPL is not a significant determinant of unemployment rates. Lastly, Ferreiro and Gomez (2017) and Tridico (2013, 2017) show that, during the Great Recession, the European Union countries with high employment protection show the best labour market results.

It should be emphasised that some studies conclude that the impact of the reforms that reduced the employment protection of workers had an uncertain effect on total employment. The reason is that the impact of employment protection can differ among groups of workers, depending on factors such as gender, age, skills, or type of employment contract (Boeri et al., 2015; Gal and Theising, 2015). Furthermore, some

more 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-run. In this sense, the recent view adopted by the OECD should be highlighted. OECD (2018) suggests that employment protection for permanent workers "tends to have either no or a small negative effect on employment" (p. 124). Only an *excessive* employment protection for these workers can have negative consequences on job quality, inclusiveness and productivity, but only in case it comes with a lower protection for temporary workers.

This view implies that the negative impact of employment protection on employment would be the result of an excessive protection for workers and a significant difference between the employment protection for permanent and temporary employees (OECD, 2012). This reasoning is implicitly assuming that the level effects (and changes) of employment protection can be opposite for permanent and temporary employment, leaving unchanged total employment (permanent plus temporary employment). The only impact would be in terms of the composition of employment, leading to a segmentation between temporary and permanent employees, with a rising share of the former.

It is also argued that the evolution of temporary and permanent employees may differ along the business cycle. In other words, the elasticity of employees/GDP may be different for permanent and temporary workers, making labour markets less resilient to economic shocks, amplifying the response of employment to demand shocks. Thus, for Duval et al. (2019) reforms that make more flexible the hiring of temporary workers increase employment during strong economic conditions, but reduce employment during downturns.

3. Empirical Framework

The objective of this contribution is to analyse whether the dynamics of total salaried employment, temporary employees and permanent employees, is determined by the interaction between employment protection legislation and economic growth (GDP growth rate).

To estimate the effects of employment protection legislation, we use the Employment Protection Legislation (EPL) strictness indexes elaborated by OECD. OECD EPL indexes measure the strictness of employment protection for permanent and temporary contracts, constructing synthetic indicators based on the values attached to 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.[1]

These indexes have several advantages. Given the common methodology to estimate the indexes, they allow comparison of the employment protection legislation among countries. Moreover, changes in the labour law imply a change in the value of the indexes. A labour law reform making labour markets 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 different of 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, thereby allowing comparisons of different studies' results.

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 employment contracts. 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. OECD elaborates different versions of these indexes, that differ among them in terms of data items included in the index and the period covered.

In this contribution we seek to analyse separately the impact on the dynamics of salaried employment of the protection for permanent workers against individual and collective dismissals and of regulations for the use of temporary contracts. Consequently, our

[1] Available at: http://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm

models will use two indexes: the EPR (EPR_V1) and the EPT (EPT_V1) indexes. The choice of these versions of both indexes is due to the longer spam of the analysed period.

It is important to emphasize that, as stated above, employment protection can affect the dynamics of employment in different ways. A first impact would be that of generated on total employees by the level of employment protection for workers. As mentioned, one advantage of the OECD EPL indexes is that we can include in our empirical model the level of the EPL index for the permanent workers (EPR) and for temporary and agency employees (EPT). Therefore, we can test the impact on employment of the employment protection for permanent and temporary workers.

Furthermore, some studies claim that the relationship between levels of employment protection and results in relation to employment and unemployment is not linear, with negative effects of employment protection on employment occurring when there is an excessive protection, mainly for permanent workers. Consequently, our estimation tests the existence of a non-linear quadratic relation between the rate of growth of employees and the levels of employment protection. In this way, we can test the existence of increasing or decreasing marginal effects of employment protection; this would imply the existence of a threshold from which the size, and perhaps the sign, of these effects change.

It must also be noted that some studies argue that the impact of employment protection on employment is larger when there is a big difference between the employment protection for permanent and temporary employees. EPR and EPT indexes are not homogenous, and, consequently, they are not comparable. This implies that if, for instance, the value of the index EPR is higher than that of the index EPT, it cannot be concluded that employment protection for permanent workers is higher than that for temporary workers. In any case, in our estimation we have included as explanatory variable the ratio EPR/EPT, as a proxy for the difference in employment protection for both groups of workers. Regardless of the true difference in the protection for both groups of employees, a higher value of this ratio can be interpreted as a bigger gap in employment protection in favour of the permanent workers. Indeed, in a country i, an increase in the ratio between the years t and $t+1$ would imply that employment protection for permanent workers has increased or that the employment protection for temporary workers has

declined. In both cases, relative protection for permanent workers has improved in relative terms; that is, compared to that for temporary workers.

Besides the levels in country *i* of EPR and EPT indexes at the beginning of year *t* ($EPR_{i,t}$ $and\ EPT_{i,t}$), we also test the impact of the labour reforms, which change the rules affecting employment protection for permanent and temporary workers. The variables $\Delta EPR_{i,t}$ and $\Delta EPT_{i,t}$ show, respectively, for each year *t* the change in country *i* of the EPR and EPT indexes.

Changes in the current year of the EPL indexes can provide a limited information about the true impact of changes in 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 introduced and the time when it effectively changes the decisions of hiring-firing workers. Moreover, changes in the indexes do not indicate the date of the year that such reforms are approved and come 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: $\Delta EPR_{i,t-1}$ and $\Delta EPT_{i,t-1}$.

It must be noted that we use employment protection for permanent and temporary employees as explanatory variables of the rate of growth of total employees and of permanent and temporary employees. This implies that we assume that the evolution of both groups of employees is affected by employment protection for permanent and temporary employees

In sum, we estimate the following three equations:

Eq. 1: $\Delta Total\ Employees_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 EPR_{i,t} + \beta_3 EPR_{i,t}^2 + \beta_4 EPT_{i,t} + \beta_5 EPT_{i,t}^2 + \beta_6 EPR/EPT_{i,t} + \beta_7 \Delta EPR_{i,t} + \beta_8 \Delta EPR_{i,t-1} + \beta_9 \Delta EPT_{i,t} + \beta_{10} \Delta EPT_{i,t-1} + \epsilon_{i,t}$

Eq. 2: $\Delta Permanent\ Employees_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 EPR_{i,t} + \beta_3 EPR_{i,t}^2 + \beta_4 EPT_{i,t} + \beta_5 EPT_{i,t}^2 + \beta_6 (EPR/EPT)_{i,t} + \beta_7 \Delta EPR_{i,t} + \beta_8 \Delta EPR_{i,t-1} + \beta_9 \Delta EPT_{i,t} + \beta_{10} \Delta EPT_{i,t-1} + \epsilon_{i,t}$

Eq. 3: $\Delta Temporary\ Employees_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 EPR_{i,t} + \beta_3 EPR_{i,t}^2 + \beta_4 EPT_{i,t} + \beta_5 EPT_{i,t}^2 + \beta_6 EPR/EPT_{i,t} + \beta_7 \Delta EPR_{i,t} + \beta_8 \Delta EPR_{i,t-1} + \beta_9 \Delta EPT_{i,t} + \beta_{10} \Delta EPT_{i,t-1} + \epsilon_{i,t}$

EPC index data are available since 1985. However, given that we seek to estimate the impact of the current and lagged changes in the EPR and EPT indexes on total employees, temporary and permanent employees, the choice of the period analysed is affected by the availability of data of employees (total, permanent and temporary employees) from the Eurostat database analysed. The period analysed in the study covers 25 years, from 1988 to 2012. Therefore, we have a balanced panel with 275 observations (11 countries[2] and 25 years).

4. Empirical Estimations

Table 1 shows the main descriptive statistics of the explained and explanatory variables used in the study. Regarding the evolution of employees, it must be noted that the rate of growth of temporary employees is almost three times that of the permanent employees. This higher growth of temporary employment explains the increase recorded in the rate of temporary workers, which for the eleven countries analysed increased from 6.3% in 1987 to 13.8% in 2012, and 14.7% in 2018.

Table 1. Descriptive statistics

	Mean	Median	Maximum	Minimum	Standard Deviation
ΔEmployees	1.255	1.101	2.951	-9.530	3.153
ΔPermanent Employees	1.103	0.924	3.014	-9.326	3.210

[2] Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, and the United Kingdom.

ΔTemporary Employees	2.957	2.260	7.136	-3.781	1.159
ΔGDP	2.201	2.337	1.728	-9.133	2.838
EPR	2.479	2.385	5.000	1.095	0.872
ΔEPR_t	-0.015	0.000	0.190	-1.190	0.100
ΔEPR_{t-1}	-0.012	0.000	0.190	-1.190	0.096
EPT	2.352	2.375	4.875	0.250	1.454
ΔEPT_t	-0.050	0.000	0.563	-2.250	0.250
ΔEPT_{t-1}	-0.050	0.000	0.563	-2.250	0.250

Source: Own calculations, based on Eurostat and OECD.

Regarding the EPL indexes, the mean value of the EPR and EPT indexes has declined, showing a generalized - though with exceptions, as shown below - process making the conditions to hire and fire workers more flexible. We want to emphasize the larger decrease recorded in the EPT index. For the eleven countries analysed, the mean value of the EPR index fell from 2.61 in 1987 to 2.30 in 2012. However, in this period the EPT index fell from 3.00 to 1.74, showing that the larger flexibility in the use of temporary employment contracts was the main measure approved to enhance the flexibility of the labour markets.

The median value of the changes in the EPL indexes is zero because of the small number of observations with changes in the indexes. Out of the 275 yearly observations included in our analysis, the EPR index changed in 34 observations, and the EPT index changed in 29 observations.

In addition to the above mentioned explanatory variables, our estimations include a dummy (Germany 1991) to account for the impact of German reunification on the size of German GDP and the number of employees (total, permanent and temporary). The estimations we have carried out show, first, that the dummy is significant when we estimate the determinants of the rate of growth of total employees and permanent employees; and, second, that the explanatory capacity of the model, as measured by the coefficients of determination, is much higher. Consequently, the dummy has been included in both estimations. Nonetheless, it also creates some problems: first, we cannot apply a panel data model with fixed or random effects; second, the significance of some

variables changes.[3] This implies, that we must accept that this study's results can be influenced by our choice of countries and years, and that with another different set of observations (different countries and/or years) the results obtained can be different.

In the case of the rate of growth of temporary employees, the dummy for Germany in the year 1991 is not significant at all. The redundant variable test shows that the exclusion of the dummy does not affect the model, and, consequently it has not been included in the estimations of the growth of temporary employees, thus allowing the use of fixed and random effects panel models.

The Lagrange multiplier (LM) test reports the existence of cross-section effects.[4] Consequently, our estimations include cross-section effects. European economies are highly interrelated; therefore, they are affected by common shocks, such as the Global Financial Crisis and the subsequent Great Recession. The cross-section dependence panel tests show the existence of cross-section dependence.[5] Therefore, we apply SUR estimators to correct the contemporaneous correlation between cross-sections.

The first column of Table 2 shows the results of the estimation of the determinants of the rate of growth of total employees. Reported data show that only economic growth is a significant explanatory variable of the growth of employees. The data also show that the employment protection variables are not significant. The only exception is squared-EPR. The positive sign of the corresponding coefficient would imply that there would be a positive impact of employment protection on employees' creation, implying that the positive impact increases exponentially with the higher level of protection for permanent workers. Nonetheless, this result must be taken with caution: if we exclude the dummy Germany-1991, the variable maintains its statistical significance but there is a change in the sign: the effect would be negative, with higher levels of employment protection for permanent workers having a negative impact on salaried employment creation. Therefore, this result is not a robust one.

Table 2. Determinants of the growth rate of employees

[3] Data available upon request.
[4] Data available upon request.
[5] Data available upon request.

	Employees	Permanent Employees	Temporary Employees	
Constant	-2.956* (1.511)	-3.630** (1.765)	17.177 (12.347)	2.693 (26.478)
GDP	0.716*** (0.062)	0.612*** (0.071)	1.368*** (0.269)	0.744* (0.411)
EPR	0.874 (0.653)	0.479 (0.831)	-1.126 (3.887)	12.108 (16.280)
EPR^2	0.167* (0.100)	-0.157 (0.134)	0.466 (0.717)	-0.140 (2.747)
EPT	1.009 (0.737)	1.847** (0.811)	-8.259 (5.457)	-14.204** (6.515)
EPT^2	-0.147 (0.106)	-0.255** (0.118)	1.074 (0.778)	1.742* (0.895)
EPR/EPT	0.190 (0.284)	0.498 (0.306)	-3.854* (2.215)	-6.059** (2.670)
ΔEPR	0.798 (1.383)	0.671 (1.668)	2.283 (7.119)	6.276 (7.842)
ΔEPRt-1	0.093 (1.423)	-0.074 (1.718)	1.789 (0.807)	-0.112 (7.844)
ΔEPT	0.569 (0.442)	0.864* (0.480)	-2.630 (2.518)	-3.347 (2.836)
ΔEPTt-1	-0.176 (0.435)	0.557 (0.468)	-7.924*** (2.506)	-9.185*** (2.703)
Germany 1991	17.076* (2.158)	19.288*** (2.220)		
R^2	0.666	0.592	0.143	0.275
Cross-section random effects	No	No	Yes	
Cross-section fixed effects	No	No		Yes
Period fixed effects	No	No		Yes

Source: Own Calculations
Notes:
Standard error in parentheses
*p-value<0.1
** p-value <0.05
*** pvalue<0.01

In summary, the creation of salaried employment is not affected by employment protection legislation. We do not find a significant relationship between the rate of growth of total employees and the levels of employment protection for permanent and temporary employees, current and lagged changes in the indexes (the reforms approved that increase or reduce the employment protection of workers, and the differences in the employment protection for both groups of employees). We must emphasize that this result is robust to changes in the explanatory variables included in the estimation. Although the results are not presented due to space constraints, the conclusion is the same when current and lagged changes in EPR and EPT indexes are not included; or when we test separately the levels of the EPR and EPT index, with the possible existence of a quadratic relationship between

the growth of employees and the EPT and EPR indexes, or the relative differences between both groups of employees.

Column 2 shows the estimation results of the determinants of the rate of growth of permanent employees. As expected, economic growth leads to a higher growth of permanent employees. A striking result is that the employment protection for permanent workers does not affect the evolution of these workers. We have not found a (linear or non-linear) relationship between the level of protection for permanent employees and the rate of growth of these workers. Furthermore, the current and lagged changes in the protection for these workers do not either affect the growth of permanent employees. On the contrary, we find a non-linear relationship between the growth of permanent employees and the employment protection for temporary employees, with a decreasing marginal effect, in a way that the impact decreases when the level of the EPT index is above 3.45. Nonetheless, given that the score of the EPT index ranges from 0 to 6, the impact of the EPT index on the creation of permanent employment is always positive.

We must highlight the relevance of this threshold. The mean and median of the EPT index are 2.35 y 2.37, respectively. This implies that in a high number of cases there was an 'excessive' protection (strong provisions to the use of temporary contracts) for temporary employees, that is, values of the EPT index above the estimated threshold. Thus, the EPT index was above 3.45 in Belgium in the period 1988-1998, in Spain in 1988-1994, in France since 1991, in Italy in 1988-1999, and in Greece in 1988-2003. Strong constraints to the use of temporary contracts in these countries would have curbed the growth of permanent employees. This non-linear relation is also detected when we the current and lagged changes of the EPT and EPR indexes are not included; this is a proof of the robustness of our conclusion.

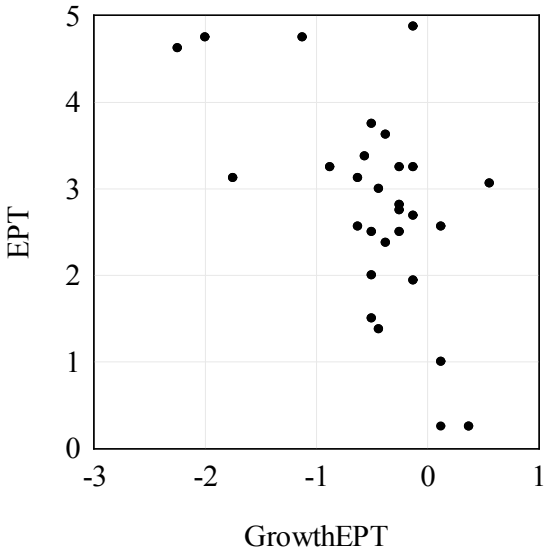
The estimation results show that the existence of severe constraints to the use of temporary contracts accelerates the creation of permanent employees, although above a threshold the impact is smaller. That is, an excessive protection for temporary workers leads to a smaller increase of permanent employment. An explanation for this result is that when the protection for temporary employees is very similar to that for permanent employees, the potential benefits of a more intensive use of fixed-term employment contracts decline, which implies a larger incentive to hire permanent workers. However,

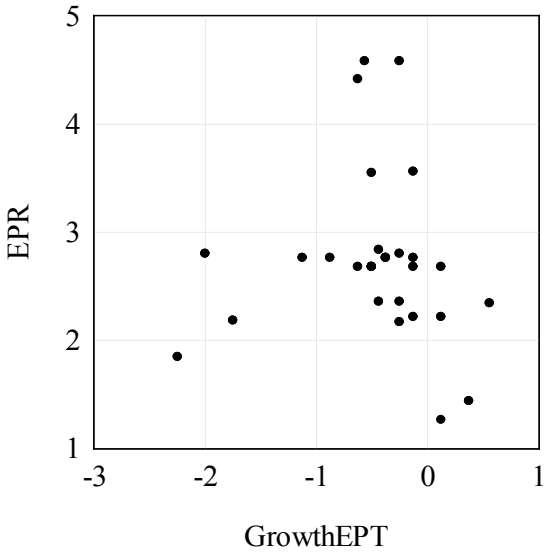
marginal effects are decreasing. It is likely that a stronger protection for temporary employees has a negative impact on the number of these workers. In an economy with a high weight of sectors whose activity has a clear seasonal nature, implying a more intense use of temporary workers, for instance, agriculture, construction, tourism, etc., the hiring of fixed-term workers disincentive can have a negative impact on the activity of these sectors and, consequently, on the level of employment in these industries, including permanent employees. Similar results emerge if there is an optimal or structural rate of temporary workers; this makes these firms to need to have a certain number or share of temporary employees (to develop some activities, like R&D, and employ new and trainee employees; or to face seasonal demand fluctuations, for instance). A disincentive to temporary hiring may affect the activity of these companies, and, consequently, their permanent workforce.

The above conclusions are reinforced by the impact of current changes in the EPT index on the growth of permanent employees. The ΔEPT coefficient sign is negative, implying a direct relation between the changes in the EPT index, the reforms approved changing the provisions to the use of temporary employment contracts, and the rate of growth of permanent employees. As data from Table 1 shows, the mean value of this variable is -0.05. Consequently, the reforms reducing the constraints to the use of fixed-term employment contracts reduced the growth of permanent employment. Indeed, the declines in the EPT indexes range from 0.125 to 2.25 points. Given the high value of the EPT coefficient (0.86), the reforms in the protection for temporary workers had a strong negative impact on the growth of permanent employees.

This conclusion seems to be in contradiction with the previous conclusion that a higher level of protection for temporary workers has a positive effect on the growth of permanent employees. A reasonable explanation would be that the largest declines in the EPT indexes have happened in the countries with high levels of employment protection for these employees.

Figure 1. Relationship between the growth of EPT index and the EPT and EPR indexes





Source: Own construction

Figure 1 shows the relation between changes recorded in the EPT index and the level of the EPR and EPT index at the beginning of those years. The highest declines in the EPT index occurred in cases where the value of the EPR index was close or below the mean, and also where protection for temporary workers was higher, well above the mean of the EPT index and above or close to the threshold (3.45) that generates a negative marginal impact; in other words where protection for temporary workers can be considered excessive. Thus, for instance, the largest declines in the EPT index took place in Belgium in 1998 and Greece in 2003. In the Belgian case, the values of the EPR and EPT indexes were, respectively, 1.84 and 4.62, and in the Greek case 2.80 and 4.75. This high protection for temporary employment implies that a strong decline in the constraints to

using temporary employment contracts can lead to a strong rise in the hiring of these employees and to a substitution of permanent employees by temporary workers. Thus, in 1998 in Belgium the temporary employment increased by 24.6% in parallel to a decline of permanent employees by 1.3%. In Greece, in 2003 temporary employees declined by 1.2%, with permanent employment growing by 2.9%; however, in 2004, with GDP growing at a rate of 5%, permanent employment grow 3.5% but temporary employment rose by 16.4%

Columns 3 and 4 show the estimations of the determinants of the rate of growth of temporary employees. In column 3 we have estimated a panel data model with cross-section random effects, and in column 4 we have used a panel data model with cross-section fixed effects. Although with differences, both estimations lead to similar and coherent conclusions.

It must be highlighted that the R^2 coefficient is quite low in both estimations. This outcome implies that the high rate of growth of temporary employment is mostly explained by other variables not included in our model, different from the economic growth and employment protection for employees. This conclusion leads to the need to analyse in future research other elements that can affect employment, like the increase in working age population, the higher weight of industries and activities characterized by a stronger use of temporary contracts (tourism, construction, retail trade, etc.), the process of technological change based on a more intense use of temporary workers, a bigger uncertainty about the economic activity in the short and medium term that disincentives the permanent hiring, the growth of segments of population with a higher rate of temporary employment (young people, women), or a change in business and management cultures that promote the use of temporary employment contracts.

In both estimations, the GDP growth is a significant determinant of the rate of growth of temporary employees, with a value of its coefficient that is much higher than that for permanent employees. This means that the economic growth creates more temporary jobs than permanent ones, thus raising the rate of temporary workers.

As in the case of permanent employment, protection employment for permanent employees does not explain the changes in temporary employment. This is a robust result

that is not affected by changes in the specification of the model, like the existence of a linear relation between EPL indexes and the growth of temporary employment, or when the only impact tested is that of the levels of EPR and EPT indexes (data available upon request).

The lagged change in the EPT index is a significant variable in both models (random and fixed-effect). The coefficients' sign is negative. This implies that the EPT index recorded decline has accelerated the growth of temporary employees. Although the mean value of this variables is low (see Table 1), the high value of the coefficients (-7.9 and -9.2) implies a substantial impact on the rate of growth of temporary employment (above 0.4 percentage points). Indeed, the true impact would be much greater. The observed declines in the EPT index oscillate between 0.125 and 2.25, which implies that the reforms facilitating the use of temporary employment contracts have had, at least in the short-term, a substantial impact on the growth of temporary employees.

In the random effects estimation, employment protection for temporary employees does not significantly affect the rate of growth of temporary employees. This is not the case when the model is estimated using a fixed effects model. In this model, we detect a non-linear impact of the EPT index, with a decreasing marginal impact of the EPT index (the threshold is 4.05). Since the EPT index ranges between 0 and 6, employment protection for temporary employees has a negative impact on the growth of temporary employees, although when the EPT exceeds the aforementioned threshold, the negative impact is less and less. The existence of a decreasing marginal negative impact implies that, given that during the analysed years there has been a decline in the mean value of the EPT index, as a result of the reforms that have reduced the constraints in terms of the use of temporary employment contracts, the rate of growth of temporary employment has accelerated, contributing to rise of the rate of temporary workers.

Contrary to what happened in the case of permanent employees, the ratio EPR/EPT, which proxies the difference between the protection for permanent and temporary workers, is a significant determinant of the growth of temporary employees. The coefficient has a negative sign, which implies an inverse (negative) relation between the differences in employment protection for both groups of workers and the growth of temporary workers. The larger the difference between employment protections for both

groups of workers, the lower the growth of temporary workers. This result implies that the differences in employment protection for different workers have an impact on the growth of temporary workers. The higher the relative protection for permanent workers the lower growth of temporary employees, a result that can be in view of the difficulties faced by companies to substitute permanent workers for temporary ones.

Between 1987 and 2012, the ratio EPR/EPT has recorded a small increase from 1.69 to 1.76. It should be noted that the rise in the ratio is the consequence of a decline in the EPT index, which was higher than what occurs in the EPR index. In any case, the result obtained is contrary to what is argued by mainstream analyses, which claim that the existence of these differences contributes to increases in temporary employment.

In sum, our findings show that, contrary to what is argued in mainstream analysis, employment protection is not a significant determinant of the growth of total employees. It cannot be claimed that rigid labour markets, that is, labour markets characterized by high employment protection for permanent and temporary workers, generate bad results in terms of employment protection. Consequently, the approved approved that have contributed to rising flexibility of labour markets by reducing employment protection for permanent and/or temporary workers are not empirically justified.

In this sense, our results prove that the reforms which have reduced the constraints for the use of temporary and agency workers, have contributed to generating a higher labour segmentation, accelerating the growth of temporary employees and, consequently, the rate of temporary employees.

5. Summary and Conclusions

Our analytical results show that employment protection legislation does not explain the dynamics of salaried employment in the set of 11 European Union countries analyzed. Our estimations show, first, that only GDP growth is a significant determinant of the rate of growth of employees, and, second, that employment protection for permanent and temporary workers does not explain the dynamics of total employees. In this sense, our paper reinforces those studies that claim that the generalized reforms implemented in

Europe in the last decades making labour markets more flexible have not led to a higher growth of employment.

This does not mean that the reforms in employment protection have not had an impact on labour markets. Indeed, the performance of European labour markets is characterized by a rising rate of temporary workers. This implies that those labour market reforms have had different consequences on permanent and temporary employees.

Our results show that employment protection for permanent employees has not affected the evolution of permanent or temporary employment, with employment protection for temporary employees being the only variable related to employment protection affecting the dynamics of permanent and temporary employment. Our estimations results clearly imply that constraints to the use of temporary workers have a positive impact on the growth of permanent employment, and that the reforms that led to a lower protection for temporary employment had a negative impact on permanent workers. Regarding the impact on temporary employment, the reforms that reduced the constraints to the use of temporary workers and agency workers accelerated the growth of temporary workers. In coherence with this result, high values of the EPT index, that is, tighter provisions to the use of temporary workers, contribute to slow down the growth of these workers. This implies that the declining value of the EPT in the European Union explains the more intense growth of temporary employees and the consequent rise of the rate of temporary workers.

In summary, our study proves that the reforms introduced in the last decades in employment protection have not contributed to generate more employment. They have instead contributed to a higher labour market segmentation and to a rising weight of temporary workers.

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