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Abstract

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Liberalisation of temporary contracts has become an important component of recent labour reforms but up to now available research has not paid attention to the impacts of these institutional changes on functional income distribution. The present paper intends to fill this gap by focussing on the reduction in strictness of employment protection of temporary jobs and analysing its effects on factor shares.

We have estimated labour share, as well as its components, worker pays and employment, by considering country-sector evidence for 14 EU economies and the sample period 1995-2007. We have found that these legislative changes, that have favoured the extensive use of temporary contracts, have contributed to instability of working conditions and caused negative effects on workers' pays. These impacts have more than counterbalanced the scanty positive effects on employment (due to greater access to the labour market of additional workers, likely young and women), thus leading to a decrease in income share accruing to workers.

Keywords: factor income distribution, labour regulation

JEL Classifications: E25; J50.

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1. Motivation[1]

The slowdown of the labour share recorded in industrial countries from the early 1980s up to the present has spurred a resurgence of interest in the functional distribution of income and has led many economists to reconsider the role of several factors such as globalization, the *ICT* revolution, product and labour market institutions. However theoretical models and empirical analyses have been less careful to explain the role of important deregulations represented by transition from regular toward unstable and precarious jobs in many European economies.

Indeed, substantial liberalisations of labour markets have been recorded since he mid 1990s, following the key recommendations of the 1994 OECD Jobs Strategy, in particular in terms of new regulatory frameworks to liberalise the utilisation of temporary contracts. As a result, extensive use of temporary contacts has been one distinctive characteristic of European labour markets, and "today nearly 14% of of EU employees work on contracts of limited duration." (Salvatori, 2012, p. 944) What is still unexplored, however, is how these reforms, leading to enduring skill deficits and job instability, have influenced the functional distribution of income, thus failing to contrast the declined trends in labour share recorded in previous decades. The major motivation of the present paper is filling this gap.

Notice also that the empirical work on the functional distribution of income "is rather meagre" (Azmat, Mannning and Van Reenen (2012, p. 1) and the few available studies are based on aggregate data. The limitation of these works is that the effects of labour policies, defined at the aggregate level, may be obscured by confounding factors that influence cross-country variations. The present paper intends to circumvent these additional limitations by understanding changes at *country-sectoral* level. Indeed, by applying a shift and share analysis we ascertain whether the declining trends of labour shares (*LS*) are due to genuine wage moderation tendencies *within* sectors or simply to the relative decline in high wage share sectors, and the parallel growing importance of low wage sectors, i.e. to a 'compositional bias'. (De Serres et al. 2001)

Our observation period starts from the mid nineties when significant intra-Europe cross-country diversities arise, as shown by a number of studies (among others van Ark, et. al. 2008) and we take a closer look at the EU economies to *distributive* matters. We also use a difference-in-difference approach and estimate the influence of country institutional variables by controlling for industry effects. This estimation strategy allows us to verify whether changes in labour legislation of temporary contracts have caused significant effects on *LS,* especially in those sectors where the propensity to use temporary contracts is higher. In addition, we analyse the channels through which *LS* changes occur with separate estimates of employment and wages movements, the two components of *LS*.

[1]The authors thank, for their helpful comments, the discussant and participants in the 12th Bi-annual Conference of the European Association for Comparative Economic Studies – EACES, Glasgow, 6-7 September 2012.

The results of our research show the significant negative role of liberalisation for temporary workers that have played an autonomous influence, additional to compositional bias. We provide further support for a thorough evaluation of policy interventions in a phase in which in many European countries new measures for growth and job creation are called for (European Commission, 2011). In addition, we can plausibly deduce from our results that welfare enhancing policy packages that contrast precarious work arrangements may contribute to break the declining trends of labour share. This is particularly relevant for a 'wage-led demand regime', typically represented by the Euro area, as noticeably shown by the post Kaleckian model of Stockhammer et al. (2009)[2]. For this area, functional income distribution adverse to labour has substantial negative effects on aggregate demand. Thus, policy reforms that contrast precariousness of working conditions, far from being productivity-depressing (Damiani, Pompei and Ricci 2011), may be managed to sustain demand and growth simultaneously.

The paper is organised as follows. Section 2 briefly reviews the related literature on functional income distribution. Section 3 discusses the conceptual framework behind our empirical strategy. Section 4 presents data and sources and offers some descriptive statistics and estimates. Section 5 concludes.

2. Related literature

The functional distribution of income is a central issue for classical economists and as Ricardo assessed "to determine the laws which regulate this distribution is the principal problem in Political Economy" (Ricardo, 1911 [1817], p. 1 in 1911 edition).

However, the evolution of factor shares has been considered as being characterised by the constancy of factor share and generations of economists shared a motivated increasing disinterest in functional distributive matters, and "at least since the 1960s, factor shares have been downplayed" (Atkinson, 2009, p.4). The rationalisation given by the growth economic theory was that real wage and productivity increase at the same rate, while the sum of employment and productivity growth determines the growth of output. Under these conditions, the stability of the labour share was easily obtained and depicted as one of the main regularities of growth (Kaldor, 1961).

In a different perspective, neoclassical economists offered their basic model based on the Cobb Douglas production function (characterised by a unitary elasticity of substitution between capital and labour) and showed that the additional assumption of competitive markets was sufficient to deliver the constancy of factor shares, regardless of changes in the capital-labour ratio and technological progress (see, among others, the contribution of Barro and Sala-i-Martin, 1995).

However, as time progressed, a considerable variation of factor shares motivated a revival of interest in distributional issues. Since, the end of seventies, a marked decline

[2] See also the contribution of Charpe and Kühn (2012) who show in a DSGE model that a fall in workers bargaining power and adverse affects to labour income lead to lower aggregate demand, lower employment and output.

characterised the average share of labour of 14 European OECD countries and Japan, and as Glyn pointed out in a chapter of The Oxford Handbook of Income Inequality (2009), "after rising steeply in preceding years, the series peaks in 1976 and then falls almost continuously up to present." (Glyn, 2009, p. 113)

The interest in causes of the fall of labour share have encouraged several theoretical contributions but up to now the majority of empirical literature on changes in inequalities addresses personal distribution of income, even if "functional share research is just beginning a new resurgence" (Salverda, Nolan and Smeeding, 2009b).[3] However, redistribution from profits to wages has a significant role in raising personal income inequalities, as found for an ample sample of developed and developing countries by Daudey and García-Peñalosa (2007)[4], and these kinds of 'junctures' (between personal and functional distribution) appear 'promising avenues of research' (Atkinson, 2009, p. 15).

Recent empirical papers have renewed interest in factor shares (Bentolila and Saint Paul, 2003; Gollin, 2002; De Serres et al. 2001) and such international organizations as IMF (Guscina, 2006, IMF, 2007, chapter 5, Jaumotte and Tytell, 2007), the European Commission (2008, ch. 5; Arpaia et al. 2009) and the Bank of International Settlements (Ellis and Smith, 2007) have tried to identify the main factors behind movements in the labour share. Two main driving forces have been signalled as being globalisation and technological changes, and a common factor behind these forces: deterioration of labour power.

Certainly, openness to trade, consistent with the prediction of the Heckscher-Ohlin model, has led capital- rich countries to specialise in the production of capital intensive goods, thus causing a decline in labour shares, as shown by Guscina for a sample of 18 countries over the period 1960-2000. These shifts have been amplified by capital mobility which has decreased the bargaining power of labour, the less mobile factor, and thereby its share of national output (Jayadev, 2007). Additional channels of globalization of labour represented by off shoring and immigration have exerted downward pressures on European labour shares (IMF, 2007), whereas larger FDI flows and the degree of capital account openness have contributed to the erosion of these shares (Harrison, 2002). However, this field of research offers explanations that reveal insufficient. For instance, it has been found that a percentage point increase in the trade-to-GDP ratio determines a fall of compensation and employment share by only 0.14 and 0.17 percentage points, respectively (Guscina, 2006). In addition, the evolution of labour share observed in various industries also involves non traded sectors, but for these sectors the declining trends cannot easily be explained by globalisation. Other institutional variables appear behind these movements, for instance privatisation processes, the main driving force behind shifts in network industries (Azmat, Manning and Van Reenen, 2012).

[3] The authors are the editors of mentioned Oxford Handbook of Income Inequality, mentioned above.

[4] Daudey and García-Peñalosa examine 39 countries and prove on the basis of cross-country and panel evidence that smaller labour share are associated to greater inequality, thus obtaining that the factor distribution of income is an essential determinant of the personal distribution of income.

The neoclassical theory of distribution has been, in any case, the dominant approach but technological factors alone cannot reproduce the labour share movements of European economies. Indeed, in dominant neoclassical models relative factor prices are dependent on factor proportions (the capital/labour ratio) and characteristics of the production function. However, even relaxing the condition of a unitary elasticity of substitution between factors (which predicts unrealistic stable factors shares) it is difficult to explain actual declining changes observed over time. This is clearly shown by Blanchard (2000) who simulated (for Continental Europe and fifteen years) two different cases, featuring an elasticity of substitution between factors lower and higher than one, and for each case he found that only a limited fraction of labour shares might be explained by technological determinants (no more than 40%)[5].

Additional determinants of factor shares may be represented by striking technological changes that have affected *IT*- related goods, improved the quality of monitoring worker effort (Bental and Demougin, 2010) and reduced the (endogenous) bargaining power of labour[6]. With respect to neo-classical interpretations, these studies focus on the interactions between changes in labour market institutions and technology. This is the main perspective of Caballero and Hammour (1998), who intend to explain European capital-labour relations during the last three decades. The authors present a model featuring in the short run a putty-clay technology and quasi fixed capital which give workers strong bargaining power and allow them an appropriation of firm specific rents; in the long run, on the contrary, the supply of capital is much more elastic and it permits a substitution away from labour to thwart appropriation from workers. However, as pointed out by Giammarioli et al. (2002, p.13) "The are two problems with this approach. Firstly, the authors do not consider at all the fundamental role of the deep reforms in labour market institutions that occurred in most of the European countries in the 1980s… Secondly, their argument is based on the existence of a high long-run elasticity of substitution between capital and labour, which seems in contrast to most of the available empirical evidence."

Other studies have found that new technologies tend to complement high-skilled workers, but substitute low-skilled types, as estimated by Arpaia et al. (2009) and by the European Commission (2008) and these substitution effects "are at the heart of a clear understanding of the direction in which a change in an economic variable affects the labour income share." (European Commission, 2008, p.260)

However, labor-augmenting technical progress and capital-high skill complementarity have to be considered with other sources of variation of the labour share which may account

[5] Another criticism has been arisen by Rowthorn (1999), who has estimated that the more realistic value of the elasticity of substitution is lower than one, thus requiring a decrease of the capital-ratio to explain the falling trend of the labour share occurred from the mid-1980s. However this decrease has never been confirmed by actual data, at least for European economies (see also EU Commission, 2007).

[6] Hornstein, Krusell and Violante (2007) propose a' technology-policy interaction' and show that "in the context of a labor market with frictions, a capital-embodied technological acceleration may reduce firms' incentives to create new jobs, increase unemployment and reduce the labour share". (p. 1089)

for the existence of a wedge between the real wage and the marginal product of labor, as shown in some other influential studies (Blanchard, 1997; 1998; Bentolila and Saint Paul, 2003). These authors prove that under (very restrictive) competitive conditions and a production function with constant returns to scale, "movements in the labor share can be fruitfully decomposed into movements along a technology-determined curve, namely the share capital (SK) curve" (Bentolila and Saint Paul, 2003, p. 25). However, they admit that the predictive power of this relation is rather limited, since in more general conditions, i.e. in environments featuring product and labour market imperfections, equilibrium values of the labour share may move anti-cyclically[7] and lie outside the *SK* schedule, as confirmed by their estimates. In this perspective, not only regulation of markets that influence changes in mark-ups, but also union bargaining power and adjustment costs play a central role on functional distribution of income. In sum, the importance of labour institutions, in economies where persistent deviations from 'ideal' competitive conditions are pervasive, may be not keep out from the picture even in neoclassical models. However this kind of contributions shares the common view that only far-reaching labour deregulation may contrast bad employment performances and unfavourable conditions for labour income distribution. As we will see below, our evidence is less clear-cut.

3. The conceptual framework of empirical analysis

The main institutional determinants of labour share (*LS*) may be introduced into a reduced-form equation that is consistent with the by now standard price/ wage-setting of Layard *et al.* (1991). In this model, characterised by non competitive product and labour markets, institutions influence wages and employment levels, thus becoming a significant determinant of the functional distribution of income.

In this price/wage-setting, where firms choose their price strategy and where workers bargain over their wage rates, there is not a direct one-for-one relationship between the share of value added accruing to labour and the capital-output ratio. Indeed, a mark-up of price over marginal cost is charged by each firm, usually conditioned by regulations that limit product market competition. In terms of remunerations, the bargaining power of unions led to a wedge between the negotiated wage and the reservation value. In this context, wages and employment (the two components of the numerator of the labour share) are the outcome of maximizing behaviour of non competitive firms and of unionized workforce (Blanchard and Giavazzi, 2003).

[7]Bentolila and Saint Paul (2003) assume constant returns to scale and labour embodied technical progress; in their model the production function is $Y=F(BL, K)$, that can rewritten as $Y=Kf(BL/K)=Kf(l)$ where $l=BL/K$. Under imperfect competition, there is a mark-up μ on marginal costs (given by the real wage rate w). Then the first order condition for profit maximization equates gives: $Bf'(l)=\mu w$ and one obtains the labour share $LS=[l f'(l)(l)]/\mu$, where the term in square brackets is the elasticity of labour demand to the real wage η; hence the labour share simplifies as $LS= \eta/ \mu$. Pro-cyclical variations of mark-up cause anti-cyclical shifts of labour shares. In addition, under *EPL*, *LS* may move counter-cyclically, as shown in Kessing (2003), Bentolila and Saint Paul (2003), Bentolila and Bertola, (1990).

The underlying suggestion of this approach is that three main factors may influence factor shares: i) employment protection that causes adjustment costs (and a wedge between the marginal revenue product of labour and the wage rate); ii) unionisation and collective labour relations that affect wage setting in the labour market; iii) changes in mark-ups and in product market regulation that influence rents in the goods market.

Employment protection of labour

The evolution of labour shares may be conditioned by employment protection of labour (*EPL*), i.e. to norms for permanent contracts (*EPLR*) and for temporary contracts (*EPLT*) [8]. Let us start by considering the expected results associated with changes in protection of temporary workers (*EPLT*), which is the main focus of our analysis.

It is likely that low protection of temporary positions causes coordination and opportunity costs, as implicitly suggested by the vast new literature on personnel economics, aimed at exploring the "black box" of Human Resource (*HR*) practices and their functioning inside the firm (Michie and Sheehan, 2003, 2005). This literature emphasises that good practices include, among others, "employment security policies and labor-management communication procedures", as pointed out in the rich overview provided by Ichniowsky and Shaw (2003, p. 156). In particular, the 'opportunity cost' of temporary contracts is greater during intense periods of technological and organizational changes. Indeed, as found by Bresnahan, Brynjolfsson, and Hitt (2002), there is evidence that "IT are complementary to broader job responsibilities for line workers, more decentralised decision making, and more self-managing teams."(p.339) Thus, the adoption of informational technologies (*IT*) and decentralized (holistic) forms of workplace organization (including self-managed teams, multi-tasking and delegation of decision rights) largely contributes to give increasing importance to human capital motivation and cooperative behaviour. Notice also that the need of continuous skill upgrading, cooperation and commitment requires, on its turn, training investment, job stability and best practices of management that are typically negatively correlated with the use of fixed term contracts. This is a promising avenue of research whose relevance to explain functional distribution of income is still unexplored. From this field, it is predictable that HR inferior strategies narrowly oriented only to cost minimisation in the short-term and to higher degree of functional flexibility, through opening of precarious positions, are conducive to high opportunity and coordination costs, low rewards and, thorough these channels, low *LS*[9]. This is an important rationalisation of positive adjustment costs, that cause a wedge between real wage and marginal product of labour.

[8] For the role of other institutions, such as active labour market policies, unemployment benefits, minimum wages, labour tax wedges, out of the scope of the present paper, see the European Commission (2008).

[9] The reasons behind the adoption of these inferior practices may be due, as found by Bloom and Van Reenen (2007) to low competition that allows poor practices to persist and to the absence of a proper selection of management, especially in case of family firms. An additional explanation is that offered by new studies on behavioural economics that focus on myopic choices and short-termism (Laverty, 1996).

For remuneration, strong negative effects caused by lower *EPLT* are conceivable. Indeed, employment protection of temporary workers affects human capital accumulation and productivity and the bargained wage. Especially in environments where training cannot be contracted between firms and workers because of the unverifiable and unenforceable nature of firm-specific human capital investments, low *EPLT* disincentivate employees to invest in firm-specific human capital by decreasing the probability of the survival of the matching of employees and employers (Arulampalam, Booth and Bryan, 2004). This result is relevant in all contexts where risk-averse employees are liquidity-constrained and cannot obtain insurance against dismissals (Belot, Boone and van Ours, 2007). It means that workers with low protection, as those occupied with fixed terms contracts, receive less training and are less well-paid (Bassanini et al., 2007); and these temporary occupations, as found by Booth, Francesconi and Frank (2002) for the UK, rather than be 'stepping stones' to permanent employment in good jobs, reveal to be 'dead end' jobs, characterised by poor pay and poor prospects. One related implication is that "the expected wage should persist through the individuals' careers." (Booth, Francesconi and Frank, 2002, p. F189 and 192)

The effect of *EPLT* on employment outcomes, are expected to be ambiguous. On one hand, it may be advocated the implicit trade-off caused by liberalisation of temporary contracts between efficiency (negative) growth and employment (positive) growth; indeed fixed term contracts may have caused the European process of shifting toward higher employment levels, even if accompanied by lower average productivity increases (Dew-Becker and Gordon, 2008). On the other hand, it can be argued, following Blanchard and Landier (2002), that deregulation of temporary contracts may merely increase the turnover in the labour market, rather than being "stepping stones" to permanent jobs, since this last type of job remains costly to dissolve due to the presence of high restrictions on dismissals. The main effect of labour reforms at 'the margin' is higher, not lower, unemployment.

To summarise, in terms of final outcomes, in case of lower *EPLT* we expect stronger negative effects on wages (that are conducive to a reduction in labour share) and uncertain effects on employment.

Our estimates also control for norms that protect regular workers. It has been formalised that *EPLR* protects jobs at times of declining demand but because employers refrain from firing in downturns they also refrain from hirings in upturns, and hence the overall effect on employment is ambiguous, as theoretically shown by Bertola (2009).

Furthermore, it is noteworthy that also expected effects on wages are uncertain. As shown by the 'insider-outsider' literature, *EPLR* afforded to currently employed workers enhances their bargaining power and entails more favourable wage negotiations (Bertola, 1999). However, an alternative interpretation, consistent with the 'implicit contract theory', such as the model proposed by Gomme and Greenwood (1995), is that *EPLR* provides job security and a sort of insurance contract between workers and firms, where the insurance premium, against the risk of dismissals, is paid in terms of lower pays. This is an interpretation not too distant from actual experiences of European economies where recent years have seen considerable wage restraint (OECD, 2004, ch. 3; European Commission,

2011); for instance over the period 2000-2004, wage increases in the EU25 (+1,0%) have been well below the rates of productivity growth (+2 %) and all evidence confirms, as signaled by the 2010 Report on Industrial Relations in Europe:

> *"a widespread practice of wage moderation in which real wage growth is kept below productivity growth. Wage moderation has been a consistent feature of wage setting in the past two decades...One manifestation has been the continuous decline of the labour' s share of total income in the EU." (p. 127)*

A topic further explored below.

Union bargaining power

The wage-profit split is crucially caused by country wage setting systems and the bargaining practices of European countries are usually those formalised by the 'right to manage' scheme (Layard et al. 2001), where firms and unions bargain over wages and then firms set employment unilaterally, taking wages as given[10].

The explicit solution for the wage rate, in a generalised Nash bargaining, gives that an increase in the union bargaining power shifts the 'wage rule' (the combinations of wage rates and employment achieved in the labour market) upwards, with unequivocal negative effects on employment (see Appendix A.2.). In addition, the wage solution is dependent on union preferences. For instance, for a union utility function (*V)*, with the Stone-Geary functional form (Oswald, 1985), one has:

$$V= (w-r)^{\delta} (L-z)^{\lambda}$$

where r and z are minimum or references values of wages (w) and employment (L), while δ and λ give their relative importance to the union. This functional form has the advantage of nesting as special cases specific assumptions on union preferences[11] and allows to obtain that increases of δ and λ (the respective weights of remunerations and employment in union preferences) cause opposite effects on bargained pays: when λ is higher, union wage claims are more moderate, under the constraint of labour demand (Manning, 1990).

Empirically, the existence of a robust association between union density and wage restraint might be interpreted as a likely effect of more concern for employment stability, as we will test with our estimates.

Product market regulation

In recent years, various reforms have been introduced to reduce rents in the goods markets in European economies and thus a natural experiment is to verify their prevailing effects in terms of changes in *LS*.

[10] In a second model, the efficient bargaining, both wages and employments are bargained over and the contract curve, which slopes upwards in wage-employment space, is obtained by tangency points between union's indifference curves and isoprofit contours (Mc Donald and Solow, 1981).

[11] For instance, the wage bill utility function is obtained for $r=z=0$ and δ and $\lambda = 1/2$, while the rent utility function (i.e. the case where union wants to maximise the excess of the wage bill paid to its members) is obtained for $z=0$ and $\delta=\lambda=1/2$. Finally, $\lambda=0$, gives the seniority model, i.e. the case where unions only care about utility of their members.

As known, the original argument provided by Kalecki (1971) was that greater competition should have caused erosion of monopolistic positions and the squeeze of profits, with a consequent increase in the labour share. Interacting effects of non competitive product and labour markets were later formalised in Neo Keynesian models that showed that the presence of unions reverses the traditional Kaleckian relation in that unions manage to appropriate part of the firm's rents. Hence, product market power that creates rents also opens the space for their distribution between capital and workers and, thus, may have a positive impact on wages (Nickell et al. 1994).

In recent years, multiple channels through which competitive conditions can influence labour market outcomes have received attention by the vast empirical research conducted by the OECD studies. Pro-competitive product policies, that raise the elasticity of product demand, exert moderating influences in wage requests and, through the channel of labour demand, an expansion of employment, as empirically tested by Bassanini and Duval (2006). Furthermore, competitive measures represented by lower barriers to entry, exert positive effects on *LS*. Indeed, pro market deregulation that encourages entrance of new firms causes an aggregate output expansion and a rise in wages and labour demand, with unambiguous (positive) effects on labour income share (as formalised by Blanchard and Giavazzi, 2003).

Notice, however, that empirical studies use the OECD aggregate indicator for product market regulation (*PMR*) that covers various areas; these areas range from public control and price control, to barriers to trade and legal and administrative barriers to entry (Conway, Janod and Nicoletti, 2005). The expected effects of these different provisions may diverge. For provisions that measure the intensity of competitive pressures, positive effects on *LS* are likely. However, for some others, such as privatization programmes, measured by the OECD indicator as a shift toward pro-competitive policies, the likely effect is job shedding, and through this channel, a contraction of labour share, as found for the network industries by Azmant, Manning and Van Reenen (2012). Thus, the expected final effect of *PMR* on labour shares remains ambiguous.

4. Evidence

4.1 Data

Our empirical investigation relies on several databases: EU KLEMS accounts for the labour share, and the capital-output ratio, the OECD indexes for employment protection and product market regulation, Visser database for measures of collective relations, i.e. union density and bargaining coverage, and EUROSTAT for employment series (see Appendix, Table A1).

Our dependent variable is the labour share that measures the fraction of national income accruing to labour. Unfortunately, information concerning wages and salaries is not available in the EU KLEMS database, thus this variable is proxied by the ratio of total compensation of employees (wages and salaries before taxes, as well as employers' social contributions) over gross domestic product.

This measure underestimates labour share because it excludes incomes generated from self-employment, which are considered mixed income (from property and labour), and whose attribution to either labour or capital is questionable. A number of solutions have been proposed, such as that of including all self employment incomes - or a fraction of these- in labour share; in this case a second question is that of a proper measure of wages of self employees, solved by ad hoc assumptions of attributing them the same wage of dependent workers. We prefer performing our estimates by using unadjusted labour shares (i.e. without self-employment), also to prevent confounding effects, since employment protection legislation only covers employees. In addition, with this choice we avoid assumptions that are controversial, and that usually provide questionable values, as pointed out by Daudey and García-Peñalosa (2007). In any case, we offer below a comparison of descriptive statistics for adjusted and non adjusted labour shares to evaluate the different importance of self-employment in different countries. As we shall see, in some countries self-employment is not negligible; for this reason we shall also consider this category of labour as control variable in our econometric analysis.

The first step of our research involves matching the several database we use and carrying out disaggregated analyses at sector and country levels. First, the availability of data and the needs for a large and consistent sector-country profile led us to select only 14 countries out of the 27 European Union members and to re-arrange the NACE rev.1 sections into 9 industries.

This made it possible to compare the following economies: Austria, Belgium, the Czech Republic, Denmark, Spain, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Sweden, and the United Kingdom. This selection, as noted above, was dictated by data availability and includes two sets of countries: i) 12 Old Member States; ii) 2 New Member States. The second small set comprises Hungary and the Czech Republic, two "market-oriented" economies with some similarities to the Anglo-Saxon countries (European Commission, 2004).

The selected sectors consist of: 1) Agriculture; 2) Mining and Quarrying, 3) Manufacturing; 4) Energy sectors), 5) Construction, 6) Wholesale and Retail Trade, 7) Hotels and Restaurants, 8) Transport, Storage and Communications, 9) Financial Intermediation, Real Estate and Business Services.

The EUROSTAT database was used to gather the share of workers with temporary contracts to total employees at sector-country level. Indeed, as seen below, we used a difference-in-difference model, and introduced the sectoral average level of the share of temporary workers in the UK as a benchmark, i.e. as the underlying propensity to use temporary workers in the absence of *EPLT*.

Lastly, UK industry-level layoff rates, defined as the percentage ratio of annual lay-offs to total employment, were introduced as a proxy for lay-off propensity in the absence of *EPLR*, and were obtained from the waves of the UK Quarterly Labour Force Survey, released by the Office of National Statistics.

4.2 Descriptive evidence

Before testing the role of the different driving forces behind the country-sector labour income shares, we have a closer inspection of data. To summarise, from descriptive statistics emerge some relevant points:

- in most countries factor shares present a sluggish or declining trend, with total average values in the two sub-periods, 1995-2001 and 2001-2007, close to 49% and 48%, respectively;
- an increasing degree of variation between the different economies is recorded over time, but the labour share remains more heterogeneous across sectors, rather than across countries;
- the change of the weights of various sectors has had only limited influence in explaining labour share movements, whereas changes of labour share *within* sectors play a dominant role.

More details are offered below. Table 1 reports information by countries and shows, for the period 1995- 2007, an average value of *LS* of about 49%, but also large differences across European economies. The lowest figures are recorded in Italy (38%), the highest in Denmark, Sweden (approximately 55%) and UK (56%). Italy, after Ireland, also records the lowest minimum value, whereas we find again Denmark (57%) Sweden and UK (58%) as the countries at the top for maximum values. A plausible explanation of the UK position relies on the sectoral specialisation of this country, mainly oriented to high labour intensive sectors, such as services. As we shall see below, our econometric analysis addressing causal link between *EPLT* and labour share by country-sector estimates allows us to take into account these sectoral composition effects. From our data an increase in country differentials also emerges, since the standard deviation passes from 4.99 in 2001 to 5.81 in 2007 (see Table 2, Panel A)

INSERT TABLE 1

INSERT TABLE 2

Country differentials may be related to differences in the structural composition of employment, as shown by the comparison between non adjusted and adjusted labour shares (that include self employment) (Figure 1). Indeed, Italy is characterised by the highest incidence of self employment, a fact that contributes to explain its lowest position in terms of non adjusted labour share. Thus, the inclusion of self employment makes a significant difference, and Italy is no more in the lowest position but, in any case, it remains in the bottom range.

INSERT FIGURE 1

Additional information regarding time variations are obtained by splitting the sampled period in two intervals: 1995-2001 and 2002-2007. A visualisation is given in Figure 2, which shows the declining or stable tendencies recorded for 10 EU economies (out of fourteen) in the sub-period 2002-2007. Also, notice also that two of the four countries that in this sub-period have recorded a slight increase (Italy and Ireland) are, in

any case, those in the lowest position and that registered a remarkable negative trend in the first sub-period (1995-2001). Conversely, Germany, Belgium and Netherlands, whose values of *LS* are above the average levels in each sub-period, record the highest reductions in the second sub-period (-4.3, -2.7 and -2.6 percentage points, respectively).

INSERT FIGURE 2

Other meaningful heterogeneities are displayed by sectoral data: Table 3 reveals ample divergences, higher than those observed by countries. The lowest figures of *LS* are in Agriculture (27%) and the highest in Construction and Hotels& Restaurants (about 60%), followed by Manufacturing (59%). Interestingly, for services, the Financial and Real Estate sector reaches one of the lowest figures (only 37%), and after Transport and Communications, also the lowest coefficient of variation. Further, Table 2 (Panel B) also shows the high and increasing standard deviations of *LS* across sectors.

A comparison of adjusted and non adjusted LS by sectors confirms the highest position of Construction and Hotels&Restaurants, but also shows that when self employment is taken into account, Trade and Agriculture get a higher position, higher than that recorded in Manufacturing.

INSERT FIGURE 3

The ample differentials by sectors led us to verify if the steady or declining changes recorded in almost all countries since the mid-1990s could also reflect the growing importance of sectors with stable or declining *LS*, whose weight on aggregate income is boosted with respect to those characterised by increasing *LS*.

Indeed, as seen in Arpaia et al. (2009), three different effects may operate. The first is the change in the *weights* of each sector; the second is the change in labour shares *within* sectors, the third is the changing structure of total employment represented by variations in the share of self employees. We thus have the following expression:

(1)

$$\Delta ALS_t^{sd} = \underbrace{\sum_{i=1}^{k} \frac{CE_{i,t} * TE_{i,t}}{va_{i,t} * E_{i,t}} * \Delta\omega_{i,t}}_{\text{Sectoral composition effect}} + \underbrace{\omega_{i,0} * \frac{TE_{i,0}}{E_{i,0}} * \Delta\frac{CE_{i,t}}{va_{i,t}}}_{\text{Employees' remuneration effect}} - \underbrace{\frac{CE_{i,t}}{va_{i,t}} * \frac{1}{q_{i,t}} * \omega_{i,t} * \frac{\Delta q_{i,t}}{q_{i,0}}}_{\text{Employment structure effect}}$$

where ΔALS is the change in aggregate adjusted labour share, *CE* are compensation of employees, *va* is the national value added, *TE* and *E,* total employment and employment, respectively, ω the weight of each *i* sector on national value added, *q* the ratio *E/TE*, *i*=1, ...9 sectors, *t*=1995,...2007.

The first term of (1) can thus measure the quantitative importance of the *compositional bias*, i.e. the role played by changes in the sectoral composition recorded in the 14 European economies of our sample, whereas the second and third terms describe, respectively, the employees' remuneration effect and the employment structure effect (i.e. the contribution of self-employed) mentioned above. A comparison of these effects is shown in Figure 4.

INSERT FIGURE 4

Figure 4 makes it clear that the sluggish or declining movement of the aggregate labour share recorded in most countries is mainly due to moderation of labour compensations *within* countries (the remuneration effect), whereas it only partially reflects a shift from high labour intensive industries to the low labour intensive sector. Sectoral composition effect is, in any case, not negligible and almost always contributes negatively to labour share changes. On the contrary, employment structure effect contributes positively and for most countries partially offsets the negative contribution of the other two factors. This analysis thus shows that compositional biases are insufficient to explain the observed trend of labour shares and motivates us to explore the role of institutional reforms.

Indeed, there have been changes in labour and product market policies and as assessed by the IMF (2007, p.170), "Reforms have proceeded in several areas, but generally in the direction of lowering the cost of labour to business and enhancing the flexibility of markets". One of the main developments in labour market policies is particularly worth noting; it is the substantial decline in legislated employment protection. Job protection is usually measured by using two time-varying cross-country data: the OECD Employment Protection Legislation index for regular contracts (*EPLR*) and, for temporary contracts (*EPLT*)[12]. The changes recorded for our sampled countries, as shown in Figure 5, confirm that the greatest relaxation in strictness of rules is recorded for temporary contracts. Reforms for these types of contracts have characterised various countries and have been more important than changes in rules for regular contracts. Indeed, a broad picture of cross-country differences in *EPLR* shows that low and high *EPLR* countries have kept statutory protection of regular jobs almost unchanged (see also Venn, 2009).

INSERT FIGURE 5

The role of employment protection restrictive stances across Europe is a matter of further explorations with our estimates.

4.3 Estimates

Estimation strategy

In this section we estimate our key equation for labour share (*LS*), and two supplementary equations concerning employment and average compensation (that is the ratio of total labour compensation on employees). Such a strategy allows us to verify how each explanatory variable influences the labour share and its components.

[12] The *EPLR* OECD index refers to eight items which weigh three major groups of restrictions: i) procedural inconvenience (such as notification procedures), ii) severance pay, and iii) difficulty of individual dismissals (definition of unfair dismissal and related items). The *EPLT* index includes norms for fixed-term contracts and temporary work agency employment. For both types of contract, the OECD sub-indexes include information on the valid cases for which these types of contracts are legal, restrictions on the number of renewals, and their maximum cumulated duration (OECD, 2004). A revised OECD indicator covers a third area, i.e., restrictions on collective dismissals (*EPLC*). *EPLC* has only been available since 1998 and this does not allow comparisons over our observation period (1995-2007).

We estimate the impact of the degree of stringency of *EPLT* on cross-industry differences, by following the literature based on the difference-in-difference method inaugurated by Rajan and Zingales (1998) in the finance literature and applied to labour analyses by Bassanini, Nunziata and Venn (2009). The estimates, for our sample of 9 industries in 14 EU economies, exploit both variations in the regulation across countries and the different influence of regulation in different sectors. We estimate the role of *EPLT* considering whether its impact is greater on industries in which, in the absence of regulations, the propensity to employ temporary workers would be higher. The 'natural' degree of adoption of temporary contracts at the industry level is thus measured computing the adoption of these contracts in a country with no employment regulation. In this country we assume that the ranking of variability across industries is a good proxy of the 'intrinsic' sectoral differentials in terms of temporary contracts. The interaction between a country level variable (*EPLT*) and a sector level variable for temporary contract rates for this country, allow us to identify the causal effect of employment protection on labour share.

Analogously, we control for the role of *EPLR* assuming that the effect of liberalisations of regular jobs is more important in industries where the layoff propensity is higher.

The UK temporary contract rates (TWS_Bench_i) or lay-off rates ($LO.Bench_i$) for each industry *i* are used to proxy for the natural propensity of industries to make high recourse to numerical flexibility in labour arrangements. Indeed, we assume that in the UK the lowest stringency in labour protection (both for temporary and regular workers) make differences in employment decisions among sectors only motivated by technological and other sector-specific factors, irrespective of influences caused by protection legislation. Each equation thus includes the interaction terms $TWS\_Bench_i*EPLT(j,t-1)$ and $LO\_Bench_i*EPLR(j,t-1)$, where $Bench_i$ is the UK value.

In some specifications we also include other institutional controls available only at country level such as Union density (*UD*) and bargaining coverage (*COV*). Following the same strategy, we have estimated their role by including the interaction terms $LO\_Bench_i*UD(j,t-1)$ and $LO\_Bench_i*COV(j,t-1)$, the hypothesis being that the protective role of worker representatives and of coverage of collective negotiations is higher in those sectors that are more exposed to threats of dismissals, i.e. with higher layoff rates. Each specification includes the main effect, that is the control for the labour institutional variable at country level, and the interaction terms discussed above. The last institutional control variable we insert is Product Market Regulation (*PMR*), available at the sector-country level, and thus does not need an interaction term.

In addition, our linear regression model includes another key control variable, discussed in section 3: the capital/output ratio (*K/Y*). As robustness check, we also take into account, in additional estimates, the ratio of employees/total employment (*q*), that allows us to control for the country-sectoral differentials in employment structure (employees and self-employed).

Finally, we include country by year dummies, D_{it}, to control for country specific changes (including business cycles) that may condition movements of *LS* and sector dummies D_j to control for highly sector-specific factors which probably influenced our dependent variables and which cannot be captured by means of the labour policy variables included in our analysis. For instance, a larger array of labour institutions should be included as determinants of *LS*, but are omitted due to the lack of availability of time-varying data, among others unemployment protection (measured by replacement ratios and duration of unemployment benefits) as well as active labour market policies. Other country-sector specific factors, such as the role of technological progress and openness to trade, discussed in Section 2, are captured by the set of dummy variables included in our specifications.

The same specifications adopted for *LS* are replicated for its components, i.e. *Comp* and *Empl*.

$$LS_{i,j,t} = \beta_0\, EPLT_{j,t-1} + \beta_1 \text{TWS\_Bench}_i * EPLT_{j,t-1} + \beta_3 EPLR_{j,t-1} + \beta_4 \text{LO\_Bench}_i * EPLR_{j,t-1} + \beta_5 \text{LO\_Bench}_i * UD_{j,t-1} + \beta_6 \text{LO\_Bench}_i * COV_{j,t-1} + \beta_7 PMR_{i,j,t-1} + \beta_8 KO_{i,j,t} + q_{i,j,t} + D_{j,t} + D_i + \varepsilon_{i,j,t}$$

$$Ln(Empl)_{i,j,t} = \beta_0\, EPLT_{j,t-1} + \beta_1 \text{TWS\_Bench}_i * EPLT_{j,t-1} + \beta_3 EPLR_{j,t-1} + \beta_4 \text{LO\_Bench}_i * EPLR_{j,t-1} + \beta_5 \text{LO\_Bench}_i * UD_{j,t-1} + \beta_6 \text{LO\_Bench}_i * COV_{j,t-1} + \beta_7 PMR_{i,j,t-1} + \beta_8 KO_{i,j,t} + q_{i,j,t} + D_{j,t} + D_i + \varepsilon_{i,j,t}$$

$$Ln(Wage)_{i,j,t} = \beta_0\, EPLT_{j,t-1} + \beta_1 \text{TWS\_Bench}_i * EPLT_{j,t-1} + \beta_3 EPLR_{j,t-1} + \beta_4 \text{LO\_Bench}_i * EPLR_{j,t-1} + \beta_5 \text{LO\_Bench}_i * UD_{j,t-1} + \beta_6 \text{LO\_Bench}_i * COV_{j,t-1} + \beta_7 PMR_{i,j,t-1} + \beta_8 KO_{i,j,t} + q_{i,j,t} + D_{j,t} + D_i + \varepsilon_{i,j,t}$$

where $Ls_{i,j}$, $Empl_{i,j}$, $Comp_j$ are the labour share, employment, average compensation in *i=1,...9* sectors, *j=1,...14* countries, *t= 1995, ...2007* years.

According to Azmat, Manning and Van Reenen (2012) in order to address the normality assumption requested in the OLS regression, we take our dependent variables Empl and Comp in log, and apply the Newey-West technique to correct for heteroschedasticity and first-order serial correlation.

4.4. Results

Main results

Table 4 lists the estimates for *LS*. The first column reports the results of a baseline specification in which only the capital-output ratio and *EPLT* (i.e. our key institutional determinant of labour share at country level, without the interaction term) are included. As one can see, protection for temporary workers exerts a positive influence on labour share.
In a second specification, (column 2), we rule out potential confounding factors and insert *EPLT,* interacted with the share of temporary contracts at the sector level in the UK, i.e. the interaction term TWS_Bench_i*$EPLT$. As mentioned above, we have treated estimated coefficients of *EPLT,* interacted with indicators of temporary contracts, as evidence of a causal impact of regulations on cross-industry *LS* differences. Thus, the variable of main interest in our analysis is TWS_Bench_i*$EPLT(j,t-1)$. The results we obtain confirm that the stringency of protection level for temporary workers positively affects the labour share.

More precisely, in this case the *diff in diff* estimates suggest that *LS* tends to be lower in industries with greater propensity to use temporary contracts, the less stringent the level of *EPLT*. This main finding is confirmed in all specifications (columns 3-8), that allow controlling for other variables, i.e. *EPLR*, union density *UD*, coverage bargaining (*COV*), and their interaction (*UD*COV*), product market regulation (*PMR*) and the employment structure (q).

In order to better evaluate the meaning of our key result (i.e. the coefficient of TWS_Bench_i*$EPLT$), let us consider, for example, two sectors, Construction and Manufacturing with different natural propensities to employ temporary workers, since in the UK (the benchmark case) the share of temporary workers in Construction is 5.18%, whereas it is only 3.90% in Manufacturing. We can now quantify, on the basis of our estimates for the period 1995-2007, the difference of *LS* changes between these two sectors recorded in different countries, and explained by their respective *EPLT* stances. We compare Italy, the case with the greatest reduction in *EPLT* (-3.5), with Belgium and the Netherlands, two countries that have recorded slighter reductions in *EPLT* (-2 and -1.19, respectively). We get the results shown in Table 5.

In Table 5, columns 1, 2 and 3 report, respectively, the values of *LS* changes in Construction and Manufacturing, and their difference in each economy. Column 4 shows the estimated coefficient β for *EPLT* in baseline specifications (columns 2 and 3 of Table 4), columns 5 of Table 5 reports the different natural propensities to use temporary contracts, $\Delta\Lambda$ (obtained from the values of the UK) and column 6 the reduction of *EPLT* of the three economies, $\Delta EPLT$. Finally, column 7 and 8 show the values (absolute and in percentage, respectively) of the reduction of *LS* explained by a lower level of labour protection. The result we obtain, taking our estimates at face value, is that for Italy more than 90% of the difference of *LS* changes between Construction and Manufacturing is explained by weakening of *EPLT*. This means that the Italian functional distribution of income appears to be significantly influenced by its far reaching liberalisations of the labour market that contributed to instability of working conditions and other significant figures can easily be obtained for other country-sectoral comparisons.

In previous section we have assumed that higher degree of *EPLT* has a positive effect on wages and null or negative influence on employment[13]. These results are confirmed in our equations for compensation (*Comp*) *(*Table 6*)* and employment (*Empl)* (Table 7), while the overall impact on labour shares (*LS)* is positive (Table 4).

These results suggest that reforms to liberalise the use of temporary workers and reduce *EPLT* may be perverse: when firms are allowed to hire workers on fixed-term contracts they pay lower wages, offer less training and give few opportunities for career advancement.

Indeed, the use of fixed term contracts and the consequent segmentation of internal labour market within firms enhances the opportunity costs of labour and may raise coordination failures. On the opposite, in line with the 'high performance" paradigm'(Delaney and Godard, 2000), innovative' management strategies lead companies to providing employees with provision of job security, low turnover rates and "empowerment" HR practices, that include participation, team cooperation, internal labour markets and opportunities inside the firm.

Other results

It is important to also discuss the main results concerning control variables. In particular, the coefficients we obtained for union density, coverage bargaining, protection levels for regular workers (*EPLR*) are worth noting.

For unionisation one can expect that this variable, as a proxy of worker bargaining power, may have counterbalanced the negative effects of liberalisation of labour market for temporary workers. Notice, however, that labour share dynamic is conditioned by the intensities of wage push and employment changes that also reflect the respective weights of these variables in union preferences.

We have estimated the role of *UD* on *LS* interacted with layoff propensity in order to test the more significant impact of unions on those sectors where their representatives are more exposed to risk of being fired. Our results show that unionisation has played a negative role on *LS*, as seen from the values of coefficients associated with *LO_Bench*UD(j,t-1)* in *LS* estimates (columns 4, 6,7, 8 of Table 4). This result is also obtained when we control for coverage of collective bargaining. From additional estimates for *LS* components, it emerges that unionisation, which is a proxy for worker bargaining power, has exerted a positive role only on employment levels (Table 7, columns 4, 7, 8) and a negative impact on compensations (Table 6, columns 4,6,7,8). This seems to suggest that worker representatives have attached greater weight to employment stability and accepted compensative policies based on wage moderation. Paradoxically, it configures a sort of 'reversal' of the standard right to manage model, i.e. a situation where unions have bargained over employment and reduced wage claims, accepting pay conditions imposed by labour demand.

[13] Indeed, in previous section we simmetrically said that liberalisation of labour market for temporary contracts depresses wages but benefits employment.

It is interesting to note that these results are coherent with estimated coefficients of *EPLR*, interacted with the indicator of layoff propensity, significant and negative in *LS* and compensation estimates (Table 4 and 6) and positive in employment specifications (Table 7): compensations tend to be lower in industries (with a greater propensity to layoffs), when the level of *EPLR* is more stringent, whereas opposite effects emerge for employment. This implies, as predicted from the implicit contract theory, that jobholders have signed a tacit agreement based on acceptance of lower pays as an 'insurance premium' for job security, thus protecting themselves from employment fluctuations. This suggests a change in the union preferences from wage claims to employment stability.

We also control for *PMR* and obtain that high degrees of product market regulation have positive effects on *LS*. Notice, as stated above, that the OECD indicator for product market regulation (*PMR*) also covers privatization programmes, measured as a shift toward pro-competitive policies, whose likely effects are restructuring processes and staff reduction, as found for the network industries by Azmat, Manning and Van Reenen (2011). From our estimates, in any case, no significant influence on compensation and employment components have been obtained. The weak evidence for compensation and employment effects may thus be the result of different deregulation programmes, which include both privatisation process as well as increases of the degree of product market competition in private sectors, with likely differential effects on labour market outcomes. Further research in this area may shed light on the various impacts of these different policy reforms for the whole set of industries analysed in our sample.

Finally, it is worth noting that our key non-institutional control variable (i.e. capital-output ratio) is related to the different technologies, which vary across industries, and that we capture with capital intensity. The negative coefficients associated to *K/Y* obtained in our estimates for *LS* indicate a significant substitutability between labour and capital, meaning that an increase in the capital-output ratio is associated with a smaller labour share.[14]. The negative effects for compensations are consistent with the hypothesis of Hicks's labour saving technical progress, i.e. with an increase of the ratio of the marginal product of capital to that of labour (Hicks, 1932, p. 121). These negative effects could also be justified by a scarcity of high-skilled workers, caused by the diffusion of temporary workers, that negatively influences rewards also in capital intensive industries (see Acemoglu, 2009 for a paper that studies the conditions under which scarcity of labour stimulates changes in technology adoption).

An alternative consideration is that *K/Y* is likely to be endogenous to *LS* and we cannot interpret the estimated coefficients of the capital output ratio in terms of evidence of a causal impact, an issue addressed below.

[14] Obviously this is a very general result that needs additional exploration in future research. In our case detecting if substitutability between capital and labour also holds in contexts in which we distinguish between different typologies of capital (i.e. ICT and no-ICT capital) and labour (high skilled vs. low skilled workers) is out of the scope of the paper.

Endogeneity

Capital output ratio as well as *EPLT* reforms may be conditioned by changes in factor distribution and thus these potential feedbacks (from our dependent variables and these regressors) may induce a cautionary interpretation of previous results[15]. A robustness check is carried out by instrumental variables estimates. This method requires finding instruments that can predict the level of *EPLT and of K/Y*, without affecting directly the dependent variable. Since the choice is not simple, we have decided to use lagged values as instruments and have obtained the results shown in Table 8.

From the endogeneity tests, the hypothesis of endogeneity of *K/Y* on wage equations cannot be rejected (see also Table A.2) whereas we can reject endogeneity of *EPLT* (with the interaction term) for *LS* and its component. What is relevant, in any case, is that IV estimates confirm our main findings.

5. Conclusions

The impact of labour market reforms that have lowered protection of temporary contracts has been documented in a number of works, but their effects of income distribution is still an open question. We have analysed this issue by considering country-sector evidence for 14 EU economies and a sample period, 1995-2007, up to now not covered by related literature.

Our focus on changes in the stringency of employment protection of temporary jobs has allowed us to show that these reforms, that have contributed to instability of working conditions, have negatively influenced the labour share, thus failing to contrast the declined trends in the labour share recorded in previous decades.

Indeed, we estimated labour share, as well as its components, compensation and employment, and consider a whole set of control variables. We obtained that legislative innovations that have favoured the extensive use of temporary contracts have likely favoured the access of additional workers (likely young and women) to the labour market, but have at the same time penalised the rewards of all employees, insiders as well as entrant marginal workers. Thus the overall balance of employment and compensation effects has been negative, as our estimates for the income share accruing to workers seem to suggest.

These findings have been validated by various robustness checks. We have controlled for employment protection of regular workers, characteristics of wage setting, product market regulation and capital-output ratio. What we have found, taking into account this whole set of variables, is that in a scenario of precarious working conditions, employees and their representatives have exerted their bargaining power to moderate their wage demands, thus paying an implicit insurance premium against the risk of employment fluctuations.

Our final considerations concern policy implications. Sluggishness of labour share calls for political interventions not covered in the 1994 Jobs Strategy. Real wages, growth

[15] Actually, the difference-in-differences strategy is also set up to solve this problem (Bassanini, Nunziata and Venn, 2009). Nevertheless, in order to guarantee more robustness to our result we decided to perform endogeneity tests by means of the instrumental variable method.

job quality, and living standards must be components of an integrated strategy along the lines suggested (but not sufficiently implemented) by a Restated Job Strategy, which in 2006 advocated as crucial issues "Improving labour force skills and competences through wide-ranging changes in education and training systems."(OECD, 2006, p. 24) However, as documented for European countries by the EU Commission, in the last few years several countries have gone in opposite direction, loosening employment protection legislation for permanent contracts "in view to align it with protection of temporary contracts, and further deregulating temporary contracts" (EU Commission, 2011, p. 37)[16]. Our key message is that this kind of reforms may lead only to transitory employment gains, whereas they exert persistent offsetting effects on income distribution of temporary workers, who see deteriorate their pays and career prospects. Opposite policies, more favourable to labour shares, could sustain demand and give actual boost to faster growth.

Appendix

A1 LS moves counter-cyclically under *EPL*

We show that even in standard neoclassical model, based on a unitary elasticity of substitution between capital and labour, the presence of uncertainty in a friction economy, thus characterised by *EPLT*, implies that *LS* is no more constant but moves counter-cyclically (Kessing, 2003). Indeed, firing-hiring costs influence not only current profits, but also the whole stream of expected future profits (Bentolila and Bertola, 1990) and cause a discrepancy between the marginal revenue product of labour and the real wage (Bentolila and Saint Paul (2003). In cases of adverse economic conditions (bad states, *b*), firms hoard some workers, paying them a wage rate *w* equal to the marginal product of labour ($MRPL_b$) *plus* the firing cost *f* (the adjustment cost they avoid if give up from firing), i.e. $w_b=MR^g{}_b+ \varphi b$. Conversely, in good states *g*, the wage rate equates the marginal revenue product of labour *less* the expected discounted value of firing costs, since the firm takes into account the likely necessity of firing in next periods (higher uncertainty might be expected to increase the likelihood that a worker be fired) and thus cuts the current wage, so that $w_g= MRPLg - \varphi_g$.). Thus labour share is higher in downturns and lower in upturns.

Indeed, one gets: $w_b=MR^g{}_b+ \varphi b$ and $w_g= MRPLg - \varphi_g$. For a Cobb Douglas technology ($Y= K^{\alpha}L^{(1-\alpha)}$) and a markup μ, one easily gets:

$$LS= \mu [(1- \alpha) w]/ (w- \varphi_b)$$

$$LS= \mu [(1- \alpha) w]/ (w+ \varphi_g)$$

which give that labour share is higher in downturns and reduced in upturns. Indeed, the first order condition for profit maximisation gives $(wb- \varphi b) = \mu(1- \alpha)Y/L$ and hence one obtains $L= \mu (1- \alpha) Y/(wb- \varphi b)$, so that $LS= \mu [(1- \alpha) w]/ (w- \varphi_b)$. Analogously, one can obtain *LS* for good states $LS= \mu [(1- \alpha) w]/ (w+ \varphi_g)$.

[16] The EU Commission, in the Annual Growth Survey 2012, does not mention explicit recommendations to Member States for temporary contracts legislation and considers that Member States should give priority to: "Reforming employment protection legislation in consultation with social partners, reducing the excessive rigidities of permanent contracts and providing protection and easier access to the labour market to those left outside, in particular young people." (p.11)

A.2 The Right to manage model and the role of union preferences

Assuming an asymmetric Nash bargaining scheme, the wage solution is a function of the parties bargaining power, of their respective objective functions and of their threat points, the fall-back positions in case of disagreement. The generalised Nash bargaining solution emerges from the following maximisation programme:

$$\max\ \Omega_{w^c} = (V(w^c, L) - \overline{V}(r))^{\beta} (\pi((w^c, L) - \overline{\pi})^{1-\beta} \quad (A1)$$

where V and π are, respectively, the union utility and the firm's profit, w^c is the company remuneration, L is the company employment level. r (the reservation wage) and $\overline{\pi}$ (the minimum level of profits) are the solutions in case of disagreements.

The first order condition for maximisation of Ω gives the following:

$$\beta \frac{V'}{V - \overline{V}} = (1 - \beta) \frac{\pi'}{\pi - \overline{\pi}}$$

where V' and π ' are the first derivatives of V and π with respect to w^c and expresses gains of each party (weighted by their respective powers), which condition distribution of national income. The explicit solution of (A1), that determines labour share, requires that union preferences and constraints are considered. A convenient characterisation of the union utility function V, as reviewed in Oswald (1985) is the Stone-Geary functional form:

$$V = (w-r)\delta\ (L-z)\lambda$$

where r and z are minimum or references values of wages (w) and employment (L), while δ and λ gives their relative importance to the union.

The closer is λ to 0, the lower is the mark-up of the wage rate to the reservation value r. Indeed, if we assume $\delta = 1 - \lambda$, so that $V = (w-r)(1-\lambda)\ (L-z)\lambda$, a Cobb Douglas production function $y = L^{\alpha}$, and a constant elasticity of product demand θ, it is possible to obtain the wage equation:

$$w_{w^c} = \frac{\beta\lambda + (1-\beta)\ \alpha')}{\beta\lambda + (1-\beta)\alpha' - (1-\alpha')\beta(1-\lambda)} r$$

where $\alpha' = \alpha(\theta - 1)/\theta$, which gives $w=r$ for $\lambda=1$, i.e. the wage mark-up over the reservation wage is null if union cares only about employment. (Manning, 1990)

REFERENCES

Acemoglu, D. 2009, When Does Labor Scarcity Encourage Innovation? NBER Working Paper No. 14809

Arpaia, A. Pérez, E. and Pichelmann, K. 2009. Understanding Labour Income Share *Dynamics in Europe, European Economy*, Economic Papers, EU Commission, 379| May

Arulampalam, W., Booth, A. and Bryan, M. 2004. Training in Europe, *Journal of the European Economic Association*, vol. n.2-3, 346-360

Atkinson, A. b. 2009. Factor shares: the principal problem of political economy? *Oxford Review of Economic Policy*, vol. 25, n. 1, 3–16

Azmat, G., Manning, A. and Van Reenen, J. 2012. Privatization and the Decline of Labour's Share: International Evidence from Network Industries, *Economica,* vol. 79, n.315, 470-492

Barro, R.J. and Sala-I-Martin, X. 1995. *Economic Growth*, McGraw-Hill, Inc. New York

Bassanini, A. and Duval, R. 2006. Employment patterns in OECD countries: Reassessing the role of policies and institutions, *OECD Economics Department Working Papers*, No. 486, OECD Publishing

Bassanini, A. et al. 2007. Workplace in Europe, in Brunello, Garibaldi and Wasmer (eds.), *Education and Training in Europe*, Oxford University Press, Ch. 8 – 13

Bassanini, A., Nunziata, L. and Venn, D. 2009. Job Protection Legislation and Productivity Growth in OECD Countries, *Economic Policy*, vol. 24, n.58, 349-402

Belot, M., Boone, J. and van Ours, J.C. 2007.Welfare-Improving Employment Protection, *Economica*, vol. 74, n. 295, 381-396

Bental, B and Demougin, D. 2010. Declining Labor Shares and Bargaining Power: An Institutional Explanation, *Journal of Macroeconomics*, vol. 32, n.1, 443–456

Bentolila, S. and Bertola, G. 1990. Firing costs and labour demand: how bad is eurosclerosis?, *Review of Economic Studies*, vol. 57, n.3, 381–402

Bentolila, S. and Saint-Paul, G. 2003. Explaining Movements in the Labor Share, *Contributions to Macroeconomics*, vol. 3, n.1, art.9

Bertola, G. 1999. Microeconomic Perspectives on Aggregate Labor Markets" in Ashenfelter, O. and Card, D. (eds.) *Handbook of Labor Economics*, Volume 3C, Amsterdam: North-Holland, 2985-3028

Bertola, G. 2009. Labor Market Regulation: Motives, Measures, Effects, *ILO, Conditions of Work and Employment Series* No. 2

Blanchard, O. 1997. The Medium Run, *Brookings Papers of Economic Activity*, vol. 0, n. 2, 89-141.

Blanchard, O. 1998. Revisiting European Unemployment: Unemployment, Capital Accumulation and Factor Prices, *NBER Working Paper* n. 6566.

Blanchard, O. 2000. Lecture 2: Rents, Product and Labor Market Regulation, and Unemployment, *Lionel Robbins Lectures*, London School of Economics, London.

Blanchard, O. and Giavazzi F. 2003.'Macroeconomic effects of regulation and deregulation in goods and labor markets, *Quarterly Journal of Economics*, vol. 118, n.3, 879–908

Blanchard, O. and Landier, A. 2002. The Perverse Effects of Partial Labour Market Reforms: Fixed Duration Contracts in France, *The Economic J*ournal, vol.112, n.480, F214 -F244.

Bloom, N. And Van Reenen, J. 2007. Measuring and Explaining Management Practices across Firms and Countries, *The Quarterly Journal of Economics*, vol. 122, n. 4, 1351-1408

Booth, A.L., Francesconi, M. and Frank, J. .2002. Temporary Jobs: Stepping Stones Or Dead Ends?, *The Economic Journal*, vol.112, n.480, F189–F213

Bresnahan, T., Brynjolfsson, E. and Hitt, L. 2002. Information Technology, Work Organization and the Demand for Skilled Labor: Firm-Level Evidence, *Quarterly Journal of Economics,* vol.166, n. 2, 339–76

Caballero, R. and Hammour M. 1998, Jobless growth: Appropriability, factor substitution and unemployment', Carnegie-Rochester Conference Series on Public Policy, 48, 51–94

Charpe, M. Kühn, S. 2012. Bargaining, Aggregate Demand and Employment, *Dynare Working Papers Series*, n.13

Conway, P, Janod, V. and Nicoletti, G. 2005.Product Market Regulation in OECD Countries: 1998 to 2003, *OECD Economics Department Working Papers*, No.419.

Damiani, M., Pompei, F. and Ricci, A. 2011. Temporary job protection and productivity growth in EU economies, MPRA Paper No. 29698

Daudey, E. and García-Peñalosa, C. 2007. The personal and the factor distributions of income in a cross-section of countries, *Journal of Development Studies*, vol. 43, n. 5, 812-829

Delaney, J.T. and Godard, J.T. 2000, Reflections on the "High Performance" Paradigm's Implications for Industrial Relations as a Field, *Industrial and Labor Relations Review,* vol. 53, n. 3, 482-502

De Serres, A. , Scarpetta, S., and De La Maisonneuve, C. 2001. Falling Wage Shares in Europe and the United States: How Important is Aggregation Bias, *Empirica*, vol. 28, n.4, 375–400

Dew-Becker, I. and Gordon, R. J. 2008. The Role of Labor Market Changes in the Slowdown of European Productivity Growth, *NBER Working Papers* 13840, National Bureau of Economic Research

Ellis, L. and Smith, K. 2007. The Global Upward Trend in the Profit Share, *Bank of International Settlements*, Working Paper 231

European Commission. 2004. *Industrial Relations in Europe*, European Commission Directorate General for Employment and Social Affairs Unit D, Brussels

European Commission. 2008. The Labour Income Share in the European Union, *Employment in Europe 2007*, Brussels, European Commission, ch.5, 237-273

European Commission. 2010. *Industrial Relations in Europe 2010*, European Commission Directorate-General for Employment, Social Affairs and Equal Opportunities

European Commission. 2011. *Annual Growth Survey 2012*, Communication from the Commission, Brussels, 23.11.2011

European Commission. 2012, Labour Market Developments in Europe, 2011, Directorate-General for Employment, Social Affairs and Equal Opportunities

Giammarioli, N. et al. 2002. European labour share dynamics: An institutional perspective', *European University Institute Working Paper* ECO n. 2002/13

Glyn, A. (2009), 'Functional Distribution and Inequality', in Salverda, W., Nolan, B. and Smeeding , T. M. (eds.), 101-126

Gollin, D. 2002. Getting Income Shares Right, *Journal of Political Economy*, vol. 110, n. 2, 458-474

Gomme, P. and Greenwood, J. 1995. On the cyclical allocation of risk, *Journal of Economic Dynamics and Control*, vol. 19, n. 1–2, 91–124

Guscina, A. 2006, Effects of Globalization on Labor's Share in National Income, Effects of Globalization on Labor's, *International Monetary Fund*, WP/06/294

Harrison, A. 2002. Has globalization eroded labor's share? Some cross-country evidence, UC Berkeley, mimeo

Hornstein, A., Krusell, P. and Violante, G.L. 2007. Technology-Policy Interaction in Frictional Labor-Markets, *Review of Economic Studies*, vol.74, n. 4, 1089-1124

Ichniowski, C. and Shaw, K. 2003. Beyond Incentive Pay: Insiders' Estimates of the Value of Complementary Human Resource Management Practices, *Journal of Economic Perspectives*, vol. 17, n. 1, 155–180

International Monetary Fund. 2007. The Globalization of labor, *The World Economic Outlook,* Ch. 5 April.

Jaumotte, F. Tytell, I. 2007. How Has The Globalization of Labor Affected the Labor Income Share in Advanced Countries?, International Monetary Fund, WP/07/298

Jayadev, A. 2007. Capital Account Openness' and the Labour Share Income, *Cambridge Journal of Economics*, vol. 31, n.3 , 423-443

Kaldor, N. 1961.Capital Accumulation and Economic Growth, in Lutz, F. A. (ed.), *The Theory of Capital*, London, Macmillan.

Kalecki, M. 1971. *Selected Essays On The Dynamics Of The Capitalist Economy*, Cambridge, Cambridge University Press

Thaler, R. H, and Sendhil Mullainathan, S. 2008, *Behavioral Economics*. The Concise Encyclopedia of Economics. Library of Economics and Liberty.

Kessing, S. G. 2003. A note on the determinants of labour share movements, *Economics Letters*, vol. 81, n.1, 9–12

Laverty. K. J. 1996. Economic "Short-Termism": The Debate, the Unresolved Issues, and the Implications for Management Practice and Research, *The Academy of Management Review*, vol. 21, n.3, 825-860

Layard, R., Nickell, S. and Jackman, R.1991. *Unemployment: Macroeconomic Performance and the Labour Market*, Oxford University Press, Oxford

Manning, A. 1990. Imperfect Competition, Multiple Equilibria and Unemployment Policy, *The Economic Journal*, vol. 100, , n. 400, Conference Papers, 151-162

McDonald, I.M. and Solow, R.M. 1981. Wage Bargaining and Employment, *The American Economic Review*, vol. 71, n.5, 896-908

Michie, J. and Sheehan, M. 2003. Labour market deregulation, "flexibility" and innovation, *Cambridge Journal of Economics*, vol. 27, no.1, 123-143

Michie, J. and Sheehan, M. 2005. Business strategy, human resources, labour market flexibility and competitive advantage, *International Journal of Human Resource Management*, vol. 16, n.3, 445-464

Nickell, S.J. et al. 1994. Wages and Product Market Power, *Economica,* vol. 61, n.244, 457-73

OECD. 1994. *The OECD Jobs Study: facts, analysis, strategies*, Paris.

OECD. 2004. *Employment Outlook*, June, Paris

OECD. 2006. *Employment Outlook*, June, Paris

Oswald, A.J. 1985. The Economic Theory of Trade Unions: an Introductory Survey, *The Scandinavian Journal of Economics*, vol. 87, n.2, 160-193

Rajan, R. and Zingales, L. 1998. Financial dependence and growth, *American Economic Review*, vol. 88, n.3, 559–86

Ricardo, D. 1911. *Principles of Political Economy*, first published 1817, London, Dent.

Rowthorn, R.E. 1999, Unemployment, Wage Bargaining and Capital-Labor Substitution, *Cambridge Journal of Economics*, vol. 23, n.4, 413-425

Salvatori, A. 2012. Union threat and non-union employment: A natural experiment on the use of temporary employment in British firms, *Labour Economics*, vol. 19, n. 6, 944-956

Salverda, W., B. Nolan, B. and Smeeding, T. M. (eds.). 2009a, *Oxford Handbook of Economic Inequality*, Oxford, Oxford University Press

Salverda, W., B. Nolan, B. and Smeeding, T. M. 2009b, Introduction, in Salverda, W., B. Nolan, B. and Smeeding, T. M. (eds.). 2009a, 3-22

Stockhammer, E., Onaran, Ö. and Ederer, S. 2009. Functional income distribution and aggregate demand in the Euro area, *Cambridge Journal of Economics*, vol. 33, n.1, 139-159

van Ark, B., O'Mahony, M. and Timmer M.P.2008. The productivity gap between Europe and the United States: trends and causes, *Journal of Economic Perspectives*, vol. 22, n. 1, 25-44

Venn, D. 2009. Legislation, collective bargaining enforcement: Updating the OECD employment protection indicators, www.oecd.org/els/workingpapers

Visser, J. 2011. Data Base on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts, 1960-2010, Amsterdam Institute for Advanced Labour Studies AIAS, University of Amsterdam

Table 1: Labour share in 14 European economies, 1995-2007

Country	Mean	Coeff. Var.	Min	Max	Variation 2001-1995 (percentage points)	Variation 2007-2002 (percentage points)
AUT	0.494	0.044	0.464	0.532	-0.042	-0.023
BEL	0.494	0.021	0.478	0.510	0.015	-0.027
CZE	0.435	0.016	0.427	0.450	-0.008	0.000
DNK	0.545	0.023	0.525	0.571	0.020	0.020
ESP	0.471	0.021	0.456	0.485	0.021	-0.020
FIN	0.472	0.017	0.461	0.487	-0.017	-0.001
FRA	0.522	0.006	0.516	0.526	-0.002	-0.008
GER	0.534	0.035	0.498	0.556	-0.008	-0.043
HUN	0.469	0.032	0.435	0.486	0.012	0.005
IRL	0.382	0.053	0.352	0.419	-0.047	0.024
ITA	0.380	0.020	0.370	0.390	-0.018	0.016
NLD	0.515	0.020	0.498	0.528	0.011	-0.026
SWE	0.547	0.036	0.509	0.581	0.072	-0.021
UK	0.560	0.028	0.532	0.586	0.039	-0.019

Table 2: Mean and standard deviations of labour shares in 14 European economies

	1995	**2001**	**2007**	**1995**	**2001**	**2007**
Mean	48.93	49.27	48.16	48.93	49.27	48.16
	Panel A			**Panel B**		
	All countries			**All sectors**		
	1995	**2001**	**2007**	**1995**	**2001**	**2007**
Standard Dev.	4.99	6.75	5.81	14.68	13.34	15.88

Table 3: Labour share by sectors, average values in 14 European economies, 1995-2007

	Mean	Coeff. Var.	Min	Max
Agriculture	0.273	0.380	0.126	0.464
Constructions	0.606	0.187	0.418	0.816
Electricity &Gas	0.331	0.290	0.201	0.489
Finance & Real Estate	0.370	0.174	0.249	0.484
Hotels &Restaurants	0.604	0.191	0.439	0.806
Manufacturing	0.591	0.183	0.290	0.717
Mining	0.429	0.539	0.055	0.820
Transports &Communications	0.534	0.173	0.361	0.680
Wholesale &Retail Trade	0.565	0.187	0.315	0.709

Table 4: Employment protection of temporary contracts and labour shares: Diff in diff estimates

Dependent variable: Labour Share								
Explanatory variables	1	2	3	4	5	6	7	8
EPLT * TWS_Bench		0.452**	0.455**	0.462**	0.462**	0.474**	0.521**	0.640***
		(0.216)	(0.216)	(0.216)	(0.216)	(0.218)	(0.210)	(0.201)
EPLT	19.576***	15.667***	2.292	-3.966	377.118	22.842	0.8.22	-13.959
	(1.656)	(2.613)	(7.389)	(7.933)	(334.135)	(377.608)	(7.608)	(9.393)
Capital/output ratio	-1.076***	-0.907**	-0.881**	-0.827**	-0.868**	-0.849**	-1.267***	-0.579
	(0.378)	(0.388)	(0.390)	(0.397)	(0.389)	(0.407)	(0.392)	(0.356)
EPLR * Lay Off_Bench			-0.935**	-1.115***	-0.977**	-1.584***	-1.500***	-1.731***
			(0.422)	(0.426)	(0.429)	(0.467)	(0.444)	(0.431)
EPLR			10.954***	3.648	7.304	5.217	4.076	9.442
			(4.131)	(5.289)	(5.094)	(5.576)	(5.160)	(6.262)
UD * Lay Off_Bench				-0.022*		-0.027*	-0.024**	-0.025**
				(0.011)		(0.153)	(0.011)	(0.010)
UD				0.966**		0.937**	0.777**	0.279
				(0.379)		(0.423)	(0.347)	(0.386)
COV* Lay Off_Bench					-5.658	-0.230		
					(4.992)	(5.623)		
COV					0.017	-0.046		
					(0.018)	(0.055)		
COV*UD*Lay Off_Bench						(0.000)		
						(0.002)		
PMR							0.359***	0.324***
							(0.062)	(0.055)
Employees/Tot.empl.								57.532***
								(3.651)
Country*Time dummies	yes	yes	yes	yes	yes	yes	yes	yes
Sector dummies	yes	yes	yes	yes	yes	yes	yes	yes
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs	1284	1284	1284	1284	1284	1284	1284	1284

Table 5: Differences of LS between Construction and Manufacturing explained by EPLT changes over the period 1995-2007 in three economies

	Labour Share Changes in Construction	Labour Share Changes in Manufacturing	Difference Construction-Manufacturing Changes (1)-(2)	β_1	$\Delta\Lambda_1$	ΔEPLT	$\beta_1*\Delta\Lambda_1*\Delta$EPLT	Proportion (7)/(3)
	1	2	3	4	5	6	7	8
Italy	-0.0034	0.0180	-0.0214	0.0045	1.28	-3.50	-0.0202	0.9400
Belgium	-0.0668	-0.0328	-0.0340	0.0045	1.28	-2.00	-0.0115	0.3383
Netherlands	-0.1078	-0.0402	-0.0676	0.0045	1.28	-1.19	-0.0069	0.1015

Table 6: Employment protection of temporary contracts and compensations- diff in diff estimates

Dependent variable: Ln(Compensation)								
Explanatory variables	1	2	3	4	5	6	7	8
EPLT * TWS_Bench		0.648**	0.665**	0.683**	0.637**	0.641**	0.657**	0.687**
		(0.324)	(0.315)	(0.314)	(0.314)	(0.315)	(0.312)	(0.314)
EPLT	681.07***	575.47***	692.05***	703.65***	-177.17	536.36	701.58***	697.84***
	(3.756)	(4.580)	(14.893)	(15.569)	(756.759)	(824.882)	(15.512)	(15.815)
Capital/output ratio	-6.057***	-5.815***	-5.620***	-5.510***	-5.679***	-5.850***	-5.320***	-5.146***
	(0.759)	(0.752)	(0.754)	(0.759)	(0.753)	(0.763)	(0.794)	(0.799)
EPLR * Lay Off_Bench			-4.325***	-4.746***	-4.158***	-5.624***	-4.580***	-4.638***
			(0.837)	(0.810)	(0.764)	(0.821)	(0.802)	(0.819)
EPLR			7.533	24.921**	15.738	28.801**	24.735**	26.091**
			(8.557)	(11.385)	(11.187)	(12.215)	(11.312)	(11.566)
UD * Lay Off_Bench				-1.538**		-1.664**	-1.456*	-1.582**
				(0.778)		(0.837)	(0.783)	(0.795)
UD				-0.051**		-0.910***	-0.050**	-0.050**
				(0.021)		(0.303)	(0.020)	(0.020)
COV* Lay Off_Bench					-0.068**	-0.327***		
					(0.029)	(0.105)		
COV					13.233	3.742		
					(11.295)	(12.299)		
COV*UD*Lay Off_Bench						0.010***		
						(0.003)		
PMR							-0.155	-0.164
							(0.119)	(0.120)
Employees/Tot.empl.								14.538*
								(8.317)
Country*Time dummies	yes	yes	yes	yes	yes	yes	yes	yes
Sector dummies	yes	yes	yes	yes	yes	yes	yes	yes
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	1284	1284	1284	1284	1284	1284	1284	1284

Table 7: Employment protection of temporary contracts and employment- diff in diff estimates

Dependent variable: Ln(Employment)								
Explanatory variables	1	2	3	4	5	6	7	8
EPLT * TWS_Bench		-1.503**	-1.517**	-1.565**	-1.502**	-1.601**	-1.553**	-1.199**
		(0.642)	(0.642)	(0.642)	(0.646)	(0.652)	(0.645)	(0.594)
EPLT	274.931***	287.926***	288.235***	293.275***	419.935	826.187	294.196***	249.804***
	(5.106)	(7.731)	(24.287)	(25.729)	(1085.858)	(1158.555)	(25.815)	(20.259)
Capital/output ratio	-1.805	-2.368**	-2.520**	-2.853**	-2.487**	-3.164**	-2.938**	-0.87
	(1.162)	(1.202)	(1.205)	(1.224)	(1.209)	(1.266)	(1.222)	(1.085)
EPLR * Lay Off_Bench			3.718**	4.894***	3.631**	4.064*	4.820***	4.128***
			(1.624)	(1.550)	(1.719)	(2.181)	(1.579)	(1.314)
EPLR			-14.484	-13.862	-1.5496	-3.481	-3.779	2.337
			(14.194)	(16.511)	(17.236)	(18.334)	(16.460)	(13.469)
UD * Lay Off_Bench				0.141***		-0.649	0.141***	0.139***
				(0.027)		(0.681)	(0.027)	(0.024)
UD				-1.121		-1.636	-1.157	-2.653**
				(1.123)		(1.201)	(1.126)	(1.036)
COV* Lay Off_Bench					-2.105	-6.779		
					(0.035)	(0.295)		
COV					0.035	-0.295		
					(0.001)	(0.213)		
COV*UD*Lay Off_Bench						0.009		
						(0.700)		
PMR							0.069	-0.038
							(0.241)	(0.201)
Employees/Tot.employment								172.787***
								(12.437)
Country*Time dummies	yes	yes	yes	yes	yes	yes	yes	yes
Sector dummies	yes	yes	yes	yes	yes	yes	yes	yes
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	1284	1284	1284	1284	1284	1284	1284	1284

Table 8: Endogeneity tests, IV estimates with Two steps GMM estimator

Dependent variables	Labour Share		Ln(Employment)		Ln(Wages)	
Explanatory variables						
EPLT *TWSBench	0.475***	0.532***	-1.602***	-1.767***	0.746***	0.879***
	(0.164)	(0.188)	(0.486)	(0.571)	(0.249)	(0.292)
Capital/output ratio	-0.900***	-0.914***	-2.335***	-1.911**	-5.610***	-5.810***
	(0.273)	(0.282)	(0.862)	(0.880)	(0.529)	(0.544)
EPLT	-8.064**		-159.89***		-3.001	
	(3.443)		(12.142)		(9.015)	
Country*Time dummies	yes	yes	yes	yes	yes	Yes
Sector dummies	yes	yes	yes	yes	yes	Yes
Underidentification Test _ p value (Kleibergen-Paap rk LM Statistic)	0.000	0.000	0.000	0.000	0.000	0.000
Weak Identification Test _ Wald F Stat. (Kleibergen-Paap rk Wald F Satistic)	5781.42	712.47	5781.42	712.47	5781.42	387.019
Overidentification Test _ p value (Hansen J Statistic)	0.656	0,984	0.478	0.323	0.098	0.048
Endogeneity test of EPLTxTWSBench_ (p-value)		0,942		0.496		0.258
Endogeneity test of Capital/output ratio (p_value)	0.831		0.331		0.019	
Obs.	1177	1070	1177	1070	1177	1070

APPENDIX

TABLE A1: DESCRIPTION OF VARIABLES

LS	Labour share (sectoral-country data) Source: EU KLEMS database
Comp	Compensation of employees (including wages and salaries and all other costs of employing labour which are borne by the employer) Source: EU KLEMS database
Empl	Number of dependent employees Source: EU KLEMS database
TE	Number of dependent employees and self employed employees Source: EU KLEMS database
EPLT	Employment protection of temporary workers (fixed-term and temporary employment) Source: OECD
EPLR	Employment protection of regular workers against individual dismissal Source: OECD
UD	Union density rates (the share of union members in the employed dependent labour force Source: Visser (2011)
COV	Share of employees covered by wage bargaining agreements Source: Visser (2011)
TWS_BENCH	Share of Temporary Contracts (fixed-term and temporary employment): sectoral-country data. Source: EUROSTAT
LO_BENCH	Lay-off rates: UK Source: Quarterly Labour Force surveys, UK
PMR	Product Market Regulation Source: OECD
CAPITAL TO OUTPUT RAIO *K/Y*	Capital –to output ratio (sectoral-country data) Source: EU KLEMS

Figure 1: Adjusted and non adjusted labour shares in European countries, total industries of the market economy, 1995—2007

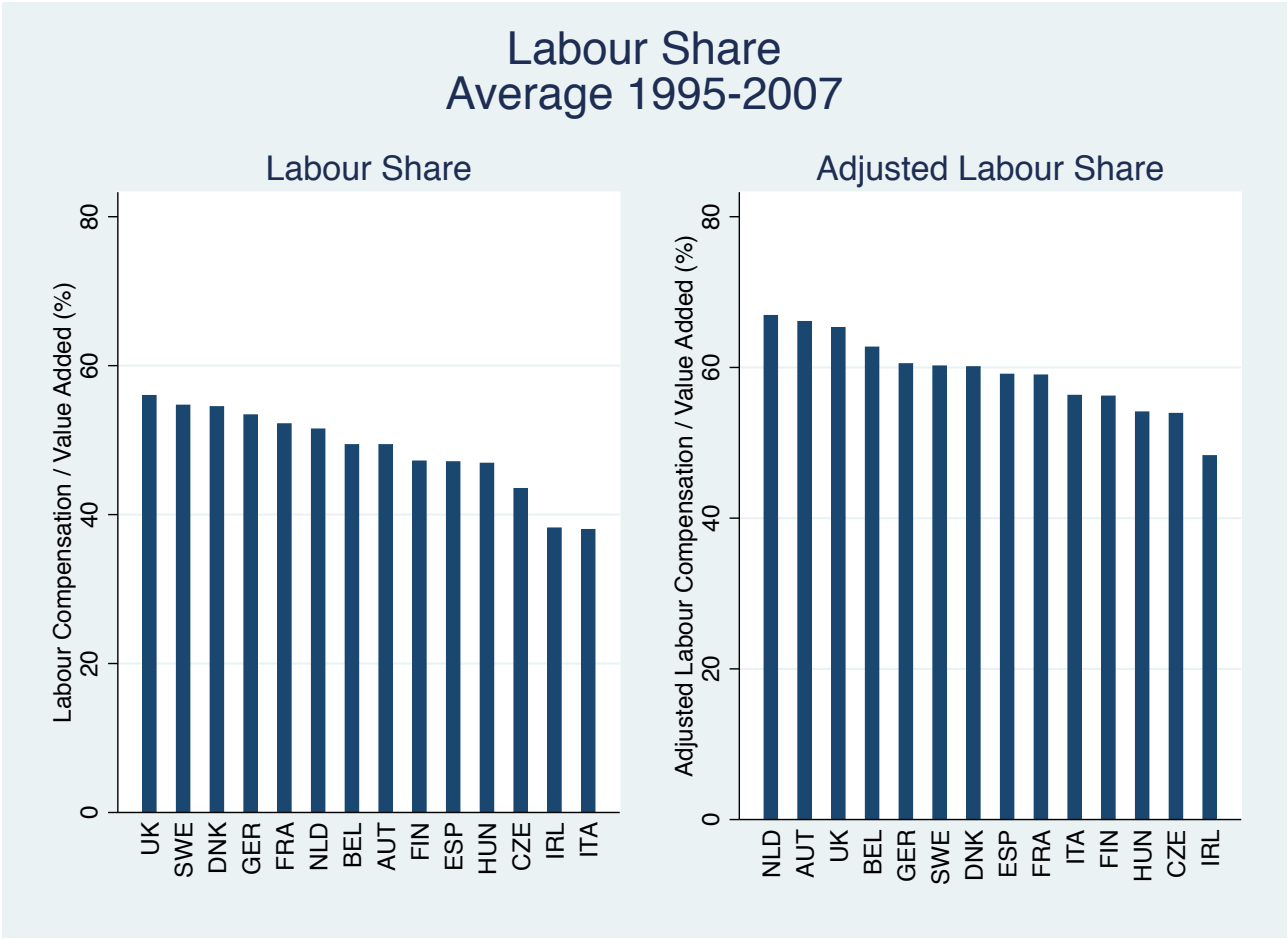

Figure 2: Labour share changes: in 14 EU economies: 1995-2201 and 2002-2007

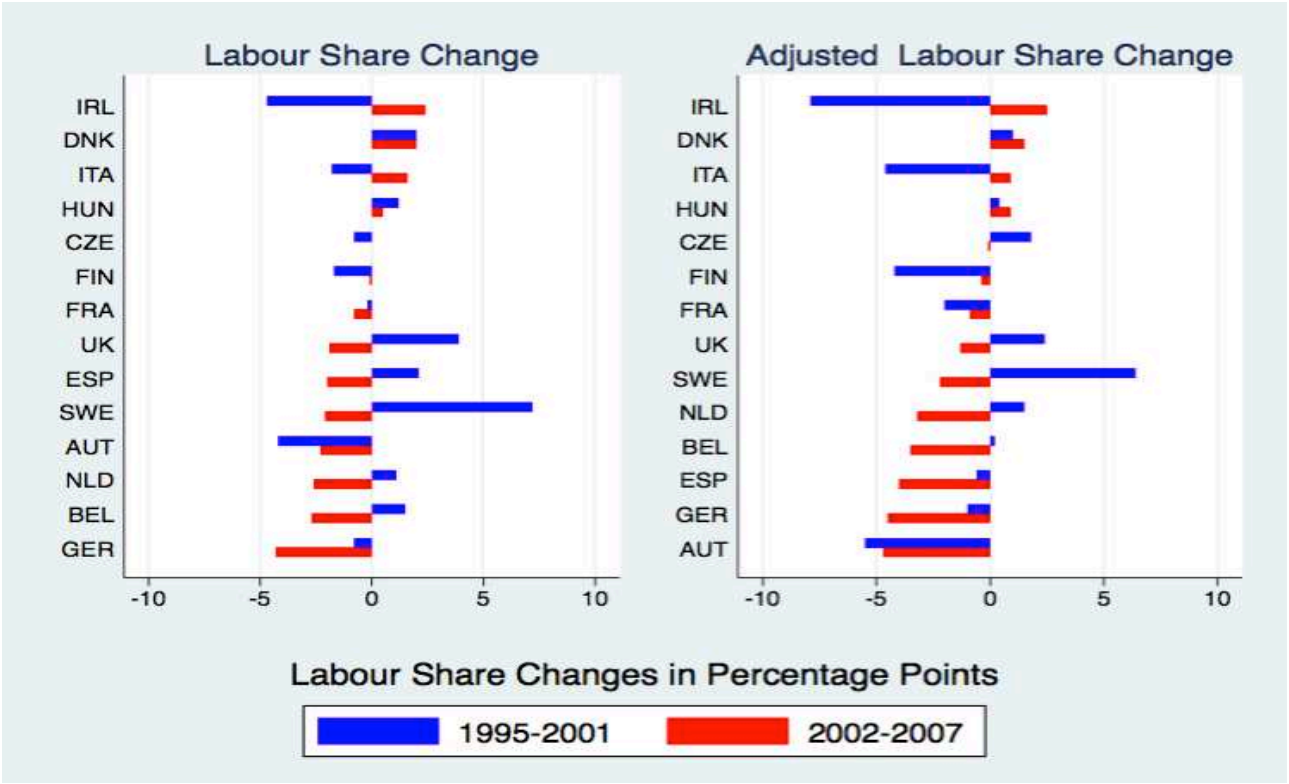

Figure 3: Labour share comparisons by sectors in 14 European economies:: 1995-2007

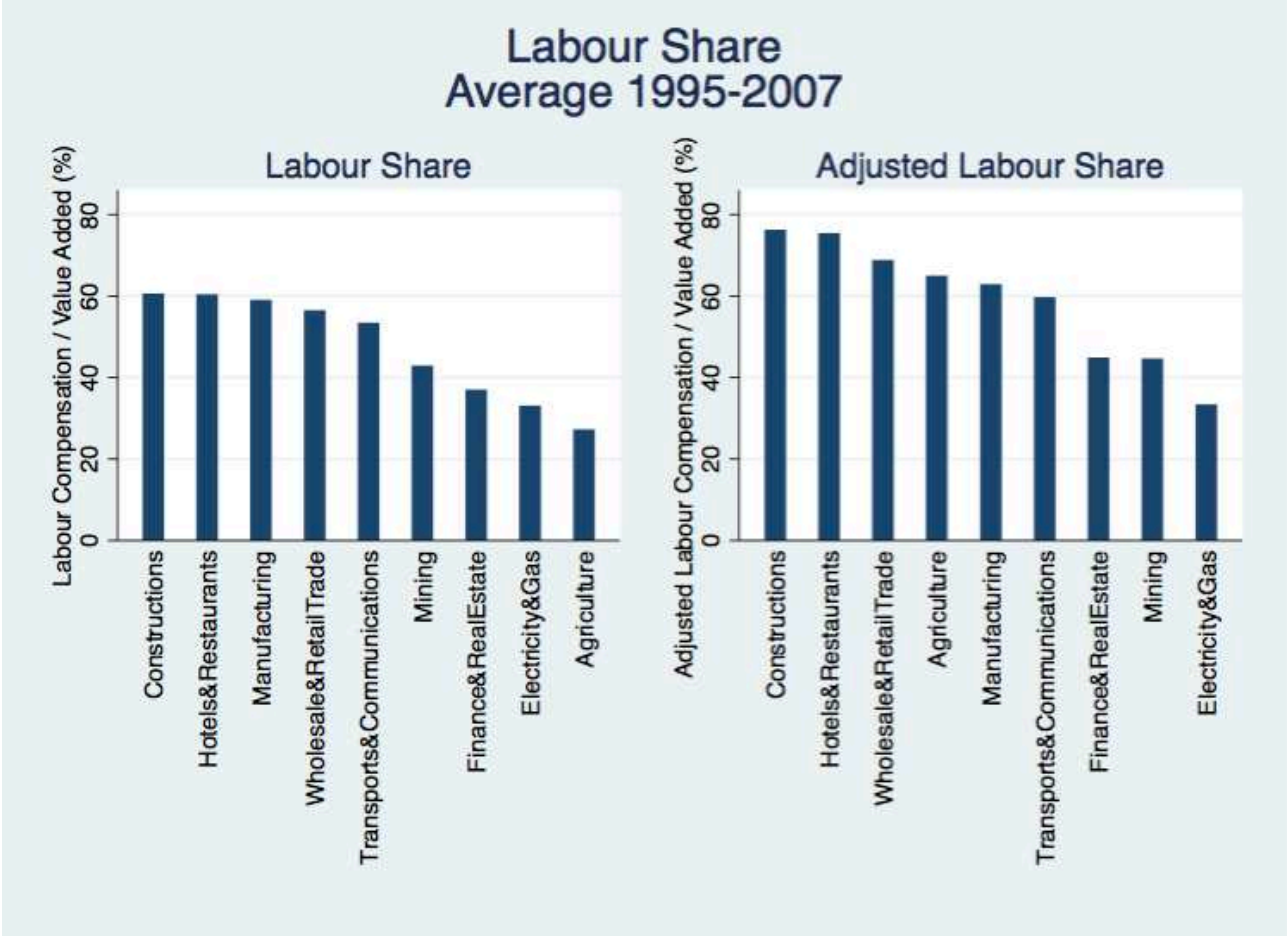

Figure 4: Shift and Share decomposition of labour share changes in 14 European economies

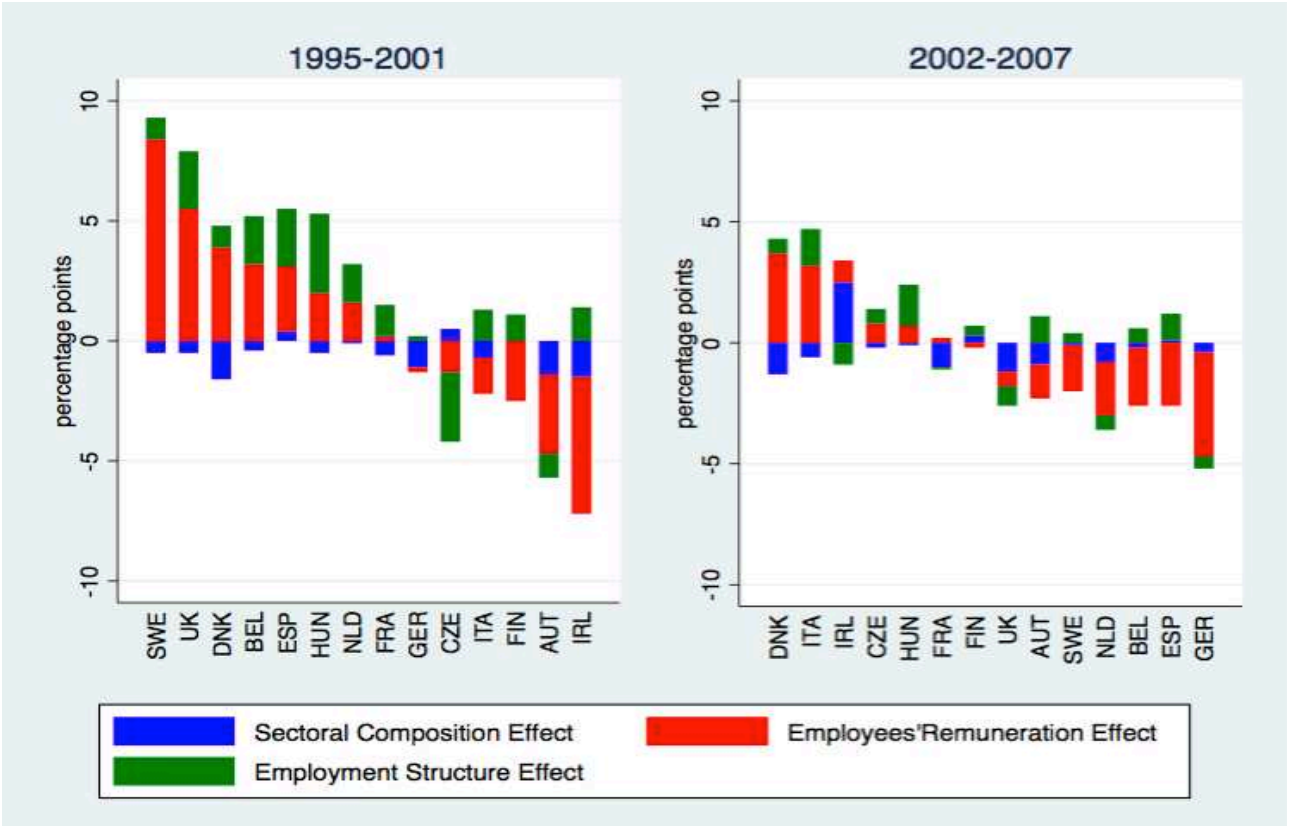

Figure 5: Employment protection of temporary and regular contracts