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Falling Wage Shares:

a Common Trend?¹

Alfonso Arpaia

European Commission Directorate General for Economic and Financial Affairs

Karl Pichelmann

European Commission, Directorate General for Economic and Financial Affairs Institute d'Etudes Européennes, Université Libre de Bruxelles

Abstract

This paper examines the evolution of wage shares over the medium term in a framework where movements in the labour share are driven by the complex interplay of demand and supply conditions for capital and (different skill-categories) of labour, relative factor prices, the nature of technological progress, market structures and institutional settings. It shows that the perception of a relatively widespread downward trend in the wage share is only weakly supported by the data; the absence of a clearly identifiable common pattern across countries and over time suggests that putting all the blame for downward trending wage shares on a global power shift from labour to capital is probably way too simple. Skill-biased technological progress and institutional settings in labour and product markets appear to be the essential determinants of the evolution of wage shares in recent years, together with deliberate wage moderation policies in some countries,

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notably Germany. Overall, our findings suggest that it is perhaps better to look at medium-term wage share movements in terms of country-specific episodes than of global secular trends. We also stress that the evolution of wage shares may not be very informative about how workers actually fare in an era of globalisation and how the benefits of deeper international integration and growth are distributed in our societies.

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"Even if it is sometimes observed that the pattern of distributive shares shows long-run shifts and shortrun fluctuations, the former can be explained away and the latter neglected in principle"

Bob Solow (1958)

1. Introduction

In many countries real wage growth has tended to fall continuously behind productivity increases and profits as a share of GDP have reached their highest level in many decades. Thus, despite Solow's conjecture, in the political debate the share of labour is very much present as a measure of how the benefits of growth are shared between labour and capital and as a general indicator how workers fare in the face of globalisation and structural and institutional changes. It is therefore crucial to understand the determinants of the wage share and its dynamics over time, and how this relates to overall income dispersion; and the present paper sets out to contribute to this task.

Explaining movements in the wage share is challenging, because its dynamic behaviour is driven by a number of complex interacting factors. These factors are likely to differ in their relative importance across countries and across time periods which calls for a careful interpretation of the observed trends in order to get it right with respect to the policy implications. It still appears easy on a secular basis, with a more or less constant share of national income going to labour – properly adjusted for shifts in self-employment – in the (very) long-run being deeply anchored in economists' minds. In the context of the theory of growth and capital accumulation, the long-run constancy of the labour share is associated with models that possess a steady state. Take the well-known Cobb-Douglas production function with its convergence property that characterizes the neoclassical growth model; alternatively, one may adopt the more general Constant-Elasticity-of Substitution (CES) technology coupled with the assumption that all technical progress is labour augmenting. Empirically, the status of "established stylised fact"

attributed to the long-run constancy of the labour share of income is confirmed by the few countries for which this data are available on a secular basis, namely, France, the UK and the USA.

The assertion that oscillations in the labour share at business-cycle frequencies are irrelevant is more questionable. The increasing body of literature focussing on labour share movements in the short run suggests a number of interesting angles to identify the regularities affecting the cyclical behaviour of the labour share, which are informative enough, to conclude that short-run fluctuations in this variable should not be neglected, for example with respect to cyclical stabilisation properties.

The focus of this paper, however, is on the medium run, say periods or episodes that last for a decade or even more. Trend movements and shifts in the wage share over such periods are probably the most relevant for policy makers and the public opinion, yet the most difficult to deal with from a theoretical perspective. Labour share movements over the medium-term may be driven by the transitional dynamics of a neoclassical growth model, which is governed by, inter alia, the degree of substitution between production factors, the process of capital accumulation and the possibly non-neutral effect of technological progress, all of them operating at a time. Moreover, global common trends such as rapidly rising international economic integration are likely to be associated with adjustment processes that are likely to affect wage shares for a considerable period of time. And last but not least, changing institutional structures may lead to shifts in markups and/or workers' bargaining power in imperfectly competitive product and labour markets over the medium run, providing an additional driver of labour share movements. All these determinants are likely to interact with each other in a complex and country-specific dynamic manner.

Against that background the remainder of the paper is organised as follows: Section 2 sketches a basic theoretical framework to think about medium-term movements in the wage share, which is then used to interpret the observed patterns across countries and over time. Section 3 establishes some stylised facts regarding the movement of wage shares over the past couple of decades and shows that the perception of a relatively widespread downward trend in the wage share is only weakly supported by the data, as some notable exceptions are manifest; overall, our findings suggest that it is perhaps better to look at medium-term wage share movements in terms of country-specific episodes than of global secular trends. Section 4 discusses the relation between wage share developments and overall income dispersion pointing out that the former is only a fairly imperfect indicator for the latter. Section 5 concludes.

2. A Simple Framework for Analysis

In standard theory, the share of labour income flowing to wages is a function of relative quantities and prices of the factors of production. If factors are paid according to their marginal productivity, the long-run distribution of total output hinges on the degree to which one input can be substituted with another to equalise marginal gains (i.e. on the elasticity of substitution). For instance, if capital and labour are close substitutes, an increase in the relative price of labour implies a more than proportional fall in employment and a fall in the wage share.

Neoclassical growth theory suggests that for an economy to possess a steady state with constant factor income shares, the production function must be Cobb-Douglas (i.e. the elasticity of substitution equals one) or, more generally, of the CES-type and all technical progress be labour-augmenting. In both cases, any increase in the supply of labour (relative to capital) would be accompanied by a proportional change in its relative price that leaves the factor shares unchanged in the long run, i.e. the steady state. Under Cobb-Douglas the direction of technical change is irrelevant for the factor income distribution. For CES, though, the need for Harrod-neutrality reflects the feature that while capital can be accumulated, labour cannot; thus, labour is the constraining factor, and firms, in order to avoid an explosion of wage share, bias and concentrate technical improvements towards labour.

Over the medium run, i.e., along the transitional dynamics with a CES production function, the labour share will be monotonically decreasing (increasing) in the capital-output ratio if the elasticity of substitution of capital and labour is above (below) one. This is shown in the chart below for the case where the elasticity is high², thus the schedule is downward sloping. Three different drivers of movement in the labour-share can now be distinguished:

² While many empirical studies find an elasticity of substitution between capital and labour of below one (see e.g. Krusell et al. 2000), the elasticity may tend to be higher over the medium- to long-term, in particular for low-skilled workers in the framework of a nested production function where capital and skilled labour are complementary composite factors.

Chart 1: The Labour Share Schedule



Source: Adapted from Bentolila, S. and G. Saint-Paul (1998).

(i) Movements along the curve, caused by shifts in relative factor prices (be they driven by changes in relative factor quantities or labour-augmenting technical progress): In the chart the effect of an increase in wages, ceteris paribus, is shown with the economy moving from point A to A'. Because the elasticity of substitution is high, the negative employment effect of the wage increase dominates the wage effect, the capital-output ration increases and the labour share falls. Vice versa, a reduction in the relative price of labour will actually result in an increase in the wage share. The point to note is that it may be impossible to make a robust inference on wage moderation or, vice versa, on wage push pressure simply from the observation in which direction the labour share moves.

(ii) Secondly, the economy may not only move along the curve, but the curve itself may shift due to the impact of technological and institutional variables. In the example of the chart, the curve shifts downward, for example due to the impact of biased technological progress, i.e. non-labour augmenting, and the economy may settle at point A" exhibiting a lower wage share despite a somewhat lower capital-output ratio.

(iii) And thirdly, there are a number of factors that push the economy off the schedule. These can be thought of as structural and institutional factors that are associated with deviations from marginal cost pricing. Thus, medium-term trends/shifts in mark-ups in imperfectly competitive product and labour markets

will lead to movements in the wage share; more competitive product markets, for example, should be associated with a rising wage share, all else equal.

3. Explaining the Observed Patterns in Wage Share Movements

3.1. Establishing Some Stylised Facts

The measurement of wage shares is beset with several well-known difficulties which can distort comparisons across countries and over time. However, in order to gain a broad picture of the prevailing trends over the past couple of decades, the present paper takes the adjusted wage share series as provided by the European Commission's AMECO database as reference values, where the unadjusted wage share (as a percent of GDP at factor cost) is grossed up in line with the share of self-employment in total employment; note that when available full-time equivalents are used in the calculation (see box 1 for the definitions).

Adjusted wage shares for the EU-15 and the US are shown in chart 2. The picture shows the rising wage share in Europe in the late 1960s and early 1970s followed by the protracted reduction throughout most of the 1980s; in the US, in contrast, the wage share had remained broadly constant in this period. Since the late 1980s both series exhibit a mild downward trend with some cyclical variations, approaching a value of about 65% at the end of the observation period in 2007. The similarity in terms of trends and absolute levels may seem remarkable from the perspective of the different labour compacts and "social models"; but it appears less surprising in view of broadly similar production technologies (as reflected in roughly equal values of productivity per hour worked) and a common exposure to global trends.

Chart 2: Adjusted Wage Shares in the EU-15 and the USA



Source: Eurostat.

Chart 3 shows the evolution of adjusted wage shares in the four major economies of the euro area. All four countries experienced a marked fall in the wage share from the early/mid 1980s on, overcorrecting any increase of earlier years. A cyclical hump in the late 1980s/early 1990s is visible in the series for Germany, Italy and Spain. As regards more recent developments, no apparent correlation with the euro shows up in the data: since the introduction of the euro, the wage share has declined significantly in Germany and in Spain, while it has remained broadly constant in France and in Italy. In Germany, in particular, deliberate wage moderation policies, coupled with a protracted weak employment response, appear to have played a major role in recent years.

Chart 3: Adjusted Wage Shares in the Major Euro Area Economies



Source: Eurostat.

Box 1: Adjusted wage share; total economy (AMECO Database)

(% GDP at current factor cost)

	$= [(UWCD : NWTD) : (UYGD : NETD)] \times 100$ or
	$= [(UWCD : FWTD) : (UYGD : FETD)] \times 100$
UWCD =	Compensation of employees; total economy
	Sector affected: Total economy (S 1)
	Definition (ESA 95): 4.02 f
	Source: National accounts; Eurostat or National
NWTD =	Employees, persons; all domestic industries (National accounts) No ESA 95-code
	Sector affected: Total economy (S.1)
	Definition (ESA 95): 11.12 - 11.14
	Source: National accounts; National, OECD or Eurostat
UYGD =	Gross domestic product at current factor cost-
	Source: AMECO
NETD =	Employment, persons; all domestic industries (National accounts)
	NO ESA 95-COde Sector affected: Total economy (S 1)
	Definition (FSA 95): 11 11 f
	Source: National accounts; National, OECD or Eurostat
	Where available- full-time equivalents are used-:
FWTD =	Employees, full-time equivalents; total economy (National accounts)
	Sector affected: Total economy (S 1)
	Definition (ESA 95):
	- Employees: 11.12 - 11.14
	- Full-time equivalence: 11.32
	Source: National accounts; -Eurostat or National
FETD =	Employment, full-time equivalents; total economy (National accounts) No ESA 95-code
	Sector affected: Total economy (S.1)
	Definition (ESA 95):
	- Employment: 11.11 f

Chart 4 depicts the evolution of adjusted wage shares for a couple of EU countries both within and outside the euro area. Belgium, the Netherlands and to some extent Denmark again show a medium-term swing of the wage share in the 1970s and 1980s; and the series for the UK and Sweden exhibits relatively sharp cyclical movements. But the most notable common pattern between these countries is the absence of any clearly visible trend in the wage share over the past 15 years clearly challenging the simple view of a uniform trend caused by a common global trend.



Chart 4: Adjusted Wage Shares in Selected EU Economies

Source: Eurostat.

3.2. Interpreting Movements in the Wage Share

The sketched framework can be nicely exploited to interpret movements in the wage share over the past couple of decades. Early models have tried to explain changes in the wage share in terms of underlying changes in relative factor prices, which proved useful to account for labour share movements in the 1970s. An increase in relative wages starting in the 1970s led initially to an increase in the labour share and not much effect on employment. As firms started substituting away from labour, the labour share started to fall, and unemployment to rise. Even so, it is argued that the decrease in the labour share since the mid 1980s has not been associated with a consistent increase in employment and it seems unlikely that this evolution can be solely explained by long lags or by the costs of adjusting factor proportions.

A second set of contributions has analysed variations in the labour share in the framework of rent-sharing models: product market imperfections generate rents

that are split between firms and unions. In this perspective, downward movements in the labour share derive from a rise of rents accruing to firms owing to rising imperfection in the goods markets, which raises the price level and eventually reduces real wages, or to weaker unions' bargaining power. This framework incorporates the effect on the labour share induced by product market regulation, which set the entry costs and the degree of competition between firms, and that of labour market regulations, which influence the unions' bargaining power.

In Blanchard and Giavazzi (2003), labour market deregulation is held responsible for the decline in the labour share in continental Europe. Yet, this decline is seen as temporary; in the long-run enhanced product market deregulation should spur employment and the labour share should recover. However, increasing competition is likely to induce firms to adopt more flexible workplace organisation schemes, and these practices may well be biased against low-skilled workers.

Indeed, much in the same way as in the literature on the determinants of income inequality, a large amount of empirical studies have sought to link movements of the labour share to skill-biased technological progress and to globalisation. If technical progress is capital-augmenting, the marginal productivity of capital rises, pushing up the returns to capital and lowering the share of wages for any given capital-output ration. Ellis and Smith (2007) claim that by increasing the rate of obsolescence of capital goods the ongoing technological progress has put firms in a stronger bargaining position relative to a labour force that now faces more frequent job losses on average. This effect is stronger where labour market institutions are more rigid.

There are several reasons why globalisation may adversely impact on the labour share (e.g. Rodrik, 1997; Harrison, 2002). As the economy becomes more open to trade, capital-rich countries specialise in the production of capital-intensive goods and import labour-intensive goods. Accordingly, the returns to labour and the labour share will decline in the developed countries, especially for the relatively scarce but globally abundant unskilled labour.³ Globalisation also makes capital more mobile, putting pressure on labour, the less mobile factor. Finally, some have argued that globalization pressures might have pushed industrial countries to adopt labour-saving technologies, further squeezing the labour share. European Commission (2007) and IMF (2007) showed that globalization may have reduced the share of income accruing to labour in advanced economies, but the effect is found to be small. Note in this context that as shown in the previous section wage shares started to fall in the mid-1980s, partly as a reaction to the rise in the late 1960s and throughout most of 1970s, but in any case well before the entry of

³ In terms of welfare, however, workers in advanced economies could still be better off if the positive effects from enhanced trade and productivity on the economy's income (the size of the total 'pie') are larger than the negative effect on the share of this income that accrues to labour.

China, Eastern Europe, India and other countries into the global market economy. Moreover, it is not evident that the capital-labour ratio is actually lower in these countries once labour is measured in efficiency units; and if it really were abundant global labour causing the fall in wage shares, then the relative price of investment goods should have risen, but actually the opposite has been the case. These arguments, together with the variety in experiences across countries and over time, indicate that putting all the blame for downward trending wage shares on a global power shift from labour to capital is probably way too simple.

Indeed, the largest contribution to the fall in the aggregate labour share appears to stem from skill biased technological progress (European Commission, 2007). The IMF analysis also finds that countries that have enacted reforms to lower the cost of labour to business and improve labour market flexibility have experienced a smaller decline in the labour share, though it may be difficult to generalise this result. Some country-specific episodes, such as the recent German experience, appear to relate downward pressure on wage shares more directly to a weaker hand of labour in the bargain. In summary, the discussion in this section suggests that movements in the labour share are driven by the complex interplay of demand and supply conditions for capital and (different skill-categories) of labour, relative factor prices, the nature of technological progress, market structures and institutional settings. Thus, wage policies alone will not be able to reverse the downward trend in labour shares observed in many countries.

4. Wage Share Movements and Income Dispersion

The wage share is not a very good policy indicator in many respects. As argued previously, wage share movements may carry little information content about underlying wage pressures and wage bargaining power. But perhaps even more importantly, they may not be very informative about how workers actually fare in an era of globalisation and how the benefits of deeper international integration and growth are distributed in our societies. In particular, developments in the wage share may bear little relationship to earnings inequalities as the example of the UK demonstrates where the wage share has been broadly constant, but earnings inequality has been high and rising.

Checchi and García-Peñalosa (2008) present a unifying framework to analyse the developments in income inequality and its relationship with the dispersion of wages and the labour share. Income inequality is measured by the Gini-Index computed across four groups of population, namely unemployed, unskilled, skilled workers and skilled people earning both incomes from labour and from capital. Inequality depends on the population proportions, the replacement rate, the wage dispersion and the labour share. All other things being equal, a higher rate of unemployment will raise income inequality, as the fraction of individuals with low incomes will increase. A more dispersed wage distribution raises the Ginicoefficient as it increases inequality between different groups of employed individuals (e.g. skilled and unskilled).

More ambiguous is the effect of the wage share. On the one hand a higher labour share implies lower inequality between capital- and non-capital owners; but on the other hand, a higher labour share increases the income differential between employed and unemployed individuals, raising the inequality within the group of non-capital owners. However, the available evidence suggests that the effect of inequality between capital owners and non-capital owners is more important than the inequality within groups (employed versus unemployed workers). Thus, a lower labour share tends to raise income inequality.

It is an empirical question how the developments in the unemployment rate, the wage differential and the labour share can account for the income inequality patterns observed over the past decades in euro-area countries. During the last decade euro-area countries experienced a gradual reduction in their unemployment rates, which may have partially offset the increase in income inequality caused by a falling labour share (in many euro-area countries) and an increasing wage dispersion (in some of them). The fact that in some countries the reduction in the labour share has been pronounced while the increase in income inequality measured in terms of disposable income has been much less so further suggests that redistribution through taxes and transfers had a strong equalising effect.

5. Concluding Remarks

Movements in the labour share are driven by the complex interplay of demand and supply conditions for capital and (different skill-categories) of labour, relative factor prices, the nature of technological progress, market structures and institutional settings. All these determinants are likely to interact with each other in a complex and country-specific dynamic manner. Against that background, it is perhaps not surprising that the hypothesis of a relatively widespread downward trend in wage shares is only weakly supported by the data; the absence of a clearly identifiable common pattern across countries and over time suggests that putting all the blame for downward trending wage shares on a global power shift from labour to capital is probably way too simple. Skill-biased technological progress and institutional settings in labour and product markets appear to be the essential determinants of the evolution of wage shares in recent years, together with deliberate wage moderation policies in some countries, notably Germany. Overall, our findings suggest that it is perhaps better to look at medium-term wage share movements in terms of country-specific episodes than of global secular trends.

It should also be stressed that the wage share is a relatively poor indicator variable in many respects, and it is certainly no direct policy variable at all. To begin with, movements in the wage share are a far from perfect indicator for underlying wage pressures in the economy. And they tell little about earnings inequalities and distributional fairness in our societies. Income inequality rose sharply in the UK in the 1980s and in the US in the 1980s and 1990s and still continuing, while wage shares remained relatively stable. Again, national experiences vary over the last decades and there is no single overarching common story. While income dispersion has apparently increased moderately in the Nordic countries, Austria and Germany, inequality did not show any persistent tendency to rise in the Netherlands, France and Italy. These diverse developments provide clear evidence for the importance of country-specific events and policies.

In the end, coming back to the quote from Bob Solow at the beginning, the reader is reminded that it stems from an article with the telling title "A Skeptical Note on the Constancy of Relative Shares". Actually, Solow himself already points to the importance of "a whole string of intermediate variables: elasticities of substitution, commodity demand and factor supply conditions, markets of different degrees of competitiveness and monopoly, far from neutral taxes" and so on, calling in question whether a look at this complicating forces leads to "an expectation of "relative stability" if anything". In fact, over the medium-run movements in the wage share and its complex interaction with income inequality appear way too important to be safely ignored.

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