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# Labour Market Flexibilization and Income Distribution in Europe

**Summary:** This paper analyses the role played by the flexibilization of labour markets on functional income distribution. Specifically, we analyse whether employment protection legislation affects the evolution of labour income share, measured by the size of compensation of employees as a percentage of GDP, the sum of wages and salaries as a percentage of GDP and the size of the adjusted wage share, in twenty European economies. Our study's results show that the evolution of labour income share is explained by the economic growth, the growth of employment and unemployment rates, and the growth of real wages. Regarding the role played by the flexibility of the labour market, and specifically of the employment protection legislation, only employment protection for temporary workers has a significant impact on the evolution of labour shares. Our results show that stricter provisions on the use of fixed-term and temporary agency contracts have a positive impact on the growth of labour shares.

**Key words:** Employment protection legislation, Labour markets, Labour income share, Income distribution.

**JEL:** C33, E24, E25, F66.

The inequality of income distribution is a topic that has gained relevance in the economic analysis and in the political agenda. Although in the past the study of income distribution was focused on the sphere of the personal distribution, in the last two decades the study of the functional income distribution has flourished, with a high number of contributions focusing on the evolution of labour shares in developed economies.

Our paper seeks to contribute to the analysis of the study of the determinants of the evolution of the participation of labour incomes on GDP. In this sense, we focus our attention on the impact of the employment protection legislation (EPL) on labour income share. In this sense, a difference with existing papers is that we will check the robustness of our conclusions testing whether our conclusions differ depending on the explanatory variables included in the estimated models, the kind of relationship (linear or non-linear) between the explained and the explanatory variables, and the variable used to measure the evolution of labour income.

The paper is structured as follows. After this short introduction, Section 1 analyses the impact on income distribution of labour institutions, and focuses on employment protection legislation. Section 2 provides our theoretical framework, and Section

3 presents our empirical framework. Section 4 containing our empirical investigation, Section 5 presents the empirical results and relevant discussion. Finally, Section 6 summarizes and concludes our contribution.

## 1. Inequality in Income Distribution

As mentioned above, the unequal income distribution is a theme that has gained relevance both in the economic analysis and the political agenda, not only in developing emerging market or transition economies, but also in developed economies. Although in the past, the study of income distribution was focused on the sphere of the personal distribution, paying special attention to the income distribution between rich and poor individuals, in the last decades the study of the functional income distribution has flourished, and a high number of contributions focus on the evolution of labour shares in developed economies.

The emergence of these studies is based on the strong decline of labour incomes recorded in most advanced economies in the last decades of the last century; a decline that takes place in the context of increase in the size of salaried working population. As Philip Arestis, Jesús Ferreiro, and Carmen Gómez (2020a) show, since the decade of the seventies the size of labour income has declined in most European countries.

Many recent studies argue that the rising income inequality registered in functional and personal income distribution (Thomas Piketty 2014; Anthony B. Atkinson 2015; Arestis and Ana Rosa Gonzalez-Martinez 2016; Facundo Alvaredo et al. 2017; Pasquale Tridico 2017), is a source of macroeconomic problems, affecting the economic growth and the macroeconomic and financial stability (Arestis and Carolina Troncoso Baltar 2017; Tridico 2017; Kosta Josifidis and Novica Supić 2018; Davide Furceri and Jonathan D. Ostry 2019; Marzia Ippolito and Lorenzo Cicatiello 2019; Brian Nolan and Luis Valenzuela 2019). In this sense, many studies claim that the rising income inequality in combination with the financialization process (interrelated phenomena) have played a key role in the generation of the Global Financial Crisis and the subsequent Great Recession (Engelbert Stockhammer 2013; Arestis 2016; Tridico 2017).

Moreover, it must be emphasized that, although they are usually analysed as different problems, the rising inequality in the personal and the functional income distribution are interrelated phenomena. Thus, some studies argue that the decline in labour income is one of the main explanations of the rising inequality in the personal income distribution (Sean F. Ennis, Pedro Gonzaga, and Chris Pike 2019; Furceri and Ostry 2019; Nolan and Valenzuela 2019).

The existing literature on the factors driving inequality upwards, shares the argument that income inequality would be explained by a combination of different, but interrelated, elements, operating all of them in the same direction (Tali Kristal and Yinon Cohen 2017). Thus, the rising income inequality in advanced countries is attributed to the following factors: financialization, financial development, financial and trade globalization, technological (skill-based and task-based) change, demographic and household structures, small competition (market power) in labour and market products, manufacturing jobs decline, restrictive monetary policy, shocks, strategies and models of economic growth (economic growth being driven by labour, skills,

human capital and competences; also profit-led and export-led growth). In addition to political processes and behaviours, institutional inertia, changes and social conventions about inequality; macroeconomic policies, labour market institutions and regulations, macroeconomic conditions (mainly, inflation and unemployment rates), redistribution policies, changes in taxation, public spending and social policies, and immigration (Josifidis, Supić, and Emilija Beker Pucar 2017; Kristal and Cohen 2017; Anthony Roberts and Roy Kwon 2017; Manuel Carlos Nogueira and Óscar Afonso 2018; Elena Bárcena-Martín, Natalia Martín-Fuentes, and Salvador Pérez-Moreno 2019; Ennis, Gonzaha, and Pike 2019; Furceri and Ostry 2019; Nolan, Matteo G. Richiardi, and Valenzuela 2019; Nolan and Valenzuela 2019; Natalija Novta and Evgenia Pugacheva 2019; Josifidis, Supić, and Slađana Bodor 2020; Göran Therborn 2020; Tridico 2020).

## 2. Labour Flexibility and Income Inequality

Since the eighties decade, many developed and emerging economies have approved labour market reforms with the objectives to reduce the rates of unemployment and increase the rates of growth of employment. These reforms were based on the belief that the existence of rigidities in the labour market discourages employment creation and contribute to generate and maintain high unemployment rates (Ferreiro and Gómez 2017; Tridico and Ricardo Pariboni 2017; Emiliano Brancaccio, Nadia Garbellini, and Raffaele Giammetti 2018; Adriana D. Kugler 2019; Stephen McBride and James Watson 2019).

Many countries have approved in the last decades labour reforms that focused on employment protection legislation (EPL), that 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. In this sense, many countries have approved different measures curbing firing costs and reducing the restrictions on the use of non-standard (fixed-term, part-time, temporary work agency) 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 this kind of contracts (in comparison with those for permanent contracts), thereby giving rise to a segmented or dual labour market with a rising share of atypical (that is, non-permanent full-time employment contracts). The objective of these measures was to palliate the negative impact of economic crisis on employment, a negative impact that was much more intense in those economies that were implementing austerity policies to avoid the negative impact of the crisis on public accounts (Ferreiro and Gómez 2017; Giorgio Liotti 2020).

However, despite the spread of these reforms, the empirical analyses have not been able to prove the presumed positive impact of these reforms on labour markets performance. The empirical evidence is far from conclusive, and recent studies conclude that employment protection does not generate a negative impact on employment or unemployment rates (Sabina Avdagic and Paolo Salardi 2013; Stockhammer, Alexander Guschanski, and Karsten Köhler 2014; Avdagic 2015; Tito Boeri, Pierre Cahuc, and André A. Zylberberg 2015; Peter Gal and Adam Theising 2015; Giuseppe Bertola 2017; Organisation for Economic Co-operation and Development - OECD 2018; Kugler 2019; Arestis, Ferreiro, and Gómez 2020a, b).

Indeed, many studies argue that labour market institutions, including employment protection, do have a positive impact on labour market (helping to solve market imperfections in the labour market) and economic activity in terms of lower unemployment, smoothing fluctuations of economic activity, income distribution and employment, a decline in functional and personal income inequality, a higher accumulation of human and physical capital, and promoting innovative activities (European Commission 2015; Giovanni Dosi et al. 2017, 2018; Marc Lavoie 2017; Brancaccio, Garbellini, and Giammetti 2018; Gabriele Ciminelli, Romain Duval, and Furceri 2018; Kugler 2019).

Following this approach, a rising number of studies conclude that the reforms in the labour market that have tried to make it more flexible have had microeconomic and macroeconomic negative consequences, like a higher labour segmentation, a deterioration in the job quality, unsustainable increase in the household consumption and borrowing, a more inegalitarian personal income distribution, the generation of disincentives to innovation and physical and human capital accumulation, negative impact on productivity growth, higher poverty rates, etc. (Alfred Kleinknecht et al. 2013; Jason Heyes and Paul Lewis 2015; Mireia Damiani, Fabrizio Pompei, and Andrea Ricci 2016; Tomás Gutierrez-Barbarrusa 2016; Tridico 2017; Brancaccio, Garbellini, and Giammetti 2018; OECD 2018; Liotti and Rosario Rita Canale 2020).

Focusing on the impact of labour market reforms on income distribution and inequality, a growing number of studies have focused on the effects generated on income inequality by reforms in the employment protection legislation approved since the eighties decade. In this sense, there is a general consensus that the reforms that have made the labour market more flexible have had a negative impact on income inequality; in particular on the size of labour and wage shares (Tridico 2017; Brancaccio, Garbellini, and Giammetti 2018; Ciminelli, Duval, and Furceri 2018; Dosi et al. 2018; OECD 2018; Zoe Adams et al. 2019; Daniela Bellani and Giulio Bosio 2019; Siyan Chen and Saul Desiderio 2019; Arestis, Ferreiro, and Gómez 2020a).

### 3. Theoretical Framework

The main objective of our paper is to analyse the impact of employment protection legislation on the evolution of the labour income share. To analyse the change in the size of labour income, that is, the changes in the functional income distribution, we use three different, although interrelated variables: the sum of wages and salaries as a percentage of the GDP, the compensation of employees as a percentage of the GDP, and the adjusted wage share. The use of three different measures of the labour income allows to get robust conclusions about the potential impact of employment protection on income distribution as far as this impact is not affected by the choice of the variable related to the income distribution.

According to National Accounts, defined by the income approach, GDP is the sum of uses in the total economy generation of income account, that is, the sum of compensation of employees, taxes on production and imports less subsidies, gross operating surplus and mixed income of the total economy. Following this approach, compensation of employees is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work undertaken by the latter during an

accounting period. Compensation of employees is made up of wages and salaries in cash and in kind plus employers' social contributions.

Therefore, to measure the relative size of labour income (as a percentage of the GDP), we can use two alternative measures: compensations of employees or wages and salaries. The difference between both variables is that the latter does not include employers' social contributions. In our study, we estimate the size of the compensations of employees and wages and salaries as percentage of the GDP using the data obtained in the Eurostat Annual National Account series (European Commission 2020a)<sup>1</sup>.

Besides these two concepts, we also use the concept of adjusted wage share (measured as percentage of GDP at current prices). Adjusted wage share is calculated as compensation per employee as percentage of GDP at market prices per person employed. It is important to note that in the estimation of the adjusted wage share, the number of employees and employed workers are measured as full-time equivalents. In this case, data for adjusted wage share has been obtained from the AMECO database (European Commission 2020b)<sup>2</sup>.

Using three alternative measures of labour income share, we can claim that the impact of any explanatory variable on the evolution of labour income is robust when this impact is significant, and with the same sign in all the equations estimated, which would differ on the variable used as dependent variable (i.e., compensation of employees, wage and salaries, and adjusted wage share).

The objective of this contribution is to study whether the employment protection legislation explains the changes recorded in the labour income share. From a mainstream perspective, a high level of employment protection is identified with a rigid labour market, and *vice versa*. Therefore, we implicitly test the hypothesis that the higher flexibility of labour markets recorded in the last decades is behind the recorded decline in the labour income share in Europe.

To estimate the effects on employment and unemployment rate changes of the protection of permanent and temporary workers, we have used the Employment Protection Legislation (EPL) strictness indexes elaborated by the OECD. The OECD EPL indexes measure the strictness of employment protection for permanent and temporary contracts, constructing a synthetic indicator based on the values attached to different items (the number of items depend on the version of the EPL indexes). The EPL indexes are classified into three main areas: (i) protection of regular workers against individual dismissal; (ii) regulation of temporary forms of employment (fixed-term and temporary agency workers); and (iii) additional, specific requirements for collective dismissals. Each indicator is measured on a 0 to 6 score, with higher values representing stricter regulation.

These indexes have several advantages. First, given that the methodology employed in the elaboration of the indexes is the same for all the countries, they allow

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<sup>1</sup> **European Commission.** 2020a. National Accounts. <https://ec.europa.eu/eurostat/web/national-accounts/data/database> (accessed August 05, 2020).

<sup>2</sup> **European Commission.** 2020b. AMECO Database. [https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database\\_en](https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en) (accessed August 05, 2020).

making a comparison of the strictness in the employment protection legislation among countries. In this sense, it could be interpreted that the countries with the highest scores (the stricter provisions on individual and collective dismissals) would be those with the highest rigidities in the labour market, and *vice versa*. Second, the changes in the labour law would imply a change in the value of the indexes. A labour law reform, relaxing the regulatory provisions on individual and collective dismissals, a measure making the labour market more flexible, would imply a decline of the score, and *vice versa*; with more intense reforms implying higher changes in the indexes.

The OECD calculates two basic indexes: one index measures the protection of regular-permanent workers against individual and collective dismissals, while the other index measures the regulation of temporary forms of employment (fixed-term contracts and temporary work agency employment). The first index is split into two indexes: one related to the protection of permanent workers against individual dismissal, and the other is related to the 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 of regular (permanent-indefinite) workers against individual dismissals;
- EPC: specific requirements for collective dismissals of permanent workers;
- EPT: strictness of regulation on the use of fixed-term and temporary work agency contracts.

Given that our objective is to analyse a panel of countries with the longest possible series of available years, we use versions 1 EPR and EPT indexes. The availability of data on the size of compensations of employees and the EPL indexes implies that the set of countries analysed is formed by 20 European countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, and United Kingdom). The analysed period covers 14 years, namely 2000 to 2013. Therefore, we have 280 country-years observations.

Some studies argue that the relationship between the employment protection and the labour market results is not a linear one, with adverse effects of employment protection coming from the existence of an excessive employment protection (OECD 2018; Arestis, Ferreiro, and Gómez 2020). Therefore, we test the hypothesis of the existence of a quadratic non-linear relation between the level of employment protection (the level of the EPT and EPR indexes) and the changes in the size of the compensation of employees.

The evolution of the labour income share can be affected by changes in economic activity and labour market. Therefore, our model includes three macroeconomic variables that can affect the functional income distribution: the rate of growth or real GDP, the rate of growth of employment, and the growth (in percentage points) of unemployment rate. In the case of the economic growth, the rate of growth of real GDP has been calculated using data from real GDP (at 2015 reference levels, obtained from

the AMECO database). Data on employment growth and unemployment rate have been obtained from the International Labour Organization (2020)<sup>3</sup> database.

Our model also includes as explanatory variable the rate of growth of real wages. This variable has been calculated using the data on real compensation per employee, provided at the AMECO database. Furthermore, we have also included as independent variables the trade balance (exports minus inputs of goods and services) and the trade openness (exports plus inputs of goods and services), both variables measured as percentages of GDP. Trade openness is used as a proxy of the impact of globalization on income distribution, and trade balance is used as a proxy of the competitiveness of an economy. Whilst a high trade openness can affect the functional income distribution via a higher degree of competition in international markets, a high trade balance can be pursued and achieved *via* a higher pressure on wage growth (an internal devaluation), thus contributing to a decline in the wage shares.

By including in the same equation the EPL indexes and the growth of employment, unemployment rates and real wages, we assume that the impact of EPL acts through an autonomous channel. Ferreiro and Gómez (forthcoming) conclude that employment protection legislation is not a significant determinant of the dynamics of employment and unemployment rates. In this sense, Arestis, Ferreiro, and Gómez (2020b) conclude that, although EPL is not a significant determinant of the evolution of employments, however, it does have a significant impact on the evolution of temporary employment, contributing to generate a segmented labour market.

Therefore, as far as employment protection legislation may have different impacts on certain groups of workers, in terms not only of the kind of employment contract (temporary *versus* permanent ones, part-time versus full-time ones) but also on the characteristics of the workers (gender, skills, age, etc.); EPL may affect the evolution of labour incomes shares if it affects the employment and/or earnings of those groups of workers.

In order to control the potential influence of other variables on income distribution, we have included in the models two indexes that proxy the labour market regulation and business and product regulation: the Labour Market Regulations (LMR) index and the Business Regulations (BR) index. These indexes are part of the Economic Freedom (2020a)<sup>4</sup> index elaborated by the Fraser Institute, namely of the index related to the area Regulation. Each index is scored on a scale of 0 to 10, with a higher rating indicating a greater degree of economic freedom.

The LMR index measures the restrictions affecting the economic freedom of employees and employers. These restrictions concern the regulations in relation to minimum wage, firing and firing regulations, centralized collective bargaining, hours regulations, mandated cost of worker dismissal, and conscription. According to the Fraser Institute, “in order to earn high marks in the component rating regulation of the labor market, a country must allow market forces to determine wages and establish the

<sup>3</sup> **International Labour Organization.** 2020. Statistics and Databases. <https://www.ilo.org/global/statistics-and-databases/lang--en/index.htm> (accessed July 08, 2020).

<sup>4</sup> **Economic Freedom.** 2020a. Economic Freedom Rankings. <https://www.fraserinstitute.org/economic-freedom/dataset?geozone=world&page=dataset&min-year=2&max-year=0&filter=0> (accessed July 05, 2020).

conditions of hiring and firing, and refrain from the use of conscription”. The BR index is “designed to identify the extent to which regulations and bureaucratic procedures restrain entry and reduce competition. In order to score high in this portion of the index, countries must allow markets to determine prices and refrain from regulatory activities that retard entry into business and increase the cost of producing products. They also must refrain from ‘playing favorites’, that is, from using their power to extract financial payments and reward some businesses at the expense of others”. The rating in this index is based on the scores attached to elements like administrative requirements, bureaucracy costs, starting a business, extra payments/bribes/favouritism, licensing restrictions, and cost of tax compliance (Economic Freedom 2020b)<sup>5</sup>.

In sum, introducing these two indexes we are controlling the potential influence of the regulation of labour markets and business, as well as goods and services on the evolution of income distribution.

Some studies argue that the relationship between the employment protection and the labour market results is not linear, with negative effects of employment protection on employment and unemployment occurring when there is an excessive protection (Arestis, Ferreiro, and Gómez 2020b). Consequently, we run two different models. In the first type of model we test a linear relationship between the explanatory variables and the variable measuring the evolution of the labour income. In the second type of model we test the existence of a non-linear quadratic relationship between the labour income share and the variables related to the employment protection, the trade openness and the trade balance, as well as the BR and LMR indexes.

Therefore, the two models we test are:

$$\Delta Labour\ income\ share_{i,t} = \beta_0 + \beta_1 \Delta X_{i,t} + \beta_2 \Delta Real\ wages_{i,t} + \beta_3 EPR_{i,t} + \beta_4 EPT_{i,t} + \beta_5 BR_{i,t} + \beta_6 LMR_{i,t} + \beta_7 Trade\ balance_{i,t} + \beta_8 Trade\ openness_{i,t} + \epsilon_{i,t}, \quad (1)$$

$$\begin{aligned} \Delta Labour\ income\ share_{i,t} = & \beta_0 + \beta_1 \Delta X_{i,t} + \beta_2 \Delta Real\ wages_{i,t} + \beta_3 EPR_{i,t} + \\ * & \beta_4 EPR_{i,t}^2 + \beta_5 EPT_{i,t} + \beta_6 EPT_{i,t}^2 + \beta_5 BR_{i,t} + \beta_6 BR_{i,t}^2 + \beta_7 LMR_{i,t} + \beta_8 LMR_{i,t}^2 + \\ & \beta_9 Trade\ balance_{i,t} + \beta_{10} Trade\ balance_{i,t}^2 + \beta_{11} Trade\ openness_{i,t} + \\ & \beta_{12} Trade\ openness_{i,t}^2 + \epsilon_{i,t}, \end{aligned} \quad (2)$$

where we use the three above mentioned variables to measure the change of the labour income share as a percentage of the GDP, namely, compensation of employees, wages and salaries and adjusted wage share, and  $\Delta X_{it}$  include the three above mentioned macroeconomic variables: the rate of growth of real GDP, the rate of growth of employment, and the growth of unemployment rate.

## 4. Empirical Framework

Table 1 shows the main descriptive statistics of the variables included in our model. Regarding the dependent variable, the evolution of the labour income share, we must highlight the existing differences among the three variables used in the analysis. Thus,

<sup>5</sup> **Economic Freedom.** 2020b. <https://www.fraserinstitute.org/economic-freedom/approach> (accessed July 12, 2020).



the mean of the growth of the compensation of employees register a positive sign, although it is close to zero. This implies that the size of the compensation of employees remained almost constant during the period analysed. On the contrary, the growth of the wages and salaries and the adjusted wage share recorded a negative sign, implying that the labour income share declined during this period, with a largest decline in the case of the adjusted wage share.

**Table 1** Descriptive Statistics of Explained and Explanatory Variables

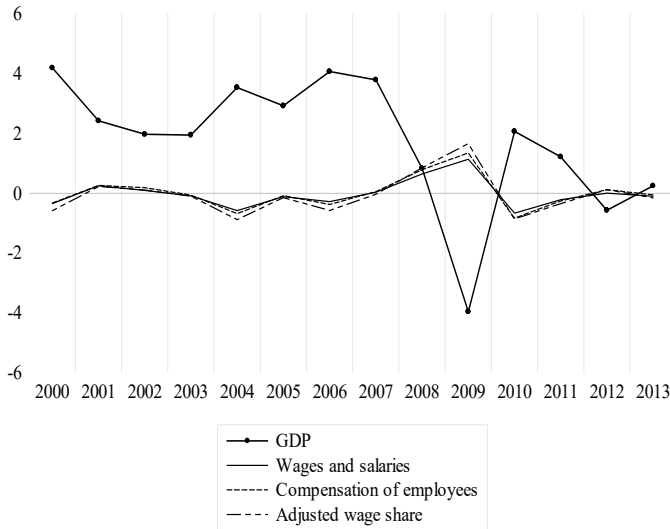
	Mean	Median	Maximum	Minimum	Std. dev.
Growth of compensation of employees	0.003	-0.016	4.369	-5.356	0.998
Growth of wages and salaries	-0.016	-0.090	3.568	-4.600	0.830
Growth of adjusted wage share	-0.053	-0.130	4.670	-5.904	1.183
GDP growth	1.761	1.950	10.832	-9.133	2.856
Employment growth	0.514	0.577	5.967	-8.657	1.996
Unemployment rate growth	0.159	0.039	6.602	-4.239	1.342
Real wages growth	1.186	1.028	9.125	-9.137	2.023
EPR index	2.370	2.333	4.583	1.095	0.658
EPR index	1.702	1.437	4.750	0.250	0.975
BR index	6.991	7.000	8.682	4.440	0.927
LMR index	6.141	6.213	8.477	2.940	1.282
Trade balance	2.138	2.400	18.800	-12.600	5.910
Trade openness	93.516	82.200	191.500	45.400	37.791

Source: Own construction.

These differences support our decision to analyse separately the determinants of the evolution of the labour income share using the three aforementioned variables. The reason is that an explanatory variable can have a different impact depending on the variable used as dependent variable.

We must highlight that the decline (or maintenance) of the labour income share takes place in a context of economic growth, increase of employment and rising real wages, as Figure 1 shows. The decline in the size of labour incomes in this context of economic growth implies that either the economic growth leads to a decline in the share of labour incomes, with economic growth favouring the size of capital income, or that there are other elements that affect the share of labour incomes. In this sense, it is remarkable that the largest rise in the size of the labour income shares took place in the year 2009, when GDP declined 4%.

Our analysis could be affected by the existence of high correlation between the explanatory variables, which could give rise to a problem of multicollinearity. Table 2 shows the matrix of correlations between the explained and explanatory variables included in our analysis. Data of Table 2 shows a high correlation (-0.829) between the employment rate of growth and the growth of unemployment rates, a value that is above the value (0.8 in absolute value) that indicates the existence of collinearity between these two variables (Peter Kennedy 2008).



Source: Our estimations.

**Figure 1** Average Growth of Labour Income Share (as Percentage of GDP) and Average GDP Growth Rate

**Table 2** Matrix of Correlations

	Growth of compensation of employees	Growth of wages and salaries	Growth of adjusted wage share	GDP growth	Employment growth	Unemployment rate growth	Real wages growth	EPR	EPT	BR index	LMR index	Trade balance	Trade openness
Growth of compensation of employees	1.000												
Growth of wages and salaries	0.966	1.000											
Growth of adjusted wage share	0.955	0.921	1.000										
GDP growth	-0.314	-0.300	-0.352	1.000									
Employment growth	0.068	0.078	0.012	0.640	1.000								
Unemployment rate growth	-0.026	-0.036	0.032	-0.644	-0.829	1.000							
Real wages growth	0.489	0.469	0.529	0.364	0.076	-0.109	1.000						
EPR	-0.008	-0.017	-0.021	-0.080	-0.107	0.012	-0.024	1.000					
EPT	0.021	0.006	-0.001	-0.099	0.014	-0.001	-0.158	0.322	1.000				
BR index	-0.074	-0.095	-0.060	0.012	0.085	-0.040	-0.153	-0.440	-0.190	1.000			
LMR index	0.024	0.032	0.050	0.050	0.041	-0.010	0.119	-0.487	-0.557	0.089	1.000		
Trade balance	-0.066	-0.054	-0.050	-0.009	0.109	-0.029	-0.130	-0.412	-0.376	0.553	0.264	1.000	
Trade openness	-0.034	-0.005	-0.027	0.161	0.077	-0.064	0.127	-0.293	-0.452	0.066	0.528	0.474	1.000

Source: Own construction.

To detect the existence of multicollinearity, we have carried out a variance inflation factor (VIF) test. A high VIF would indicate the existence of multicollinearity. Despite that there are not formal thresholds, which allow to conclude that above that specific value we face a problem of multicollinearity, it is commonly accepted a value of VIF higher than 10 (Kennedy 2008; Jeffrey M. Wooldridge 2013). As can be seen in Table 3, the highest values of VIF are 3.4 (for the rate of growth of employment) and 3.2 for the growth of unemployment rate. Although these values can be considered as low or moderate, given the high partial correlation between both variables, for each equation we will test separately the impact of the employment growth and the growth of unemployment rate.

**Table 3** Variable Inflation Factor

	Centered VIF
GDP growth	1.99
Employment growth	3.40
Unemployment rate growth	3.20
Real wages growth	1.28
EPR	1.35
EPT	1.20
BR index	1.15
LMR index	1.18
Trade balance	1.54
Trade openness	1.60

Source: Own construction.

**Table 4** Determinants of the Growth of Labour Shares

	Growth of compensation of employees				Growth of wages and salaries					Growth of adjusted wage share			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Constant	0.516 (1.210)	-3.673 (2.534)	0.010 (1.304)	-7.778*** (2.722)	-0.050 (1.153)	-3.330 (2.238)	0.544 (1.750)	-0.527 (1.278)	-6.702*** (2.394)	-0.322 (1.105)	-3.467 (2.302)	-0.911 (1.170)	-7.900*** (2.593)
GDP growth	-0.331*** (0.026)	-0.317*** (0.026)	-0.284*** (0.031)	-0.273*** (0.030)	-0.260*** (0.024)	-0.251*** (0.024)	-0.304*** (0.015)	-0.218*** (0.027)	-0.213*** (0.026)	-0.403*** (0.026)	-0.301*** (0.026)	-0.351*** (0.032)	-0.342*** (0.030)
Employment growth	0.314*** (0.027)	0.310*** (0.028)			0.257*** (0.025)	0.254*** (0.025)	0.286*** (0.021)			0.337*** (0.028)	0.334*** (0.028)		
Unemployment rate growth			-0.361*** (0.047)	-0.379*** (0.048)				-0.287*** (0.039)	-0.306*** (0.040)			-0.382** (0.049)	-0.406*** (0.050)
Real wages growth	0.365*** (0.017)	0.370*** (0.018)	0.340*** (0.022)	0.344*** (0.020)	0.286*** (0.016)	0.287*** (0.016)	0.296*** (0.015)	0.265*** (0.019)	0.266*** (0.019)	0.457*** (0.015)	0.463*** (0.016)	0.430*** (0.022)	0.436*** (0.021)
EPR	-0.122 (0.295)	0.561 (0.917)	0.135 (0.329)	0.444 (1.043)	-0.015 (0.264)	0.233 (0.837)	-0.314 (0.274)	0.199 (0.296)	0.146 (0.964)	0.095 (0.283)	0.833 (0.972)	0.374 (0.316)	0.712 (1.094)
EPR <sup>2</sup>		-0.075 (0.121)		0.022 (0.144)		-0.003 (0.105)	0.029 (0.042)		0.075 (0.127)		-0.077 (0.131)		0.027 (0.158)
EPT	0.101 (0.102)	0.560** (0.219)	0.259** (0.126)	0.575*** (0.211)	0.057 (0.084)	0.220 (0.200)	0.064 (0.155)	0.187* (0.109)	0.236 (0.208)	0.051 (0.094)	0.426** (0.178)	0.221* (0.125)	0.444** (0.199)
EPT <sup>2</sup>		-0.094** (0.042)		-0.073* (0.040)		-0.032 (0.039)	-0.005 (0.036)		-0.015 (0.040)		-0.084*** (0.029)		-0.061* (0.034)
BRI	-0.080 (0.098)	0.292 (0.500)	0.016 (0.100)	1.458*** (0.516)	-0.010 (0.097)	0.415 (0.461)	-0.194 (0.413)	0.071 (0.103)	1.358*** (0.471)	0.024 (0.092)	0.292 (0.405)	0.129 (0.100)	1.542*** (0.433)
BRI <sup>2</sup>		-0.029 (0.027)		-0.106*** (0.035)		-0.031 (0.031)	0.010 (0.029)		-0.092*** (0.031)		-0.023 (0.029)		-0.105*** (0.029)
LMRI	0.026 (0.073)	0.378 (0.334)	-0.026 (0.081)	0.348 (0.361)	0.043 (0.068)	0.331 (0.278)	-0.002 (0.215)	0.001 (0.075)	0.309 (0.310)	-0.013 (0.064)	-0.091 (0.357)	-0.007 (0.006)	-0.122 (0.380)
LMRI <sup>2</sup>		-0.030 (0.027)		-0.033 (0.029)		-0.025 (0.023)	-0.004 (0.018)		-0.028 (0.025)		0.005 (0.028)		0.002 (0.031)
Trade balance	-0.033** (0.016)	-0.030* (0.017)	-0.032* (0.019)	-0.022 (0.019)	-0.020 (0.013)	-0.014 (0.015)	-0.014 (0.010)	-0.020 (0.016)	-0.008 (0.018)	-0.031* (0.016)	-0.025* (0.015)	-0.031 (0.021)	-0.017 (0.019)
Trade balance <sup>2</sup>		-0.001 (0.001)		-0.002 (0.002)		-0.001 (0.001)	0.001 (0.001)		-0.002* (0.001)		-0.002 (0.001)		-0.003* (0.002)

Trade openness	0.001 (0.005)	0.007 (0.016)	-0.005 (0.006)	0.008 (0.018)	-0.002 (0.004)	0.003 (0.016)	0.020*** (0.007)	-0.007 (0.006)	0.004 (0.017)	-0.001 (0.005)	0.017 (0.0149)	-0.007 (0.007)	0.019 (0.018)
Trade openness <sup>2</sup>		-0.000 (0.000)		0.000 (0.000)		0.000 (0.000)	0.000*** (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)
Cross-section effects	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Random	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Period effects	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Random	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
R <sup>2</sup>	0.837	0.843	0.789	0.804	0.798	0.802	0.754	0.747	0.762	0.894	0.900	0.853	0.867

Notes: Robust standard error in parentheses. \*  $p$ -value < 0.1; \*\*  $p$ -value < 0.05; \*\*\*  $p$ -value < 0.01.

Source: Own construction.

## 5. Empirical Investigation

Our estimations use a panel data model with cross-section and period fixed effects<sup>6</sup>. European economies are highly interrelated; therefore, they may be affected by common shocks, such as the Global Financial Crisis and the subsequent Great Recession. The Pesaran CD cross-section dependence panel test shows the existence of cross-section dependence<sup>7</sup>. Therefore, we apply SUR estimators to correct the contemporaneous correlation between cross-sections.

Table 4 shows the results of our estimations. As expected, the growth of employment and the decline of unemployment rates have a positive impact on the labour income share, contributing to rise its size. This is a robust result, which is not affected by the changes in the explanatory variables included in the equations, the testing of a linear or not linear relationship, or the choice of the variable related to the dynamics of the functional income distribution.

As far as the impact of the evolution of employment and unemployment rates, the rise of employment and the decline of unemployment rates contribute to rise the labour share, and *vice versa*.

Regarding the growth of real wages, it has a positive significant impact on the evolution of labour share. A rise in real wages implies a rise in the size of the labour share. This is a robust result, which is not affected by the different specifications of the models.

Economic growth is a significant determinant of the evolution of the size of compensation of employees having a negative impact. The higher economic growth, the largest the decline in labour income share. This is a robust result, which happens in all the estimated equations. These results support the conclusions reached by Arestis, Ferreiro, and Gómez (2020b) about the short- and long-term effects of economic growth on income distribution. From a business cycle perspective, it implies that labour share declines during booms but increases during recessions. From a long-term perspective, taking into account the positive average rate of growth of the GDP during the period of analysis (+1.8%), which implies that the model of economic growth prevailing in Europe since the 2000s operates against labour income. We can then account

<sup>6</sup> Redundant fixed-effects tests confirm the existence of cross-section and period fixed effects. The Hausman tests confirm the validity of the implementation of a fixed-effects model. The only exception is shown in column 7. Also, the Hausman test confirms that the use of random effects is appropriate in the equation that includes the growth of wages and salaries as dependent variable and the use of employment growth as explanatory variables, and when we test the existence of a non-linear relationship with the explained variable. Data available upon request.

<sup>7</sup> Data available upon request.

for a model of growth based on a decline of labour income and the consequent rise in capital income (Eckhard Hein 2019).

Trade openness does not have a significant effect on the evolution of labour income share. It is only significant when the dependent variable is the growth of wages and salaries and random effects as used in our model. However, the value of the coefficients are close to zero; therefore, this result cannot be considered as robust. It is important to note that this result happens in a context of strong increase in the size of trade flows. Thus, in the European Union (EU-28), the sum of exports and imports of goods and services rose from 54.3% of GDP in 1995 to 82.9% of GDP in 2013. Therefore, our results do not support the hypothesis that the process of globalization has had a negative impact on the size of labour income in the European countries.

Regarding the trade balance, our results show the existence of an inverse linear relationship with the evolution of labour shares. This relation is more evident when employment growth is used as an explanatory variable. The sign of the coefficient is negative, implying that a trade balance surplus leads to a decline of labour share. However, we must highlight that this relationship is significant only in the case of the compensation for employees and the adjusted wage share, but not in the case of wages and salaries. The difference between compensation of employees (and adjusted wage share) and wages and salaries is that the former measure of labour income includes social contributions paid by employers. A possible explanation of this result is that the improvements in competitiveness leading to a decline in trade deficit or a higher trade surplus may be associated not with a decline in real wages but with a decline in social security contributions of wage deflations, with the consequent negative impact on the size of compensation of employees. In other words, national governments should have used the reduction in social contributions as a measure to reduce total labour costs and to gain competitiveness.

In the case of the Business Regulation index, we have found a non-linear relation with the growth of labour shares. The value of the coefficients implies that the BR index exerts a positive though decreasing effect on the growth of the labour share. It should be noted that this effect is not affected by the choice of the variable used to measure the size of labour share. However, the impact is only significant when the growth of unemployment rate is included in the equation, and, therefore we cannot claim that the result is robust. Given the values of the coefficients, the threshold above which the index generates a negative marginal impact is 6.88 for the compensation of employees, 7.38 for the wages and salaries, and 7.34 for the adjusted wage share. According to the data of Table 1, the mean and median values of the BR index is 7. This implies that many countries are above this threshold: 13 out of the 20 countries studied exceeded the threshold (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Norway, Portugal, Sweden, Switzerland, and the United Kingdom). In these countries, a more flexible treatment of business regulation would have a smaller positive impact on the evolution of the labour income.

Regarding the Labour Market Regulation index, it never has a significant impact on the evolution of labour share. Consequently, we cannot argue that a more flexible or rigid labour market generates an income distribution more or less favourable to labour income. This does not mean that a certain aspect of labour market regulation

has no impact on income distribution. It may well happen that a certain type of regulation could have a positive impact; however, this positive impact on employment would be offset by the negative impact generated by other kind of regulation.

Finally, regarding the impact on labour shares of the employment protection, the results are different for the employment protection for regular workers (EPR index) and the constraints to the use of fixed-term and temporary agency work contracts (EPT index). Employment protection for regular workers does not have a significant impact on the evolution of labour shares. This is a robust result in that it happens in all the equations estimated and for the three determinant variables.

The results are different for the constraints in the use of fixed-term and temporary agency work contracts (the EPT index). Employment protection for temporary workers has a significant and direct impact on the evolution of the size of compensation of employees. This impact is clearly detected in the equations where the relationship between the growth of the labour share and the EPT index adopts a quadratic form, with the result that it has a decreasing marginal effect. In the estimation of the determinants of the growth of compensation of employees, the threshold is 2.98 in the equation that includes as explanatory variable the growth of employment and 3.94 in the equation that includes the growth of unemployment rates. In the estimation of the determinants of the growth of the adjusted wage share, these thresholds are, respectively, 2.54 and 3.64. In any case, given that the EPT index ranges from 0 to 6, employment protection for temporary workers always has a positive impact on the labour income share.

Nonetheless, these results must be taken with caution for two reasons. The first one has to do with the differences in the value of the coefficients between the equations that include as explanatory variables the employment growth and the growth of unemployment rate. The differences in the threshold corresponding to the EPT indexes amount to 1 point, a large figure given that the mean of the EPT index amounts to 1.7 (see Table 1). This means that it is very difficult to say whether a country is above or below this threshold, and, consequently, to estimate the true impact on the evolution of the labour shares of a change in the employment protection for temporary workers. The second reason is that the above effect only takes place when we analyse the determinants of the evolution of the size of compensation of employees and the adjusted wage share. The significant impact vanishes when we analyse the determinants of the growth of the size of wages and salaries. Now, the EPT is only significant when we study its impact testing a linear relation and we use the growth of unemployment rates as explanatory variables. Although the sign of the coefficient is positive, like in the equations for the compensation of employees and adjusted wage share, when the impact of employment growth is analysed, the significant impact disappears.

In sum, our result show that, although it is difficult to reach an irrefutable conclusion about the precise impact of the employment protection for temporary workers, we can argue that the constraints to the use of temporary workers seem to have a positive impact on the evolution of the labour size. Also, the existence of stronger constraints to the use of temporary employment contracts contributes to the rise of the size of labour shares.

In this sense, the labour market reforms that have facilitated the use of temporary employment contracts would have a negative impact on the size of labour income in the European Union. We must note that out of the 20 countries we have analysed, comparing the values of the EPT index in 2000 and 2013, the index remained constant in 8 countries (Austria, Belgium, Denmark, Finland, France, Netherlands, Norway, Switzerland), rose in 6 countries (Czech Republic, Hungary, Ireland, Poland, Slovakia, and United Kingdom), and declined in the remaining 6 countries (Germany, Greece, Italy, Portugal, Spain and Sweden).

## 6. Summary and Conclusions

Our paper has analyzed the determinants of the change of labour income in a set of twenty European Union countries over the years 2000 to 2013. We have focused our analysis on the study of the impact of employment protection on the dynamics of labour shares. In order to get robust results, we have tested three models in which we have used three measures of the labour share: the compensation of employees, the sum of wages and salaries, and the adjusted wage shares.

Our results show that economic growth, employment growth, growth of unemployment rates, and growth of real wages, are robust and significant determinants of the evolution of labour income shares in the European Union countries. As expected, the growth of employment and real wages and the decline in unemployment rates contribute to the rise of the size of labour shares. On the contrary, economic growth contributes to reduce the size of labour income. Relevant evidence is portrayed that the model of economic growth in the period analysed contributed to the rise of the share of capital income.

If we focus on the variables related to the flexibilization of the labour market, namely the LMR, the EPR and the EPT indexes, it is very clear that the LMR and the EPR indexes are not significant determinants of the growth of labour income.

This is not the case of the EPT index. Our results show that, if any, the existence of constraints to the use of temporary employment contracts would have a positive impact on the size of labour income. Therefore, the reforms implemented to facilitate the use of these kind of contracts would have a negative impact on the size of labour income shares.

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