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# Employment Protection Legislation and Labour Income Shares in Europe

**Summary:** The paper analyses the determinant elements of the evolution of labour income share, measured by the size of compensation of employees as a percentage of GDP in twenty European economies. In doing so, special attention is paid to the impact of employment protection legislation. 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 employment protection, only employment protection for temporary workers matters. Our results shows that stricter provisions on the use of fixed-term and temporary agency contracts have a positive impact on the growth of the labour shares.

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

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

The issue of income inequality has come to the fore as one of the main problems affecting developed economies in recent years. Traditionally, the field of income distribution and inequality was confined to the study of development economics. In his seminal work, Simon Kuznets (1955) argued that there was a close relationship between the inequality in income distribution and the level of development of the countries. This relationship adopted the form of an inverted U-shape curve, with the highest levels of inequality taking place in middle-income countries. In this sense, income (and wealth) distribution would not be a (central) problem in advanced and industrialized economies. In these economies, income distribution would be more egalitarian as a result of more egalitarian market income distribution and an active role played by the public sector thanks to the redistributive policies based on the interplay of taxes, transfers and social spending.

However, recent studies have shown that income distribution is also a problem in advanced economies. These studies focus not so much on the level of inequality of income distribution in advanced economies and in its comparison with the inequality registered in developing and emerging economies, but on the evolution of the inequality in recent decades. The basis of the relevant analysis is the increase in income

inequality that most advanced economies have experienced in the last three or four decades (Thomas Piketty 2014; Anthony B. Atkinson 2015; Philip Arestis and Ana Rosa González-Martínez 2016; Facundo Alvaredo et al. 2017; Pasquale Tridico 2017).

The empirical verification of the rising inequality in advanced economies has led to a growing literature on the causes of the rising inequality and on the adverse consequences on the economic growth and the macroeconomic and financial stability. Although both elements are interrelated, most theoretical and empirical contributions have studied the issue of the income distribution focusing on the inequality in personal income distribution and on the changes in functional distribution, analysing in many cases the evolution of the labour shares in the economic activity.

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. The paper is structured as follows. First section analyses the evolution of the labour income share in advanced economies during the last decades. Second section analyses the impact on income distribution of labour institutions, and focuses on employment protection legislation. Third section presents our empirical model. Fourth section presents the results of our empirical analysis. Final section summarizes and concludes.

## 1. Labour Shares in Advanced Economies

Table 1 shows the evolution of the size of the labour incomes, measured by the adjusted labour share, in seventeen advanced economies over the period 1960-2018. The data show a generalized process of decline in the size of the share of labour income in the GDP, with only two exceptions, Belgium and Luxembourg. However, the data also shows the existence of a break point in the long-term trend of the labour share. Thus, over the period 1960-1976, the labour share rose in most advanced economies, with only three exceptions, Canada, Greece and Italy. By contrast, the labour share has declined in all the economies since 1977<sup>1</sup>. These data show that the decline in the labour income share is a structural process that become general in the decade of the seventies.

It is important to note that the decline in the labour share affected all economies in the years 1977 to 2007, with declines ranging from 2.4 percentage points of GDP in the United Kingdom to 24.9 percentage points in Portugal. However, since the onset of the Global Financial Crisis and the subsequent Great Recession, the evolution of the labour shares shows a mixed evidence, with nine economies showing a decline and the remaining eight countries recording an increase in the labour share<sup>2</sup>.

This downwards trend in the size of the labour share in developed economies is also registered in other countries for which the span of available data is shorter. Thus, according to the data in the AMECO database (European Commission 2020), the

<sup>1</sup> In most countries, the size of the wage share peaked in mid-seventies: Denmark, Ireland, the Netherlands, Portugal, the United Kingdom in 1975; Spain in 1976; Austria, France, Luxembourg and Norway in 1977; Sweden in 1978. The exceptions are Belgium (1981), and Greece, Italy (1960), Canada (1961), Finland (1966) and USA (1970).

<sup>2</sup> We must note that in some of these countries, the wage share is falling in the most recent years: in the Netherlands since 2012, in Austria and Sweden since 2013, and in Norway since 2016.

labour share peaked in Australia in 1974, Germany in 1992, Japan in 1980, Korea in 1973, Malta in 1993, and New Zealand in 1986.

**Table 1** Change in the Adjusted Labour Share as Percentage of GDP at Current Prices

	1960-2018	1960-1976	1977-2018	1977-2007	2008-2018
Austria	-9.61	1.12	-9.98	-11.79	0.89
Belgium	4.16	8.80	-4.84	-6.15	-0.29
Canada	-6.60	-1.67	-5.04	-5.38	0.66
Denmark	-1.39	4.22	-5.37	-5.64	-0.54
Finland	-14.32	1.83	-14.35	-14.91	-0.84
France	-4.01	3.56	-7.93	-10.80	2.61
Greece	-25.82	-24.15	-4.23	-2.52	-2.19
Ireland	-30.44	0.16	-27.63	-13.53	-18.20
Italy	-15.00	-2.50	-12.57	-13.31	-0.10
Luxembourg	5.40	9.71	-8.29	-12.09	1.32
Netherlands	-0.88	10.31	-11.78	-13.43	1.01
Norway	-8.74	3.34	-12.12	-16.33	4.76
Portugal	-12.03	22.83	-28.88	-24.90	-4.57
Spain	-7.47	6.17	-13.10	-10.99	-4.06
Sweden	-2.68	3.18	-7.59	-9.54	1.11
United Kingdom	-5.75	0.07	-2.53	-2.43	0.49
United States	-6.66	-2.23	-4.48	-2.27	-2.34

Source: Own construction, based on AMECO database (European Commission 2020)<sup>3</sup>.

Although it is not the focus of our paper, it must be highlighted that the redistribution of income in favour of profits and capital income has come in parallel with a higher inequality in the personal income distribution in favour of the few (Tridico 2017; Davide Furceri and Jonathan D. Ostry 2019; Brian Nolan, Matteo G. Richiardi, and Luis Valenzuela 2019; Nolan and Valenzuela 2019). Indeed, some studies argue that one of the key reasons behind the rising inequality in personal income distribution is the decline in the wage share, because for most people, mainly the poorest people, labour income is the most important, if not the only, source of income (Sean F. Ennis, Pedro Gonzaga, and Chris Pike 2019; Furceri and Ostry 2019; Nolan and Valenzuela 2019). Regardless the indexes used to measure the inequality and its change over the time (Gini index, top 1%, top 10%, S90/S10 income quintile share ratio, etc.), studies show a generalized rising income inequality with rising concentration of income and wealth among the richest people.

The rising concern on the upwards trend of income inequality is based on the confirmation of the negative consequences generated by income inequality. Namely, lower economic growth, economic instability and financial crisis, larger economic and political instability following external shocks, weaker support for growth-enhancing reforms, higher poverty, higher deprivation and social exclusion, stagnation of middle-classes income, high crime, bad health and lower life expectancy, negative

<sup>3</sup> **European Commission.** 2020. 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 January 10, 2020).

consequences on families (lower formation and higher dissolution of families, lower fertility rates, lower number of marriages), unequal distribution of political power, lower intergenerational mobility, growth of populism and populist policies, erosion of trust in institutions and democracy, etc. (Arestis and Carolina Troncoso Baltar 2017; Tridico 2017; Kosta Josifidis and Novica Supić 2018; Furceri and Ostry 2019; Marzia Ippolito and Lorenzo Cicatiello 2019; Nolan and Valenzuela 2019). Moreover, some authors argue that the interaction between financialization and rising inequality (in the form of a declining share of labour income in GDP and a rising inequality in the personal income distribution), by contributing to higher economic and financial instability, has provided the conditions for the burst of the Global Financial Crisis and the subsequent Great Recession (Engelbert Stockhammer 2013; Tridico 2017, Forthcoming).

The existing literature on the factors driving inequality upwards, regardless it is related to the rising polarization in personal income distribution or to the changes in functional distribution in favour of profits and capital incomes, shares the argument that there is not a single cause of the higher inequality. Income inequality would be explained by a combination of different, but interrelated elements, operating all of them in the same direction (Tail 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; and profit-led and export-led growth). Also 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; Tridico 2018; Juan-Francisco Albert, Nuria Gómez-Fernández, and Carlos Ochando 2019; Elena Bárcena-Martín, Natalia Martín-Fuentes, and Salvador Pérez-Moreno 2019; Ennis, Gonzaga, and Pike 2019; Furceri and Ostry 2019; Nolan, Richiardi, and Valenzuela 2019; Nolan and Valenzuela 2019; Natalija Novta and Evgenia Pugacheva 2019).

## 2. Labour Flexibility and Income Inequality

Since the decade of the eighties, many developed and emerging economies have approved labour market reforms with the objectives to accelerate the processes of employment creation and to reduce the high rates of unemployment. These reforms were based on the hypothesis that rigid labour markets generated negative labour markets results. Therefore, a significant number of reforms were passed, which acted on what was presumed to be the main sources of rigidities and inefficiencies in the labour market. Namely, the unemployment protection schemes, the collective bargaining or the employment protection legislation (Jesús Ferreiro and Carmen Gómez 2017; Tridico

and Ricardo Pariboni 2017; Emiliano Brancaccio, Nadia Garbellini, and Rafaele Giammetti 2018; Adriana D. Kugler 2019; Stephen McBride and James Watson 2019).

Despite the spreading and intensity of these reforms, however, the empirical evidence is not conclusive. Recent empirical studies have not demonstrated that high unemployment rates are due to existing labour market institutions, which are responsible for high unemployment. Whether a higher flexibility of these institutions contributes to reducing unemployment, or which are the institutions that have a positive or negative impact on labour market<sup>4</sup> (Sabina Avdagic and Paolo Salardi 2013; Giuseppe Bertola 2017; Ferreira and Gómez 2019; Kugler 2019).

Many of these reforms have focused on the employment protection legislation (EPL), that is, the legal constraints that affects the capacity of employers to hire or fire workers and to hire workers using the different types of employment contracts. Since the eighties, many countries have approved labour reforms 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 contract (in comparison with those for permanent contracts), thereby giving rise to a segmented labour market with a rising share of atypical employment contracts.

Despite the generalization of these reforms, however, there is not an unambiguous empirical evidence supporting the effectiveness of these measures to increase employment and reduce high unemployment rates (Organisation for Economic Cooperation and Development - OECD 2018). 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 (Avdagic and Salardi 2013; Stockhammer, Alexander Guschanski, and Karsten Köhler 2014; Avdagic 2015; Tito Boeri, Pierre Cahuc, and André Zylberberg 2015; Peter Gal and Adam Theising 2015; Bertola 2017; Ferreira and Gómez 2019; Kugler 2019; Arestis, Ferreira, and Gómez 2020).

It must be emphasized that 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, we can find a rising number of studies that conclude that the reforms in the labour market that have tried to make it more flexible have had micro and macroeconomic negative consequences; like a higher labour segmentation, a deterioration in the job quality, an unsustainable increase in the household

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<sup>4</sup> It must be emphasized that, since late nineties, non-mainstream economists claimed that labour market deregulation did not have a positive impact on labour market reforms (see, for instance, Robert Buchele and Jens Christiansen 1998; Dean Baker et al. 2005).

consumption and borrowing. A more inegalitarian personal income distribution, the generation of disincentives to innovation and physical and human capital accumulation, a negative impact on productivity growth, higher poverty rates, etc. (Alfred Klein-knecht 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).

Focusing on the impact on labour market reforms on income distribution and inequality, a growing number of studies have focused on the effects generated on income inequality by the reforms to employment protection legislation approved since the decade of the eighties that have facilitated the conditions for hiring and firing temporary and permanent workers. In this sense, there is a general consensus in the sense 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).

### 3. Empirical Model

The main object of our paper is to analyse the determinants of the evolution of the labour income share. Specifically, we will analyse the determinants of the change in the labour income share, focusing on the impact coming from the employment protection legislation.

To analyse the change in the size of labour income, that is, the changes in the functional income distribution, we use as explained variable the compensation of employees as a percentage of GDP. This variable will be calculated using the data on GDP and compensation of employees from the Annual National Account series made by Eurostat (2020)<sup>5</sup>.

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 done 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.

The objective of our paper 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 recoded decline in the labour income share in Europe.

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<sup>5</sup> Eurostat. 2020. Annual National Accounts. <https://ec.europa.eu/eurostat/web/national-accounts/data/database> (accessed January 10, 2020).

To estimate the effects of the protection of permanent and temporary workers, we use 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); (iii) additional, specific requirements for collective dismissals. Each indicator is measured on a 0 to 6 score, where higher values represent a stricter regulation.

These indexes have several advantages. First, given that the methodology employed in the elaboration of the indexes is the same for all countries, they allow making a comparison of the strictness in the employment protection legislation among countries. In this sense, the countries with the highest scores (the stricter provisions on individual and collective dismissals) would be those with the most rigid labour markets, 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 for regular-permanent workers against individual and collective dismissals, while the other measures the regulation of temporary forms of employment (fixed-term contracts and temporary work agency employment). The first index is in turn split into two indexes: one related to the protection of permanent workers against individual dismissal, and the other related to the specific additional requirements for collective dismissals of permanent workers. Thus, 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 the versions 1 of the 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, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom). The analysed period cover 18 years, namely 1996 to 2013 (18 years). Therefore, we have 360 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, European Commission 2020). Data on employment growth and unemployment rate have been obtained from the International Labour Organization (2020)<sup>6</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 from 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 percentage 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.

Therefore, the model we test is:

$$\Delta \text{Compensation of employees}_{i,t} = \beta_0 + \beta_1 \Delta X_{i,t} + \beta_2 \text{EPR}_{i,t} + \beta_3 \text{EPR}_{i,t}^2 + \beta_4 \text{EPT}_{i,t} + \beta_5 \text{EPT}_{i,t}^2 + \beta_6 \Delta \text{Real wages}_{i,t} + \beta_7 \text{Trade balance}_{i,t} + \beta_8 \text{Trade openness}_{i,t} + \epsilon_{i,t},$$

where  $\Delta X_{it}$  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.

Table 2 shows the main descriptive statistics of the variables included in our model. Regarding the dependent variable, we must highlight the negative sign of the mean and the median of the growth of the compensations of employees. This negative sign shows the existence of a declining size of labour income share in the analysed economies. This decline takes place in a context of economic growth, increase of employment and rising real wages. The economic context in terms of the unemployment rate is not so clear, given the difference in the mean and median values of the growth of unemployment rate, a proof of the clear differences among countries about the evolution of unemployment.

<sup>6</sup> **International Labour Organization.** 2020. Statistics and Databases. <https://www.ilo.org/global/statistics-and-databases/lang--en/index.htm> (accessed January 10, 2020).

**Table 2** Descriptive Statistics of Explained and Explanatory Variables

	Mean	Median	Maximum	Minimum	Std. dev.
Growth of compensation of employees	-0.001	-0.058	4.369	-5.356	0.971
GDP growth rate	2.150	2.328	1.090	-9.133	2.796
Employment growth	0.695	0.719	8.205	-8.657	2.037
Real wages growth	1.369	1.093	1.141	-9.137	2.309
Unemployment rate growth	0.048	-0.064	6.602	-4.239	1.311
EPR index	2.383	2.341	4.583	1.095	0.671
EPT index	1.763	1.406	4.750	0.250	1.085
Trade balance	1.888	2.350	18.800	-12.600	5.843
Trade openness	89.631	79.750	191.500	37.500	36.790

Source: Own construction.

The decline in the size of labour incomes in this environment 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 affects the share of labour incomes.

A possible problem affecting our model would be the existence of high correlation between the explanatory variables, which could give rise to a problem of multicollinearity. Table 3 shows the matrix of correlations between the explained and explanatory variables included in our analysis. Data of Table 3 shows a high correlation between the employment rate of growth and the growth of unemployment rates. This result implies that we cannot include as explanatory variables in the same equation the growth of employment and the growth of unemployment rates. For this reason, we will test five equations. The first three equation will test separately the impact of the GDP growth, the employment growth and the growth of unemployment rate. The fourth equation will test the joint impact of GDP growth and economic growth, and the fifth equation will test the joint impact of GDP growth and growth of unemployment rate.

**Table 3** Matrix of Correlations

	Growth of compensation of employees	Employment growth	Real wages growth	Unemployment rate growth	Trade balance	EPR	EPT	GDP growth rate	Trade openness
Growth of compensation of employees	1.000								
Employment growth	0.059	1.000							
Real wages growth	0.526	0.050	1.000						
Unemployment rate growth	-0.0423	-0.828	-0.094	1.000					
Trade balance	-0.102	0.132	-0.181	-0.062	1.000				
EPR	-0.000	-0.107	-0.014	0.041	-0.428	1.000			
EPT	0.041	0.024	-0.138	0.009	-0.332	0.324	1.000		
GDP growth rate	-0.257	0.655	0.370	-0.642	0.002	-0.084	-0.093	1.000	
Trade openness	-0.061	0.085	0.072	-0.045	0.457	-0.286	-0.442	0.134	1.000

Source: Own construction.

## 4. Empirical Investigation

Our estimations use a panel data model with cross-section and period fixed effects<sup>7</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>8</sup>. Therefore, we apply SUR estimators to correct the contemporaneous correlation between cross-sections.

**Table 4** Determinants of the Growth of Compensations of Employees

	(1)	(2)	(3)	(4)	(5)
Constant	-1.579 (0.806)	2.714 (1.797)	2.536 (1.795)	0.160 (1.306)	0.287 (1.487)
GDP growth	-0.124*** (0.026)			-0.314*** (0.024)	-0.260*** (0.027)
Employment growth		0.113*** (0.021)		0.298*** (0.023)	
Unemployment rate growth			-0.149*** (0.034)		-0.358*** (0.039)
EPR	0.041 (0.836)	-1.924* (1.020)	-1.849* (1.023)	-0.344 (0.717)	-0.484 (0.823)
EPR <sup>2</sup>	0.020 (0.110)	0.233* (0.133)	0.241* (0.133)	0.040 (0.097)	0.096 (0.107)
EPT	0.528** (0.267)	0.765*** (0.254)	0.780*** (0.249)	0.331* (0.185)	0.444*** (0.167)
EPT <sup>2</sup>	-0.072* (0.041)	-0.126*** (0.042)	-0.123*** (0.042)	-0.053* (0.030)	-0.057** (0.029)
Trade openness	0.007 (0.005)	-0.009 (0.005)	-0.009 (0.006)	0.000 (0.003)	-0.001 (0.004)
Trade balance	-0.034* (0.020)	-0.018 (0.018)	-0.020 (0.019)	-0.014 (0.013)	-0.020 (0.015)
Real wages growth	0.321*** (0.019)	0.298*** (0.019)	0.294*** (0.019)	0.369*** (0.014)	0.348*** (0.017)
R <sup>2</sup>	0.680	0.677	0.669	0.815	0.774

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

**Source:** Own construction.

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 labour income share. This is a robust result, which is not affected by the changes in the explanatory variables included in the equations.

As far as the evolution of employment and unemployment rates, it has a cyclical component, which implies that economic fluctuations have an impact on the evolution of labour share. Labour share will rise during booms, when employment rises and unemployment rates decline, and it declines during recessions, when employment declines and unemployment rises.

<sup>7</sup> Redundant fixed effects test confirm the existence of cross-section and period fixed effects. Lagrange multiplier tests did not detect the existence of cross-section random effects. Finally, Hausman tests confirm the validity of the implementation of a fixed-effects model. Data available upon request.

<sup>8</sup> Data available upon request.

It is important to notice that data for employment and unemployment come from the EU Labour Force Survey. For this source, employed persons are those persons aged 15 years and more who declare that are in one of the following categories: (a) persons who during the reference week worked for at least one hour for pay or profit or family gain; or (b) persons who were not at work during the reference week but had a job or business from which they were temporarily absent. This implies that employed people can work in formal or in informal economy. As far as wages are different in formal and informal labour markets, this implies that a change in the size of informal labour markets may affect income distribution. A rising share of informal employment would lead to a decline in labour income, and *vice versa*. This is a relevant issue, mainly for those economies with a high share of informal economy. In this case, changes in the share of informal employment may be a key driving force of the changes in income distribution<sup>9</sup>.

Economic growth is a significant determinant of the evolution of the size of compensation of employees having a negative impact. We must emphasize that this is a robust result, which happens in all the equations estimated. The negative sign of the coefficient has a double implication. From a short-term perspective, it implies that the business cycle has an impact on the size of labour income share: the labour share declines during expansions, when the rate of growth of GDP is positive, but it increases during recessions, when the real GDP falls.

An explanation for this result is related to the low volatility of employment and wages in relation to that of the GDP. The high persistence of these variables, and, consequently, of labour income, makes it that the impact of economic fluctuations on capital income be higher. In other words, the volatility of capital income is higher than that of labour income. During a recession, the decline in capital income is larger than that of labour income; therefore, during a recession the labour share rises. On the contrary, during an expansion the increase in capital income is larger than that of labour income; therefore, during an expansion the labour share declines<sup>10</sup>.

However, it must be noted that, as Table 2 shows, the mean of the rate of growth of real GDP is positive, above 2%. This implies that, from a long-term perspective, the current model of economic growth in European countries operates against labour income. This model, based on a more intense use of capital and a rising importance of finance in the allocation of resources by private agents (financialization process), would lead to a rising share of capital income and profits in the European economies, implying a structural change in these economies that contributed to the decline in the labour income share.

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 also a robust result, which is not affected by the different specifications of the models.

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<sup>9</sup> We thank one referee for the mention to this relevant point. In any case, the analysis of the role played by informal labour markets on the evolution of income distribution is outside the scope of this paper.

<sup>10</sup> The values of the period fixed effects corroborates this hypothesis. The period fixed effects record a very high positive values for the years 2008 and 2009, in the beginning of the recession, and in 2012, when the mean GDP growth rate was negative.

Trade openness does not have a significant effect on the size of compensation of employees. 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 European countries.

Nonetheless, this result does not exclude the possibility that such a negative impact has happened in some countries, mainly in those countries that have recorded the highest and fastest increases in trade flows. Furthermore, this result is not incompatible with the existence of a redistributive effect in terms of the personal income distribution. As far as globalization has damaged low-skilled and low-wage jobs, benefitting high-skilled and high-wages jobs and workers, total labour share may have remained unchanged, but at the expense of a rising income polarization.

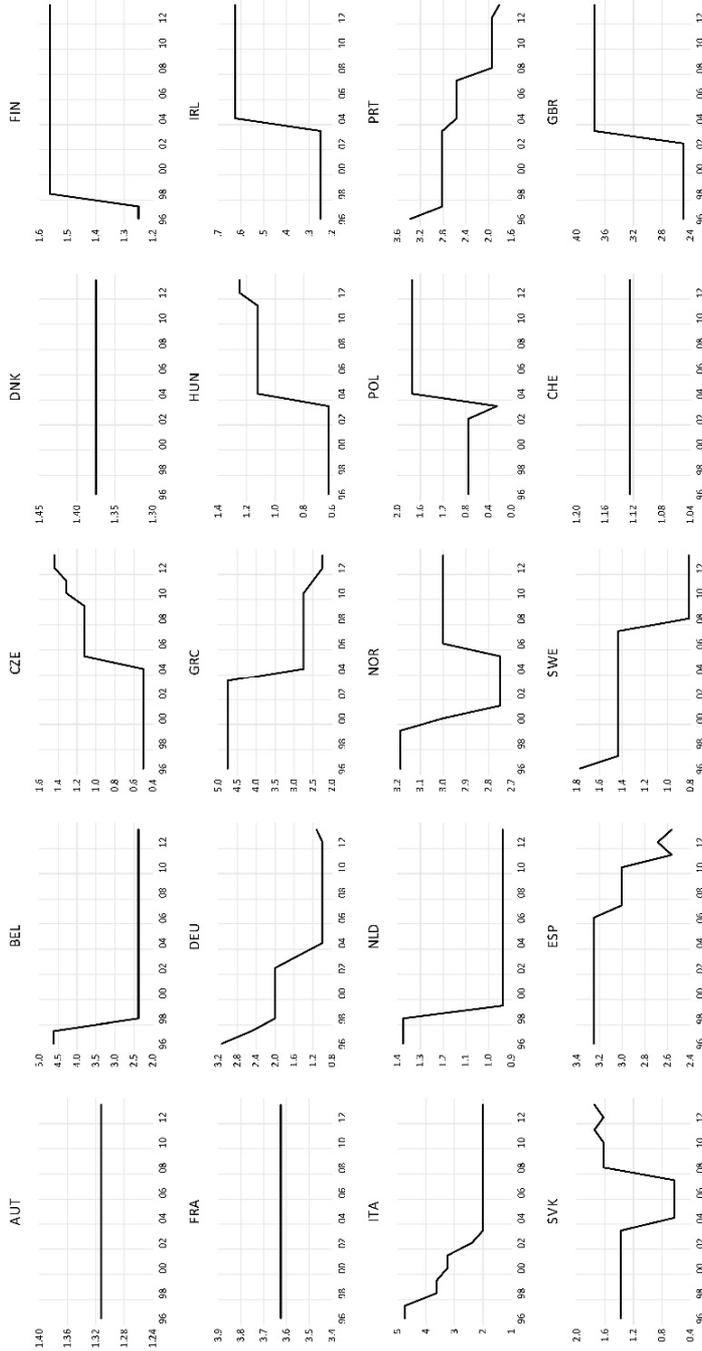
Results are similar for trade balance. This variable has a significant impact when GDP growth is the only macroeconomic variable included in the model. The sign of the coefficient is negative, implying that a trade balance surplus leads to a decline of labour share. A possible explanation to this result is that the improvements in competitiveness leading to a decline in trade deficit or a higher trade surplus may be associated with wage deflations, with the consequent negative impact on labour share.

However, this significant effect vanishes in the other equations. Indeed, the impact also disappears when, besides GDP growth, we include as explanatory variable the growth of employment or the growth of unemployment rate. Nonetheless, as in the case of the trade openness, this result does not imply that trade balance cannot affect the personal income distribution.

Regarding the impact on labour income shares of employment protection, Equations (2) and (3) (Table 4) show the existence of a quadratic relation between employment protection for permanent workers and the growth of the compensation of employees. This non-linear relation is negative and rising. Nonetheless, given that the value of the EPR index ranges from 0 to 6, employment protection for permanent employees has a negative impact on labour share.

However, this result is not robust. When the estimations include the GDP growth as explanatory variables (Equations (1), (4) and (5), as in Table 4), the impact is no longer significant. Therefore, we can conclude that employment protection for permanent employees is not a significant determinant of the changes in the labour income share.

The results are different for the constraints to 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. The EPT index has a decreasing marginal effect: above a threshold, which, depending on the equations, oscillates between 3.03 and 3.89, the positive effect on labour shares is fewer and fewer. Nonetheless, given that the EPT index ranges from 0 to 6, employment protection always has a positive impact on the labour income share. This is a robust result that happens in all the equations.



Source: Own construction.

Figure 1 EPT Index

To evaluate the consequences of this result, we must notice that a high number of the European countries have relaxed the constraints to the use of temporary workers. Figure 1 shows the evolution of the EPT index in the sample of countries-years included in our study. In four countries (Austria, Denmark, France, and Switzerland), the EPT index has remained unchanged. In seven countries (Czech Republic, Finland, Hungary, Ireland, Poland, Slovakia, and the United Kingdom) the EPT has increased. We must highlight that all countries where EPT index has increased, recorded EPT indexes below the mean and the threshold value above which the EPT index has a marginal decreasing impact.

In the remaining nine countries (Belgium, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, and Sweden), the EPT index has declined. In these cases, the reforms in the employment protection legislation that has made the use of fixed-term and temporary work agency contracts more flexible have led EPT indexes below the above-mentioned threshold. This implies that these reforms have reduced the positive impact of employment protection for temporary workers on the size of compensation of employees. In other words, the reforms promoting the use of temporary workers have had a negative impact on the evolution of labour income share.

## 5. Summary and Conclusions

Developed economies, European ones among them, have been characterized in the last decades by rising income inequality, both in terms of personal income distribution, with a remarkable increase of the income of the richest individuals, and of functional distribution, with a sustained decline of labour income share.

Our paper has analyzed the determinants of the change of labour income in set of twenty European countries over the years 1996 to 2013. We have focused on the possible impact of employment protection on the dynamics of the size of compensation of employees, measured as percentage of GDP.

Our results show that economic growth, employment growth, growth of unemployment rates, and growth of real wages, are significant determinants of the evolution of labour income shares in the European countries. On the contrary, the trade balance and the trade openness do not explain the changes in labour share. These results imply that to increase the size of labour incomes, European economies must implement measures to accelerate the growth of employment and to reduce the high unemployment rates. Moreover, these measures must come in parallel with a higher growth of real wages.

Regarding the effects of the employment protection legislation, employment protection for permanent workers does not have a significant impact on the evolution of labour share. This is not the case of employment protection for temporary workers, which has a significant positive effect on the growth of labour share. This result implies that the reforms passed in many European labour markets, promoting the use of fixed-term and temporary work agency contracts, had a negative impact on the labour income share.

Our results, therefore, reinforce the contributions that claim for new labour market reforms, which increase employment protection for workers, mainly for temporary workers, and reduce the current excessive labour segmentation and the excessive rate of temporary workers, which has led to adverse micro and macroeconomic consequences, among them, an inegalitarian income distribution.

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