



Focus

II. Income inequality and wage share: Patterns and determinants.

This focus section describes long-run patterns in income inequality and labour income shares and discusses the determinants of distribution of income as well as their relationship with wage inequality and the unemployment rate. Income inequality in advanced economies followed a common downward trend until the 1970s and has tended to increase since, although with varying patterns across countries in terms of both magnitude and timing. This lack of a common pattern does not hold for top incomes, whose share has increased in almost all countries. Empirical evidence suggests that global trends, such as skill-biased technological progress, may have played a role in driving inequality over time, particularly regarding top incomes. However, the fact that wage and income inequality have shown marked country-specific patterns in recent years indicates that explanations based on common shocks can only account for part of the recent trends observed. In addition, changes in labour market institutions and in redistributive policies (through taxes and benefits) as well as their interaction with common shocks seem to have played a major role. This focus section also discusses developments in the wage share and warns against interpreting changes in wages as changes in income inequality. The relationship between income inequality and the wage share is complex. For instance, a fall in the labour income share may not be accompanied by a significant increase in income inequality if it comes with a lower unemployment rate, a less dispersed wage distribution and is offset by redistributive policies. There is some indication that, in some euro-area countries, the reduction in the labour share over the past two decades has been more pronounced than the increase in the inequality of disposable incomes.

Concern about rising income inequality in many advanced economies over the last two decades has triggered extensive research on the patterns and causes of income inequality. This article intends to contribute to the debate by reviewing developments in the main inequality concepts and the likely drivers of the changes observed in the distribution of income. Particular attention is paid to the wage share – a concept widely followed in the policy debate – and its relation with other measures of income inequality.

1. Income inequality patterns

Inequality patterns across countries

This section presents a cross-national comparison of income inequality indicators (see Box 4).⁴⁰ Graph 27 illustrates an unambiguous pattern of income inequality in the euro area.⁴¹ Southern European countries and Ireland show

the highest levels of inequality, Finland the lowest; continental euro-area countries are between the two.⁴²

Graph 28 compares Gini indices on market income (i.e. before taxes and benefits) and disposable incomes, the difference showing the impact of monetary redistribution through taxes and benefits. Several findings are noteworthy. First, disposable incomes are more evenly distributed than market incomes, as taxes and benefits narrow the overall distribution. Second, cross-country variation in inequality is wider after redistribution, as not all euro-area countries are equally successful in reducing market inequality. Third, nations that redistribute the most are not necessarily those with the greatest degree of market income inequality; the reduction in the Gini index due to redistribution is at its highest in Finland and Austria and at its lowest in Portugal and Italy. This picture does not change when the sample is extended to the EU-15, with Nordic and southern Mediterranean countries at the two extremes of the ranking. Fourth, the reductions are consistent with the patterns of aggregated public expenditure. However, large

⁴⁰ Figures are from the *Luxembourg Income Study* (LIS), which provides an internationally comparable dataset on household incomes, their demographic characteristics and the labour market status of the main earners.

⁴¹ Countries are separated into high- and middle-income economies according to per-capita gross national income in 2004. Middle-income economies are those with a gross national income of more than \$826 but less than \$10065; high-income economies are those with a gross national income of \$10066 or more.

⁴² This basic pattern is confirmed by the analysis of *Lorenz dominance*. The decile ratio leads to different orders, but the differences are small. See Brandolini, A. and T.M. Smeeding (2007), 'Inequality patterns in Western-type democracies: Cross-country differences and time changes,' *CHILD*, WP No 08/2007.

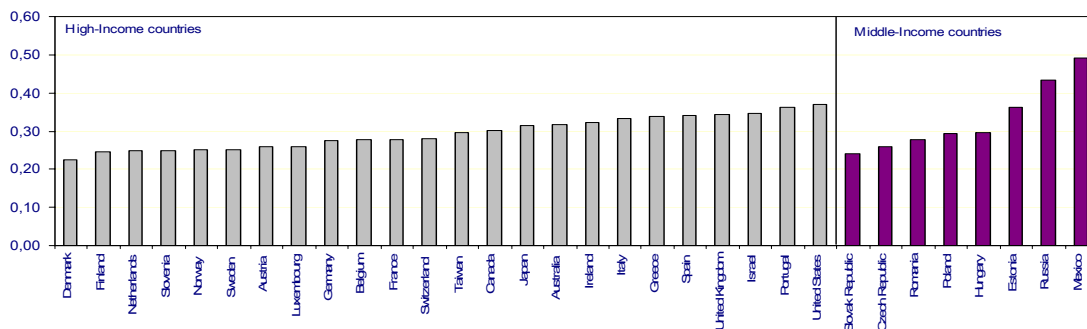
dispersion along the curve indicates that there are probably large country differences in the effectiveness of spending in correcting inequality (Graph 29).

The impact of government action on income distribution may be direct or indirect. The level of taxation and its progressivity is the most direct factor. The tax system influences the retirement age and individual effort, with direct impact on income distribution. Tax policies subsidising education, health and training will indirectly have some impact over time on income distribution.

Inequality dynamics, over the life cycle of individuals and from an intergenerational perspective, are crucial. This is why education and health systems are such important factors when it comes to fighting persistent inequalities. On the expenditure side, any support for poorer individuals, including benefits in kind, has a direct effect on income distribution. Indirect effects may operate through means that improve job opportunities for the less well-off (e.g. education or on the job training), keep people healthy and improve their chances of being in the labour force.

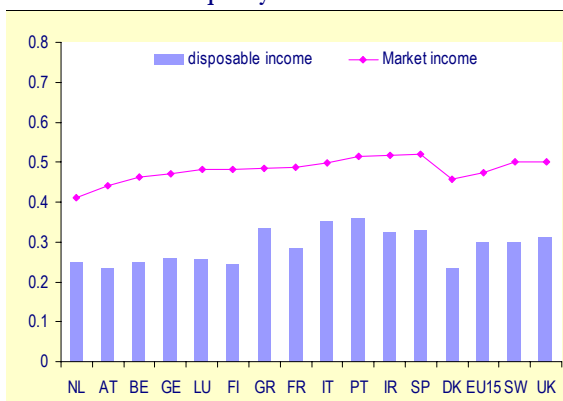
Graph 27: Income inequality: Gini Index on household-equivalent disposable income

Most recent data for each country, late 1990s/early 2000s



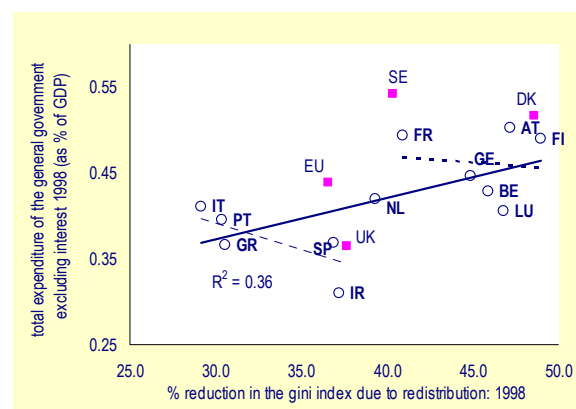
Data source: Brandolini and Smeeding (2007). Authors' calculations from the Luxembourg Income Study database.

Graph 28: Impact of public redistribution on income inequality: Gini Indices



Source: Immervoll, G., H. Levy, C. Lietz, D. Manotvani, C. O'Donoghue, H. Sutherland and G. Verbist, (2005), 'Household Incomes and Redistribution in the European Union: Quantifying the Equalising Properties of Taxes and Benefits', *IZA Discussion Papers* 1824. Gini indices are computed on the basis of micro-simulations of income levels rather than on records of original micro-data as in Brandolini and Smeeding (used in Graph 29).

Graph 29: Public redistribution and public expenditure: 1998



Source: Immervoll et al (2005).



Box 4: Measures of income inequality

A widely used indicator is the *income share per decile*, with the share of the poorest (10th percentile) and the richest decile (90th percentile) capturing inequality at the top and at the bottom of the income distribution. The *decile ratio*, $P90/P10$, equals one in the case of perfect equality and tends to infinity as less income accrues to the bottom 10th of the population, and more to the top 10th. The top percentile income share divided by the income share of the next nine percentiles in the top decile gives a picture of the inequality at the very top of the distribution.

The *Lorenz curve* describes the *entire income distribution*, plotting the income share of the bottom x percent of the population against the population share. The *Gini index* is the ratio of the area under the Lorenz curve and the area under the perfect equality line (i.e. the total triangle below the 45-degree line). Accordingly, it varies between 0 (maximum equality) and 1 (maximum inequality).

The *ranking of countries* depends on which part of the distribution is analysed. Thus, different measures may lead to different rankings, as they weight the top and the bottom of the distribution differently. For example, the Gini index gives less weight to the very rich and the very poor. Accordingly, it is less sensitive to measurement problems at the extremes of the income distribution. However, its biggest problem is that different distributions can lead to the same value of the index. A robust ranking is provided by comparing the *Lorenz curve* across countries. Thus, income is distributed less unequally in country A than in country B if the Lorenz curve of A always lies above, i.e. it "*Lorenz*" dominates that of B .

Money income can refer to market, gross (or total) or disposable income. Market income comprises labour, capital income or self-employment income. Gross income adds to market income all transfers received by the household, such as unemployment compensation, welfare benefits, public and private pensions, child and family allowances. Disposable income is equal to gross income minus direct income taxes and social security contributions.

Indicators can look at household, household equivalent and person. In order to account for the economies of scale stemming from cohabitation, household equivalent measures are preferable. Changes in the labour market status of family composition may influence income inequality even without changes in individual wages. For example, Esping-Andersen (2004)* argues that most of the rising trend in household income inequality is due to the increase in female participation and to the reduction in youth participation.

*Esping-Andersen, G (2004), 'Income distribution and life chance opportunities', in A. Giddens (ed.), *The New egalitarianism: opportunity and prosperity in modern society*'.

Time changes in income inequality

Analysis of inequality is fraught with data problems, which make cross-country comparison of changes over time difficult. Even so, empirical evidence has generated a number of stylised facts (Graph 33). First, from a secular perspective, the common decline in inequality in the earlier part of the 20th century ceased in the 1970s. Second, in many countries the increase in inequality over the past three decades has been larger in terms of market income. Inequality in terms of market income displays a rather uniform picture across countries, increasing in the 1980s and early 1990s, but very stable afterwards (Brandolini and Smeeding, 2007). Inequality of disposable income decreased until the mid-1970s, followed by a more country-specific pattern thereafter. It rose sharply in the United Kingdom in the 1980s and in the United States in the 1980s and 1990s, and more modestly in Finland, West Germany, Sweden and Canada in the 1990s. By contrast, it

stabilised during the 1990s in the Netherlands, France and Italy.⁴³ The different behaviour of income inequality in terms of market and disposable incomes reflects the equalising effect of redistributive policies.

The lack of an international common pattern in overall income inequality does not concern the upper tail of the distribution. Graph 30 displays the income shares earned by the richest.⁴⁴ Apart from clearly showing the impact of the

⁴³ Estimates based on Survey of Household Income and Wealth show that the inequality of disposable income rose sharply in Italy between 1991 and 1993 but not thereafter, which is surprising given the fundamental transformation that occurred in the labour market. See Boeri, T. and A. Brandolini (2005) 'The age of discontent: Italian households at the beginning of the decade', *Giornale degli Economisti e Annali di Economia*, Vol.63 (3-4), pp. 449-487.

⁴⁴ These series are constructed by several researchers as parts of a joint effort where the main source is the income statements in personal tax returns collected for different income classes (Roine *et al.*, 2007).

depression and World War II for many countries, a striking feature is the remarkably similar development of top income shares across countries over time. In times when a country has grown faster than the average, top income earners have benefited more than proportionally (Piketty, 2003; Atkinson and Piketty, 2007).⁴⁵ This result does not depend on the stage of development and is consistent across countries.

Besides income inequality, there has been much concern about rising wage inequality. OECD (2007a)⁴⁶ decomposes the overall change in wage inequality in 10 OECD countries since 1980 into the contributions of wage dispersion in the upper and lower halves of the wage distribution. With the exception of France and Finland, wage inequality has increased since the 1980s, with most of the increase stemming from increased inequality in the top half of the wage distribution.

2. Determinants of income inequality

An important distinction should be made between the drivers of overall inequality and those at the upper tail of the distribution.

Determinants of overall income inequality

The Kuznets hypothesis contends that income inequality widens at the early phase of economic growth and narrows in the later stages of development. As an economy goes through structural change (i.e. resources are transferred from low- to high-productivity sectors), inequality follows an inverse U-shape. Recent work has considered variables other than the level of income, such as the degree of democratisation and financial development, or the extent of dualism in the labour markets.

⁴⁵ Piketty, T. (2003) 'Income inequality in France, 1901-1998', *Journal of Political Economy*, Vol. 111, No 5, pp. 1004-1042

Atkinson, T. and T. Piketty, (2007), 'Top incomes over the Twentieth Century: a contrast between continental European and English-speaking countries', *Oxford University Press*.

⁴⁶ OECD (2007a), 'OECD Workers in the Global Economy: Increasingly Vulnerable', *OECD Employment Outlook*, 2007.

Political scientists (e.g. Reuveny and Li, 2003)⁴⁷ advance the idea that democracy promotes egalitarianism, due to its use of redistributive policies. As regards the impact of financial development, theory predicts that it should decrease inequality, as it facilitates access to capital of previously credit-constrained individuals (e.g. Galor and Zeira, 1993).⁴⁸ The empirical evidence shows that more democratic countries, better law enforcement, and greater financial development are associated with a more equal distribution of income while segmented labour markets are associated with greater inequality (e.g. Barro, 2000, Bourguignon and Morrison, 1998).⁴⁹

Determinants of overall income inequality in small samples of mature economies

Economic structure, political variables and the level of financial development show little variability across OECD countries, and are thus ineffective in explaining inequality in developed economies. A first strand of the literature has explored the relationship between inequality and growth (e.g. Aghion *et al.*, 1999; Bertola *et al.*, 2006; García-Peñalosa, 2007).⁵⁰

This literature argues that the growth process is the result of a combination of technological change, accumulation of physical and human capital and changes in labour supply, each of them representing a channel through which inequality and growth are related. However, the

⁴⁷ Reuveny, R. and Q. Li (2003), 'Economic openness, democracy and income inequality: and empirical analysis', *Comparative Political Studies* 36 (5), 575-601.

⁴⁸ Galor, O. and J. Zeira (1993), 'Income Distribution and Macroeconomics', *Review of Economic Studies*, 60, 35-52.

⁴⁹ Barro, R.J. (2000), 'Inequality and growth in a panel of countries', *Journal of Economic Growth*, Vol. 5, pp. 5-32.

Bourguignon, F. and C. Morrison (1998), 'Inequality and development: The role of dualism', *Journal of Development Economics*, Vol. 57, pp. 233-257.

⁵⁰ Aghion, P., E. Caroli and C. García-Peñalosa (1999), 'Inequality and growth in the new growth theories', *Journal of Economic Literature*, Vol. 37, pp. 1615-1669.

Bertola, G, R. Foellmi, and J. Zweimüller (2006). 'Income distribution in macroeconomic models', *Princeton University Press*, Princeton.

García-Peñalosa, C. (2007), 'The economics of distribution and growth. Recent issues', *mimeo*, 4th annual DG ECFIN research conference.



outcome of this literature is that 'anything goes': distribution can widen or narrow during the growth process and growth of itself cannot be expected to reduce inequality of incomes.

The poor predictive capacity of growth theory has prompted vast research to shed light on inequality patterns within rich countries. The literature has focused on the effect of skill-biased technological change (SBTC), globalisation, labour market institutions (LMIs) and economic integration.

Technological developments have increased the relative demand for skilled workers, pushing up their wage relative to that of unskilled workers, thereby worsening the distribution of wage earnings and increasing income inequality. However, the difference across countries in the patterns of wage inequality is inconsistent with a single explanatory factor. In particular, LMIs may have brought about bigger changes in the wage premium of high-skill workers than were warranted by changes in supply and demand. For instance, the decline of the unions and the erosion of the real value of the minimum wage in the US in the 1980s may have increased the wage premium by more than was justified by market factors alone.

Theory has yielded a number of predictions about the effects of globalisation on inequality, with various channels, including trade, offshoring of intermediate inputs, immigration and the transformation of the welfare state. The neo-classical trade theory predicts that countries relatively more endowed with capital and skilled labour should specialise in capital and skill-intensive products. In addition, low-skilled labour can be accessed by advanced economies by off-shoring of intermediate inputs and through immigration. Hence, the wages of the low-skilled come under pressure as countries specialise and the distribution of earnings in developed countries worsens. However, it is not obvious why such globalisation forces should cause an increased dispersion in the upper half of the wage distribution, as discussed in the previous section.

On the relationship between globalisation and the welfare state there are two competing perspectives. The first is that globalisation

increases capital mobility and shifts taxes on labour, thereby weakening the capacity of the State to redistribute (e.g. Tanzi, 1995; Blank and Freeman, 1994).⁵¹ An opposing view contends that social policies respond in ways that minimise the adverse consequences of globalisation for vulnerable workers (e.g. Rodrik 1998).⁵²

The evidence on the effect of globalisation on inequality is inconclusive. On the one hand, heightened import competition and increased offshoring had little (if any) effect on aggregate employment; on the other hand, it reduced the demand for low-skilled relative to high-skilled workers, thereby increasing wage dispersion. However, it is difficult to disentangle the effects of globalisation from other factors, such as structural reforms and technological change. The immigration literature shows negligible impact of increased immigration on domestic workers, but rather a big downward impact on foreign-born workers who specialise in particular occupations dominated by immigrants.⁵³

However, it is hard to explain the changes in inequality only on the basis of common factors. The lack of common developments in inequality in recent years suggests that country-specific features such as changes in LMIs more than common trends play a role in driving inequality over time (e.g. for the US, Levy and Temin, 2007; for Europe, Checchi and García-Peñalosa 2008).⁵⁴

⁵¹ Tanzi, V. (1995), 'Taxation in an Integrating World', Brookings Institution, Washington, DC.

Blank, R.M. and R.B. Freeman (1994), 'Evaluating the connection between social protection and economic flexibility', in R. M. Blank, ed., *'Social Protection versus Economic Flexibility'*, The University of Chicago Press.

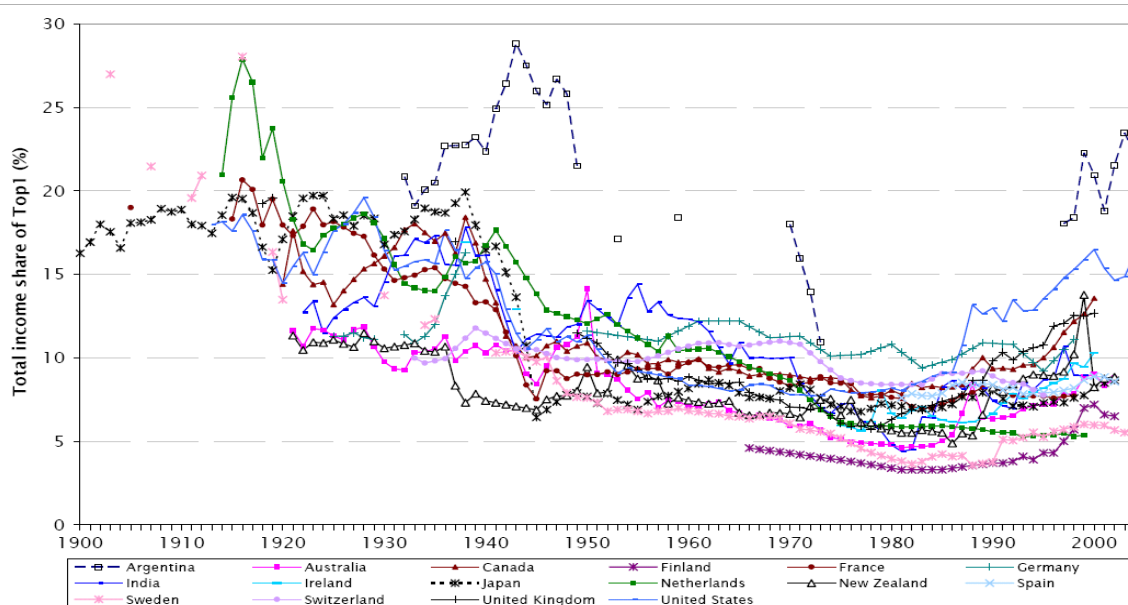
⁵² Rodrik, D. (1998), 'Why do more open economies have bigger governments?', *Journal of Political Economy*, Vol. 106, pp. 997-1032.

⁵³ See 'The economic impact of migration' focus section of 'Labour Market and wage developments in 2007', *ECFIN* (2008).

⁵⁴ Levy, F. and P. Temin (2007), 'Inequality and institutions in 20th century America', *NBER Working Paper* No 13106.

Checchi, D. and C. García-Peñalosa (2008), 'Labour market institutions and income inequality', forthcoming in *Economic Policy*.

Graph 30: Top income percentile for 16 countries over the twentieth century



Source: Roine et al. (2007).

Levy and Temin (2007) argue that income distribution in the US before and after the 1980s was strongly shaped by LMIs. The early post-war years of the 20th century were dominated by unions, progressive taxes, and high minimum wages, whereas more recent years have seen a reversal in these dimensions and a widening of income inequality. Gordon and Dew-Becker (2008)⁵⁵ show that movements in the P50/P10 ratio in the US are consistent with decreased union density and lower real minimum wage during the period 1979-1986. Technological and trade development would have amplified the effect of less rigid LMIs. However, the contribution of more flexible LMIs to the increase in wage inequality declines when the skill structure of the labour force is taken into account.

Checchi and Garcia (2008) assess the links between LMIs, labour market outcomes (i.e.

unemployment rate, wage dispersion and labour share) and income inequality.⁵⁶ The impact of LMIs on income inequality is a priori ambiguous, as stronger LMIs result in i) higher unemployment rates, which increase inequality; ii) less wage dispersion, which reduces inequality; and iii) higher labour share, with an ambiguous effect on inequality.

However, their econometric analysis suggests that, with the exception of the tax wedge, LMIs engender a trade-off between inequality and unemployment. Essentially this implies that the reduction in inequality brought about by a compressed wage distribution more than offsets the increase in inequality induced by the higher unemployment rates that tend to accompany stronger LMIs.⁵⁷ Interestingly, two clusters of institutions are identified: *wage-setting* and *employment security* institutions. *Wage-setting* institutions (stronger in the Nordic countries)

One could argue that institutional changes, most notably changes in LMIs, are a response to globalisation. However, Levy and Temin (2007) strongly dispute this for the US and claim that globalisation clearly does not determine institutions.

⁵⁵ Dew-Becker, I. and R.J. Gordon (2008), 'Controversies about the Rise of American Inequality: A Survey', *NBER Working Papers* 13982, National Bureau of Economic Research, Inc.

⁵⁶ The following LMIs are considered: EPL, the tax wedge, the minimum wage, the unemployment benefit, union density and coverage and the degree of centralisation/coordination of wage bargaining.

⁵⁷ Burniaux et al. (2006) find that stronger unions are associated with lower income inequality, especially at the lower end of the income distribution. See Burniaux, J.M., F. Padrini and N. Brandt (2006) 'Labour market performance, income inequality and poverty in OECD countries', *OECD Working Paper*, No 500.



seem to be more effective at reducing inequality than *employment security* institutions (stronger in continental Europe), the reason being that the former have a weaker negative effect on unemployment than the latter. Anglo-Saxon countries exhibit the weakest institutional set-up of any kind and the highest levels of income inequality.

Few researchers have analysed the interactions between monetary integration and income inequality (e.g. Bertola, 2007).⁵⁸ Within a monetary union, labour market features become even more crucial in shaping wage and unemployment developments, and thus income inequality. If nominal wages are rigid, foregoing devaluations may require sharper activity slowdowns and unemployment increases in order to restore competitiveness. Monetary integration requires enhanced wage and employment flexibility in response to sectoral or regional shocks. It also requires well-developed financial markets to allow households to hedge more easily against risks related to cyclical fluctuations in income.

Finally, monetary integration has an impact on the ability of governments to redistribute. On the one hand, new sources of risk increase the appeal of policies meant to buffer the welfare implications of uninsurable risk, and may explain why more open countries' governments are more deeply involved in economic and social issues. On the other hand, international integration affects the viability of national redistribution, as it is more difficult for these policies to shape individual choices differently from what would be implied by market mechanisms. Depending on whether demand or supply influences dominate, integration may in practice increase or decrease the intensity of redistribution.

With a number of caveats, notably the comparability of the datasets, the evidence suggests that global trends, such as skill-biased technological progress, may have played a role in driving inequality over time. However, country-specific patterns in wage inequality have tended to prevail in recent years, making an explanation

⁵⁸ Bertola, G. (2007) 'Economic integration, growth, distribution: does the euro make a difference?', *mimeo*, 4th annual DG ECFIN research conference.

based on common shocks implausible. Indeed, the evidence suggests that LMIs may explain most of the change in wage inequality over time across countries.

Determinants of top income shares

The empirical evidence suggests that economic growth disproportionately benefits the top percentile (e.g. Roine *et al.*, 2007⁵⁹). Similarly, inequality at the top of the income scale rises as financial development proceeds, particularly at the early stages of economic development (i.e. emerging economies). Openness to trade has no clear distributional impact. If anything, openness reduces top income shares. Tax progressivity significantly reduces top income shares, whereas the size of government spending has no clear impact on the rich, as it seems to have been neutral for the top but negative for the next nine percentiles. It is significantly positive for the nine lowest deciles.

Gordon and Dew-Becker (2008) find evidence for the US that skill-biased technical change is a major determinant of labour incomes at the upper part of income distribution, together with the fact that jobs at the top cannot be outsourced. Arbitrary managerial power also lies behind some of the outsized gains in top executives pay, along with stock options, which have created an automatic spillover from the stock market gains of the 1990s directly into executives' remuneration.

3. The labour income share: patterns and determinants

Labour income share patterns

There is no common trend across euro-area countries in the development of the labour share (Graph 31).⁶⁰ Sharp declines in labour shares are

⁵⁹ Roine, J., J. Vlachos and D. Waldenström, (2007), 'What Determines Top Income Shares? Evidence from the Twentieth Century', *Research Papers in Economics* 2007:17, *Stockholm University*, Department of Economics.

⁶⁰ The labour share is defined as the ratio between average wages and average labour productivity. The labour share is computed by attributing to the self-employed the compensation of the average employee of their own activity branch, then adding across all sectors in the economy.

displayed in Austria, Finland and Ireland. Moderate (though persistent) reductions are observed in France and Italy, whereas Germany and Spain have registered mild downward movements. In the Netherlands and Luxembourg, labour shares declined until the mid-1980s and broadly stabilised afterwards. The opposite applies to Belgium, Greece and Portugal, where labour shares increased until the mid-1980s, thereafter stabilising or declining. Outside EMU, labour share swings around a stable long-run value are found in Denmark and the UK, while a downward trend is observed for Sweden.

Labour income share: the role of compositional effects

Movements in the aggregate labour share conceal important sectoral developments. Overall changes in the labour share can be decomposed into changes in the sectoral composition of the economy, in the composition of employment (i.e. as employees or self-employed), and in the share of employees' remuneration in value added. The latter provides an indication of episodes of wage moderation or acceleration.

Graph 32 depicts a shift-share decomposition of the labour share using sectoral data from the EU KLEMS database covering the period 1970-2004.⁶¹ The analysis is performed for three sub-periods, namely 1970-1985, 1986-1995 and 1996-2004. In spite of the complexity and disparity of labour share movements across countries, some common patterns can be identified: i) Over the whole period 1970-2004, sectoral and employment composition effects have generally contributed to a reduction in the aggregate labour share; and ii) during the sub-periods 1970-1985 and 1996-2004 changes in the share of employees' remuneration in value added within each sector account for a large proportion

of the changes in the aggregate labour share. Whether this latter effect has contributed to a downward rather than an upward movement in the aggregate labour share depends on the country.

This analysis illustrates that it is generally incorrect to interpret movements in the labour share as exclusively stemming from the share of employees' remuneration in value added. Declining labour shares do not necessarily reflect episodes of wage moderation. As illustrated by Graph 32, part of the decline in the labour share in many countries is due to compositional effects arising from sectoral changes or from changes in the structure of employment, with an increasing weight of sectors with lower labour shares together with a widespread reduction in the proportion of self-employment in total employment.⁶² Hence, since the sources of declining labour shares, where they occurred, are partly structural, wage-setting policies alone will not be sufficient to reverse the downward trend observed in some countries.

A theoretical framework to account for labour share movements in the medium run

Early models tried to explain changes in the wage share in terms of underlying changes in relative factor prices. These models proved useful to account for labour share movements in the 1970s (box 5). An increase in relative wages starting in the 1970s led initially to an increase in the labour share but did not have 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 development can be explained by long lags or by the costs of adjusting factor proportions.

⁶¹ For details, see box 'Long-term trends in the labour share' in DG ECFIN (2008) 'Labour market and wage developments in 2007'; 24 sectors grouped into 9 broadly defined industries are included: 'Agriculture', 'Mining and quarrying', 'Manufacturing', 'Electricity, gas and water supply', 'Construction', 'Wholesale and retail trade', 'Hotels and restaurants', 'Transport and storage and communication', 'Finance, insurance, real estate and business services'.

⁶² A widespread reduction in the share of self-employed will translate into a lower aggregate labour share, as it implies that a lower level of compensation per employee is attributed to a given number of employed.



Box 5: The wage share and factor prices

The share of labour income flowing to wages is a function of the quantity 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.

If the elasticity of substitution equals 1 (i.e. a Cobb-Douglas production function), any increase in the supply of labour (relative to capital) would be accompanied by a proportionate change in its relative price, leaving factor shares unchanged (i.e. constant over time).

On the other hand, assuming an elasticity of substitution between capital and labour other than 1 explains medium-run movements in factor shares in response to changes in relative factor prices and labour-augmenting technical progress. In fact, a constant elasticity of substitution (CES) production function combined with the assumption of labour-augmenting technical progress can explain movements in factor shares jointly with their long-run stability. With a CES production function, the labour share will decrease (increase) in the capital-output ratio if the elasticity of substitution of capital and labour is above (below) 1.

Thus, the labour share depends on the capital-labour ratio (i.e. on how capital-intensive production is), with a sign that depends on the elasticity of substitution between capital and labour. Technological and institutional variables shift the relationship between the wage share and the capital-labour ratio (Bentolila and Saint-Paul, 2003).*

(*) Bentolila, S. and G. Saint-Paul (2003), 'Explaining movements in the labor share', *Contributions to Macroeconomics*, Vol. 3(1), pp. 1103-1103.

A second set of contributions (e.g. Blanchard and Giavazzi, 2003)⁶³ has analysed variations in the labour share in rent-sharing models: product market imperfections generate rents that are split between firms and unions. Seen in this light, downward movements in the labour share derive from a rise in rents accruing to firms owing to rising imperfection in the goods markets, which raises the price level and eventually reduces real wages, or to unions' weaker bargaining power. This incorporates the effect on the labour share brought about by product market regulation, which sets the entry costs and the degree of competition between firms, and by 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. However, this decline is seen as temporary; in the long-run enhanced product market deregulation should spur employment and the labour share should recover.

In much the same way as in the literature on the determinants of income inequality, a large number of empirical studies have sought to link movements in the labour share to SBTC and globalisation. Ellis and Smith (2007) claim that, by increasing the rate of obsolescence of capital goods, 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.⁶⁴

There are several reasons why globalisation may adversely impact on the labour share (e.g. Rodrik, 1997,⁶⁵ Harrison, 2002⁶⁶). 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, in developed countries the returns to labour and the labour share will decline, especially for the relatively

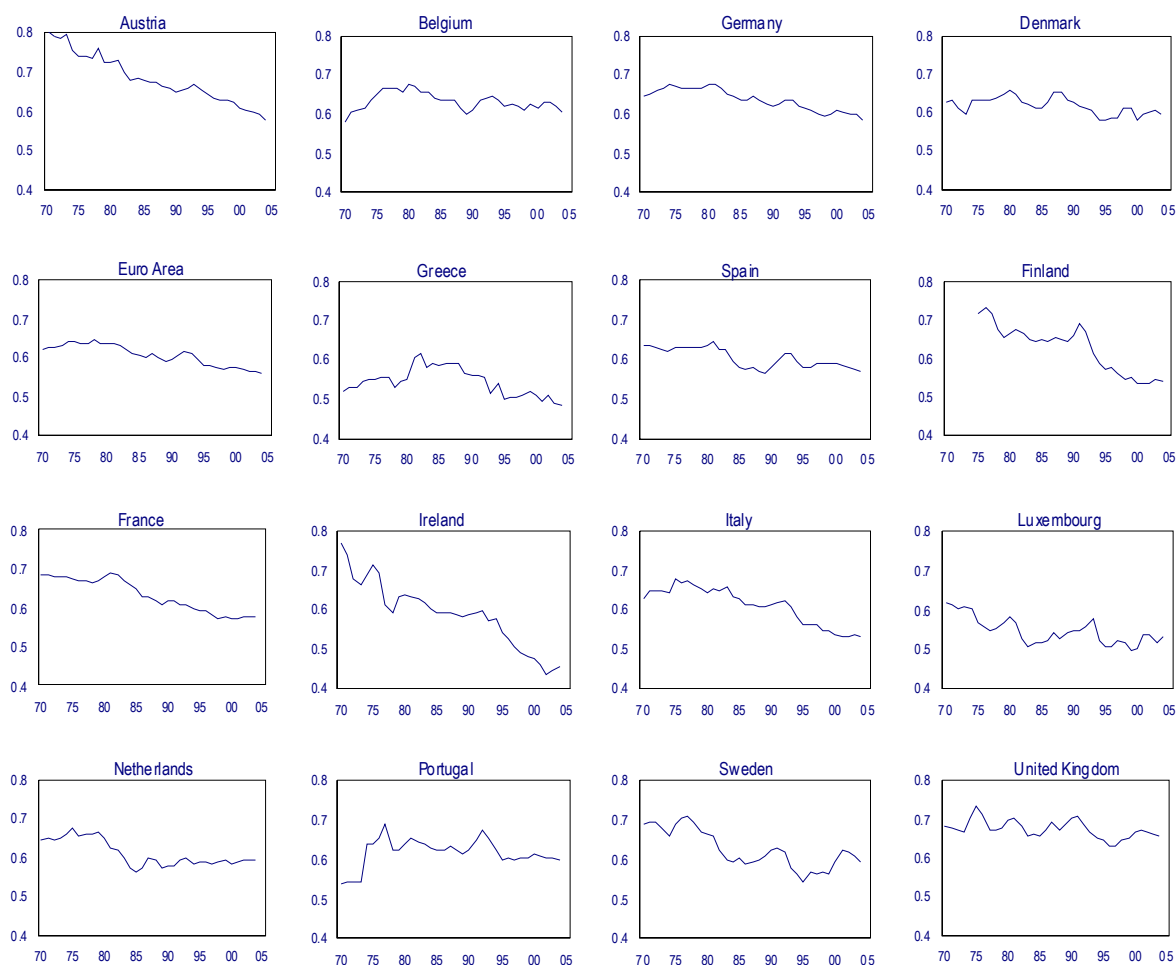
⁶³ Blanchard, O. and F. Giavazzi, (2003) 'Macroeconomic effects of regulation and deregulation in goods and labour markets', *The quarterly Journal of Economics*, Vol. 118(3), pp. 879-907.

⁶⁴ Ellis, L. and K. Smith, (2007), 'The global upward trend in the profit share', *BIS Working Papers 231*.

⁶⁵ Rodrik, D. (1997), 'Has Globalisation gone too far?', *Institute for International Economics*.

⁶⁶ Harrison, A.E. (2002), 'Has globalisation eroded labor's share? Some cross-country evidence', *mimeo*.

Graph 31: Labour share, EU15 Member States
EU KLEMS, 1970-2004



Source: Commission services' calculations on the basis of EU KLEMS data.

scarce unskilled labour.⁶⁷ Globalisation also makes capital more mobile, putting pressure on labour, the less mobile factor. Finally, some have argued that globalisation pressures might have pushed industrial countries to adopt labour-saving technologies, further squeezing the labour share. The European Commission (2007)⁶⁸ and the IMF (2007)⁶⁹ have shown that globalisation

may have reduced the share of income accruing to labour in advanced economies, but its effect is small. Indeed, the largest contribution to the fall in the aggregate labour share derives from the SBTC. 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 generally experienced a smaller decline in the labour share.

⁶⁷ 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.

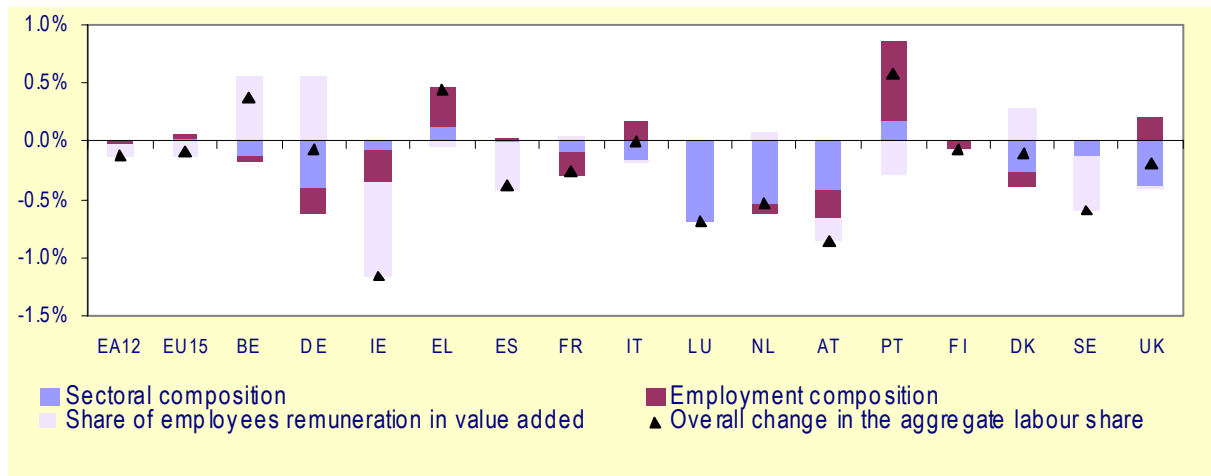
⁶⁸ European Commission (2007), 'The Labour Income Share in the European Union', *Employment in Europe, 2007*.

⁶⁹ IMF (2007), 'The Globalization of Labor', *World Economic Outlook*, April 2007.

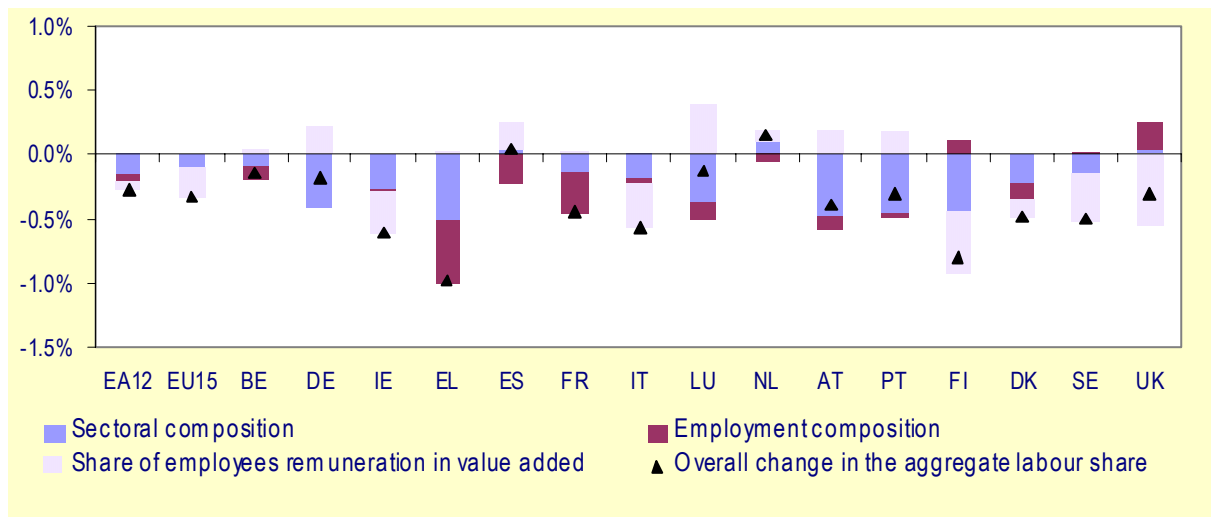
All in all, the labour share may be influenced by both demand and supply factors. The literature briefly reviewed in this focus section suggests that factors related to production technology are potentially important determinants of changes in the labour share. However, more competitive markets or changes in the supply of specific skills may also be a source of labour share movements.



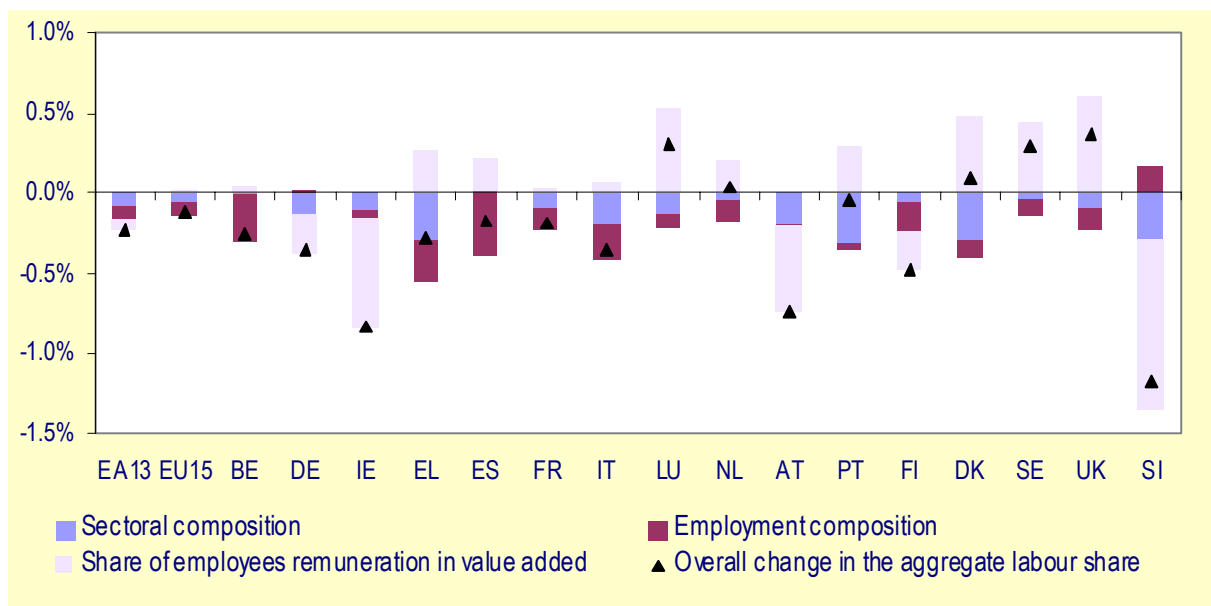
Graph 32: Sources of changes (AVG) in the labour share (EU15),
non-market services excluded
1970-1985



1986-1995



1996-2004



Source: Commission services' on the basis of EU KLEMS data.

4. The relationship between income inequality, wage inequality and the labour income share

Checchi and Garcia-Peñalosa (2008) present a unifying framework to analyse developments in income inequality and its relationship with wage dispersion 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 income from labour and from capital. Inequality depends on population proportions, the replacement rate, wage dispersion and the labour share. 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 Gini coefficient, 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. On the other hand, a higher labour share increases the income differential between employed and unemployed individuals, raising inequality within the group of non-capital owners.

However, the evidence provided suggests that the effect of inequality between capital owners and non-capital owners is greater than the inequality within groups (employed versus unemployed workers). Thus, a lower labour share raises income inequality.

One question is how 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 have 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 almost all euro-area countries) and 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 has had a strong equalising effect.

5. Conclusion

This focus section has presented evidence of income inequality and labour share patterns over time. The wage moderation of the last decade has been accompanied by a declining labour share, giving rise to distributional concerns. This pattern does not stem exclusively from wage moderation, but also from changes in the sectoral composition of the economy. Accordingly, wage policies alone will not be sufficient to reverse the trend in labour shares observed in some euro-area countries.

Furthermore, it is important to bear in mind that the labour share is only a partial indicator of income inequality. Any exhaustive appraisal of inequality trends must take also account of changes in the distribution of wages and personal disposable income, which includes other sources of income besides earnings. For instance, persistent labour underutilisation increases inequality as it raises the proportion of people with low incomes.

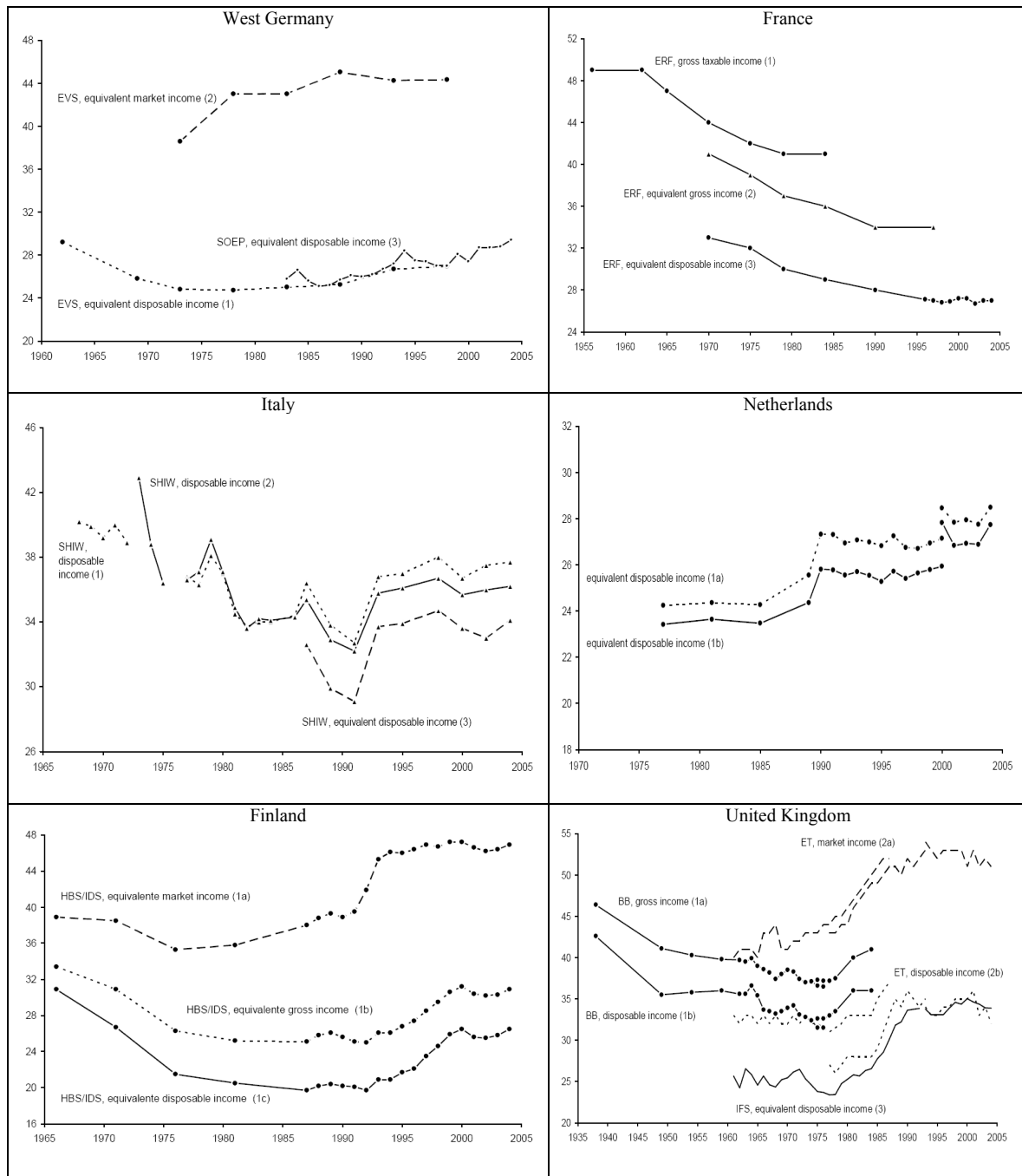
As regards the effect of skill-biased technological change on income inequality, it is often argued that one way of sharing the premium on skilled labour as evenly as possible is to raise the level of education. However, an increase in the skilled labour supply will endogenously lower the skill premium, inducing substitution between skilled and unskilled, thus depressing the labour share and leading to offsetting effects on income inequality.

Beyond increases in spending on education and training, the quality of expenditure is crucial. The comparison of Gini Indices on market and disposable incomes reveals that public redistribution through taxes and transfers can have a strong equalising effect in mature economies.

Regarding the role of labour market institutions as a source of equalisation, several insights are worth mentioning. On the one hand, with the exception of the tax wedge, which shows a positive correlation with the Gini coefficient, LMIs engender a trade-off between inequality



Graph 33: Gini index in selected countries



Germany: (1) equivalent disposable income of households; weighted by person; OECD equivalence scale; only German population. (2) equivalent market income of households; weighted by person; OECD equivalence scale; only German population. (3) equivalent disposable income of households, included imputed rent; weighted by person; modified OECD equivalence scale. France: (1) excluding non-taxable incomes; weighted by household. (2) excluding property income and some social benefits; weighted by household; OECD modified equivalence scale; only households with non-negative taxable income and positive disposable income. (3) excluding property income and some social benefits; weighted by person; OECD modified equivalence scale; only persons in households with nonnegative taxable income and positive disposable income. Italy: (1) excluding imputed rents, interest and dividends; weighted by household; figures for 1968-1972 estimated from grouped data. (2) excluding interest and dividends; weighted by household; figures for 1973-1975. (3) weighted by person; square root equivalence scale. United Kingdom (1a) gross income of tax units; (1b) disposable income of tax units; in both cases, weighted by tax unit; the first series is for incomes net of amounts spent on mortgage interest (old basis), while the second is for incomes gross of those amounts (new basis). (2a) market income; (2b) disposable income; in both cases, weighted by household; the first series refers to unadjusted incomes, the second series to equivalent income. **Source:** Brandolini and Smeeding (2007).

and unemployment. This implies that the redistributive role of LMIs other than the tax wedge, namely, EPL, the minimum wage, unemployment benefit, union density and coverage and the degree of centralisation/coordination of wage bargaining, is to increase the wage share at the bottom end of the distribution. It also means that the reduction in inequality brought about by a more compressed wage distribution more than offsets the increase in inequality brought on by the higher unemployment rates, usually associated with stronger LMIs.

A caveat is, however, in order. Even if the predominant effect of LMIs is to reduce the wage dispersion, this does not need to translate

into reduced income inequality from the household perspective. For instance, minimum wages may be ineffective in narrowing income distribution when none of the members of poor families is employed.

In any case, changes in the design of LMIs may improve the trade-off between inequality and unemployment and be welfare-enhancing. Policies that increase participation and reduce unemployment may contribute to reducing income inequality. Similarly, coordinated wage-setting institutions are more effective at reducing inequality than employment protection institutions, as they tend to have a weaker negative effect on unemployment.