Research note

Growth and inequality in the EU

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ABSTRACT

The concern here is to analyse the effect of economic growth on the distribution of income in EU Member States. The paper reviews relevant empirical studies which have been carried out into this relationship over recent years and examines the experience across the European Union over the first half of the present decade, investigating in particular the different channels by which growth can affect income distribution, focusing its effect on employment and household circumstances as well as on the dispersion of earnings, which has tended to be the primary centre of attention of recent research.

The research note also reports empirical results on the different channels by which growth seems to have affected different aspects of inequality in EU countries during the first half of the present decade. The analysis indicates that there is no simple relationship between growth and inequality in the countries examined. Inequality of labour earnings has increased in both relatively high growth and low growth countries, though less in the former than the latter, and examples of declining inequality was also found in both country groups.

On the other hand, results show that the direct effect of employment growth in reducing inequality is more straight-forward. In countries where economic growth gives rise to an increase of the employment rate, inequality of labour income among those of working age tends to decline. Increasing employment tends also to reduce the proportion of those living in workless households, so contributing to a more equitable distribution of employment and labour income between households.

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I. Introduction

The classic study by Kuznets of the effect of growth on inequality states that in the early stages of the development process, inequality tends to rise with growth, and then after a while it starts to fall as economy expands. Recent empirical studies investigating the cross country relationship between the rate of growth and inequality conclude that growth tends to be distributionally neutral on average, in that inequality tends to fall about as often as it rises in growing economies (Ravallion 2004). Reviews of the relationship between growth and inequality conclude that is not growth *per se* which seems to affect inequality but the way in which growth comes about and what its precise effects are.

In this research note, the concern is to review research on the relationship between economic growth and different aspects of inequality, which are affected by the growth process. It also reports empirical results on the different channels by which growth seems to have affected different aspects of inequality in EU countries during the first half of the present decade. More specifically, Section 2 reviews theories of the effect of economic growth on income inequality and the findings of studies on the effect of growth on inequality during the 1990s. Section 3 reports basic facts about growth in EU countries during the first half of the present decade, while Section 4 sets out some empirical evidence on the effects of economic growth on different aspects of income inequality.

II. Economic growth and aspects of inequality

Effects of growth on different aspects of inequality

The effect of economic growth on household income distribution depends on the distribution of the increase in the value added involved between capital and labour[1]. Capital income tends to be much more unequally distributed than labour income. For a large majority of households, earnings from employment are the predominant source of income, though a small number of household typically have very high income from business capital and other investment. Consequently, if the share of capital in value-added increases, income inequality is likely to increase at the same time. Moreover, in these circumstances, there may well be relatively little general increase in the disposable income of households, so that growth of GDP is not reflected in an overall increase in average income per head, which implies, accordingly, that GDP growth is not necessarily a good indicator of social welfare or general well-being as it is often assumed to be.

Nevertheless, since for most households, the major part of income comes from employment, the main interest is in the effect of growth on the distribution of this between households. The focus, first, therefore, is on the distribution of labour income among the employed and on the possible mechanisms linking economic growth and the distribution of labour income in a simple growth accounting framework. If, to simplify, it is assumed that the economy can be divided into a high productivity/high wage sector and a low productivity/low wage sector, with uniform wages in each sector, GDP growth can be decomposed into the growth in each of the sectors which in turn might be further decomposed into employment growth and productivity growth (value-added per person employed)[2]. Accordingly, economic growth will not necessarily give rise to changes in income distribution. If employment in both sectors grows in the same proportion, or if productivity (and

[1] A more complete treatment of the effects of economic growth on income inequality can be found in Bourguignon (2004).

[2] More precisely, if employment in time t and sector k is e^k_t and productivity (GDP per worker) is p^k_t, total output is $g_t=\Sigma_k e^k_t p^k_t$ Change in total output is $\Delta g=\Sigma \underline{p}_k \Delta e_k+\Sigma \underline{e}_k \Delta p_k$ where Δ is the time difference operator, and underline stands for time average (see e.g. Jeong 2008).

wages) grows at the same rate in both sectors, the dispersion of earnings among those employed will remain unchanged[3].

However, economic growth might also occur in ways that affect the distribution of earnings:

1) Growth might come about through an increase in the productivity in one of the two sectors: if productivity in the low productivity/low wage sector rises, then inequality will be reduced, while it will increase if productivity in the high productivity sector rises.
2) Structural change of the economy: if the rate of employment growth differs between the high productivity/high wage sector and the low productivity/low wage sector, the structure of the economy changes. This will alter the level of overall inequality even if relative income of the sectors does not change.

Growth in the first case has an effect on inequality by changing the income gap between different groups, while in the second case, it affects inequality by modifying the composition of the employed population. Of course, sectors might differ not only in terms of mean incomes but also in terms of the dispersion of earnings within them, which makes the effect on inequality of growth and the structural change which accompanies it more complicated, the outcome depending on the relative degree of dispersion within each of the sectors and which particular parts of the sector are affected.

The distinction between low productivity/high productivity sectors might correspond approximately to the division between sectors of the economy or a region, for example, though it might also apply more generally to all types of subgroup which differ in their productivity and wage level, for example, higher skilled or lower skilled workers. According to human capital theory, more educated workers should enjoy higher wages reflecting their higher productivity. Workers also tend to accumulate knowledge while working, so experience should also be rewarded with higher wages. In addition, it is commonly argued that technological advance tends to increase inequality in earnings in developed countries because it raises the productivity of higher educated workers relative to the lower educated in all sectors of the economy (for a review of theory see Aghion et al. 1999, Gottschalk and Smeeding 1997). If in the short-run the growth in the supply of educated people fails to match the increase in the demand, the premium for education increases. Sudden technological changes might also cause a change in the steepness of the age-earnings profile, in that the education of younger people might be more adapted to the requirements of new technology than the education and skills of older workers. In such cases demand will grow more for the young who are well educated and less for older workers which will result in a less steep cross-sectional age-earnings profile.

Growth occurring through, or being accompanied by, structural changes in the economy is the kind of development process Kuznets described. The increasing population share of the initially small high-income group – other things being equal – results first in rising inequality, which continues up to the point where inequality reaches a maximum. Further increases in the population share of the high-income group then results in declining inequality (Ferreira 1999).

Atkinson (2007) also draws attention to the importance of change in the educational composition of the work force on inequality. When demand and supply of skilled workers grow at the same rate, the skill premium converges to an equilibrium, but earnings inequality continues to change because of the changing skill composition of the labour force. Inequality, therefore, can change even if the income gap between education groups remains unchanged.

The mechanisms described above are relevant for the distribution of wages among the employed. The final aim here, however, is to understand the link between economic growth and the distribution of income between individuals. In order to make progress in this direction, there is a

[3] This conclusion of course requires that the inequality measure fulfils population independence and scale independence properties.

need to consider the distribution of labour income not only among those employed but also between all those of working age as well as between households, since employment growth clearly affects income differences between those employed initially and those who gain employment as a result of job creation (Atkinson and Brandolini, 2004). Increasing employment, therefore, will have an inequality reducing effect, but – as discussed above – the overall effect on inequality also depends on how inequality among the employed changes.

Since it is household income, which ultimately determines the well-being of individuals, it is clearly important to study how growth affects the distribution of labour income among households. Gregg and Wadsworth (1996) and Redmond and Kattuman (2001) have investigated the effect of 'employment polarisation' on the distribution of incomes, in the sense of employment being concentrated on particular households and growth not affected the proportion living in jobless households[4].

In sum, the growth of employment or wages can have the effect of reducing inequality in the distribution of labour income between households, if it is concentrated in workless or low-income households. Employment growth will increase inequality if it is concentrated in 'work-rich' or higher income households.

Growth might also have an effect on the inequality between households with labour income and those without labour income. The largest group of households without labour income consists of those in retirement, and if pension are not indexed in line with average wage growth, but perhaps in relation to price inflation instead, economic growth will lead to a widening gap between those in employment and the elderly.

Growth and inequality during the 1990s

The relationship between economic growth and inequality is usually studied over the long-term. Here, the focus is not on the experience over several decades but on the relationship during the past few years, beginning with a review of the effect of growth on inequality during the 1990s.

Among EU15 countries, economic growth was highest in Ireland and Luxembourg during the 1990s (7% and 6% a year, respectively – see Table 1 in the Appendix), followed by the Netherlands, Spain and Portugal, where growth averaged close to 3% a year. The lowest growth rates were recorded in Germany, France, Sweden and Italy, at below 2% a year, with growth in the other countries averaging between 2% and 3% a year.

In the transition countries, apart from Poland, average growth rates were negative in early years of the transition between 1990 and 1995, the Baltic States being hit particularly hard. In the second half of decade, the majority of transition countries recovered from recession and registered average growth rates of 4-5% a year, the Czech Republic being the main exception, with growth of only 1-2% a year.

Among the EU15 countries, employment growth was highest in the countries experiencing the highest GDP growth – in Ireland (3'5% a year), the Netherlands, Luxembourg and Spain (1-2% a year in each case). Employment declined over this period in Portugal (despite the growth of GDP), Sweden and Finland.

In the transition countries, employment fell considerably during the recession years at the beginning of the 1990s. In the second half of the decade, GDP growth led to some growth in employment, but by the end of the decade, the employment rate was considerably lower in these

[4] A related issue is the correlation between the earnings of husbands and wives. A number of studies (e.g. Gronau 1982, Callan et al. 1998, Cancian and Reed 1998) which have analysed this have concluded that 'assortative pairing' tends to increase inequality of labour income among households.

countries than in 1990. In Slovakia, Hungary and Estonia the fall in the employment rate was over 20 percentage points, while other countries recorded falls of 10-15 percentage points.

The European Community Household Panel (ECHP) throws some light on what happened to income inequality over this period, or at least over the period 1994-2001. It indicates that inequality in gross hourly earnings rose in the Netherlands, Greece, and Germany and declined in Ireland, Austria and France between these years (Moisala 2004). The OECD Earnings Database shows similar trends for these countries (though Austria and Greece are not covered). In addition, the OECD database, which contains data on countries not covered by the ECHP, indicates an increase in the inequality of gross earnings in Hungary, Poland and Sweden during the 1990s.

According to Rutkowski (2001), on the basis of the Transmonee database[5], inequality of earnings increased significantly in transition countries over the 1990s. The Gini coefficient of earnings inequality, which was between 0.22 and 0.27 in these countries at the beginning of the period, increased by 0.04-0.06 in the first half of the 1990s, except in Lithuania where it rose by more. During the second half of the decade, earnings inequality continued to increase in most of the countries, except Lithuania and the Czech Republic.

Changes in 'between group' wage differences: the case of education

As noted above, education is a major determinant of individual productivity and wages and it is often argued that recent technological changes have been skill biased, that they have increased the demand for more educated workers. This might result in an increasing wage premium for such people if in the short run the increase in supply is not able to match the increase in demand.

A number of studies have investigated the level and changes in the education premium in the EU and compared it across countries[6].The Public Finance and Private Returns to Education (PURE) project, which used national statistical sources to compare wage premia in 15 EU countries[7] up to the mid-1990s, indicates that the wage premium associated with one additional year of schooling was highest in Portugal, Austria and Switzerland, while the lowest premium was in Sweden, Norway, Italy and Greece (Pereira and Martins 2004). Results of the PURE project were broadly confirmed by Heinrich and Hildebrand (2005), whose estimates were based on the ECHP.

Estimates for the second half of the 1990s can be found in Budria and Telhado-Pereira (2005) and Strauss and de la Maisonneuve (2007)[8], as well as for the years 1999-2001, with the former finding the highest wage premium for upper secondary and tertiary education in Portugal and Italy and the lowest in Sweden, Finland and Norway, the latter finding an average premium for tertiary education of 9% and the highest levels in Portugal, Ireland, the UK (11-12%) and Hungary (14%). Estimates of wage differences according to education level have also been made using the 2002 Structure of Earnings Survey, with low levels of education having the strongest effect in reducing wages in the transition countries, in particular Romania, Hungary, Poland, Slovenia and Slovakia, though also in Portugal (EC, 2006).

So far as trends in the wage premium are concerned, the PURE project found decreasing returns to education in Austria and Sweden from the beginning of the 1980s to the mid-1990s and

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[5] TransMONEE is the database associated with the UNICEF Innocenti Research Centre's MONEE project.

[6] An extensive list of country-specific and comparative studies is listed in Peracchi (2006).

[7] Wage premia were calculated following the Mincerian methodology, using log hourly gross wages as the dependent variable (except in countries where only data on net wages were recorded).

[8] Budria and Telhado-Periera estimate the returns to different levels of education for nine European countries during the nineties using data from the EDWIN ("Education and Wage Inequality in Europe") project. Strauss and de la Maisonneuve (2007) investigate the returns to tertiary education for 21 OECD countries, which contain 15 EU Member States and two transition countries Hungary and Poland. Estimates for the EU countries were obtained using the ECHP and the British Household Panel Survey in case of the UK, while estimates for Hungary and Poland were obtained using the CHER database.

increasing returns in Denmark, Portugal, Finland and Italy (Pereira and Martins 2004). According to Budria and Telhado-Pereira (2005), the fall continued in Sweden in the second half of the 1990s, as did the increase in Italy though the trend reversed in Portugal and Finland, while returns increased in Germany and Greece and declined in France and in the UK and Norway, there was little change. According to Strauss and de la Maisonneuve (2007), the wage premium for tertiary education increased during the second half of the 1990s in Italy, Denmark, Ireland and Germany, while in the Netherlands and Austria, it declined or remained unchanged.

To summarise, the return to education increased after 1994 in Italy, Germany, Greece and the transition countries[9], while in Portugal, Finland, Sweden, Netherlands and Austria, it seems to have fallen.

Effect of changes in the composition of employment

The composition of those in employment changed in several respects during the 1990s. Education levels generally increased, as reflected in a rising share of those with tertiary qualifications, while the number of women in employment also rose in the EU15 countries at least. At the same time, the average age of those in work increased as did the share of employment in services at the expense of that in agriculture and industry. Cholezas and Tsakloglou (2007) analysed the effect of these changes on earnings inequality during the period from the mid-1980s to the end of the 1990s for eight European countries[10]. They concluded that while most often it was changes in inequalities within groups (e.g. those with tertiary education) that were mainly responsible for changes in overall, in some cases changes in the composition of the had a significant effect as well. For example, the increase in education levels of the labour force had the effect of reducing inequality in Germany and Finland while being responsible for an increase in inequality in Sweden and Norway. Similarly, the changing age composition had the effect of reducing inequality in Germany and increasing it in Sweden.

Distribution of earnings among people of working age

The above has reviewed the evidence on the distribution of earnings among the employed. The change in employment itself, however, has also affected income distribution. Burniaux et al. (2006) have shown that during the 1990s falling unemployment was associated with diminishing inequality of income over the population as a whole. In most of the countries where unemployment declined after 1993-94, such as Belgium, Denmark, Ireland, Italy, Finland, Netherlands, Spain and the UK, income inequality also declined, an increase in inequality among wage-earners being offset by more people being in work.

The tendencies observed during the 1990s can be summarised as follows. Countries with relatively high growth rates like Ireland, Spain and Portugal recorded increasing inequality of earnings in the first half of the 1990s, but the increase came to end in the second half of the decade as the rate of growth rose. This was also the case as regards returns to education in these countries, an increase in returns being reversed after 1995. In Ireland, growing immigration of educated labour contributed to increasing the supply of skilled workers (Barrett et al. 2000), while in Spain, the expansion in the supply of university graduates was larger than the increase in demand.

In the Netherlands, the pattern was different. Relatively high growth was associated with increasing inequality over the whole period. Inequality of earnings also rose in Germany and Sweden in which countries growth was slow. In the transition countries, inequality of earnings increased both in the recession in the first half of the decade and in the growth of the second half.

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[9] According to Svejnar (1998) and Rutkowski (2001).

[10] They investigated the effect of compositional changes by decomposing the change in the mean log deviation index following the methodology of Mookherjee and Shorrocks (1982). The method is described in more detail below.

The returns to education rose in these countries. In the first half of the decade, structural changes associated with the transition were the main factor behind increasing demand for skilled labour. In the second half, technological advance associated with foreign direct investment also contributed.

III. Economic growth and changing employment composition, 1998-2005

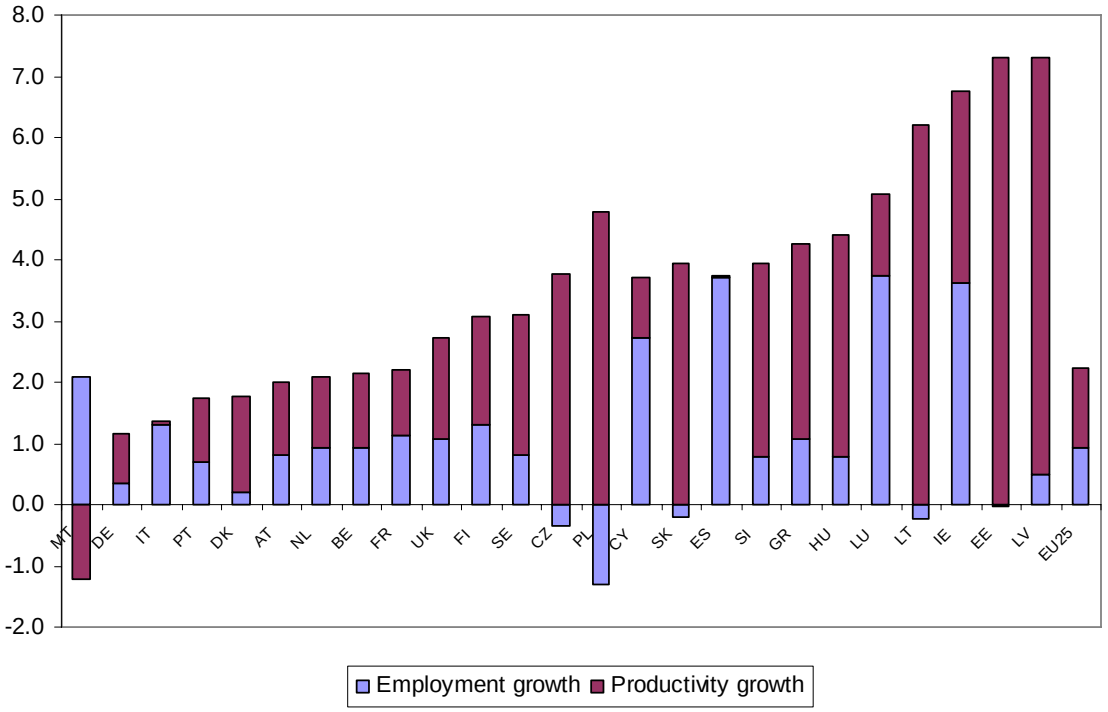
Growth trends 1998-2005

Over the period 1998-2005, rapid economic growth occurred in the three Baltic States and Ireland, GDP increasing by 6-7% a year on average. Luxembourg (5%), Greece and Hungary (4-4.5%) also recorded relatively high growth rates. In Spain, Cyprus, Slovenia, Slovakia and Poland, growth averaged 3.5-4% a year, in Finland, Sweden, the Czech Republic, 3-3.5% and in the UK, France, Belgium, the Netherlands and Austria, 2-3%. In the rest of the EU, growth was less than 2% a year.

GDP growth can be decomposed into productivity growth and employment growth (Figure 1). Productivity increased most in the Baltic States, by over 6% a year. In other transition countries, Slovakia, Poland, the Czech Republic and Hungary, the increase was also relatively high (around 4% a year), as it was in Slovenia, Greece and Ireland (over 3% a year). On the other hand, in Malta, Spain, Italy and Germany, there was relatively little growth in productivity over the period.

Employment growth was highest in Spain, Luxembourg and Ireland, at over 3% a year. In Cyprus and Malta, it was over 2%, while in Italy, Greece, France, the UK and Finland, it was only just over 1% a year. In Estonia, Denmark, Germany and Latvia, employment hardly increased at all, while in Poland, Czech Republic, Lithuania and Slovakia, it declined over the period.

Fig 1. Productivity growth and employment growth in EU countries between 1998 and 2005 (% a year)



Note: Countries are ranked according to rate of GDP growth (1998-2005).

Source : Eurostat NewCronos database

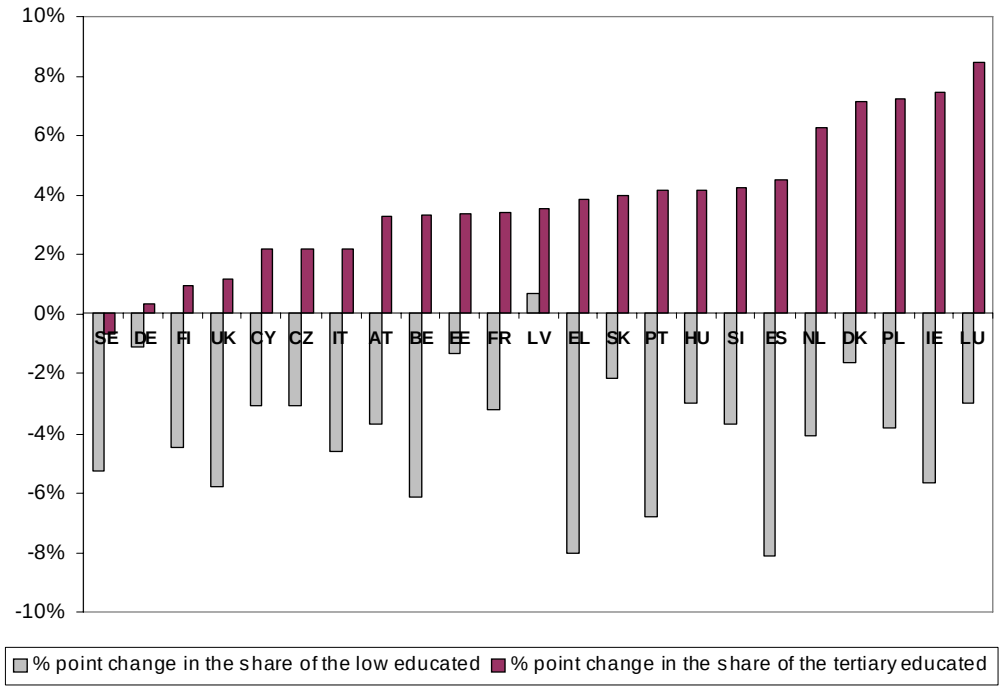
In terms of inequality, it is not absolute employment growth which matters but the change in the employment rate (see Table 2. of the Appendix). The employment rate of those aged 15-64 increased the most in Spain, by 12 percentage points, between 1998 and 2005,, followed by Ireland, with an increase of by 7 percentage points. The rate also rose significantly in Italy (by 6 percentage points) and Greece (by 4 percentage points) and by only slightly less than in the latter in Finland, Belgium and France. In the Czech Republic, Slovakia, Malta, Estonia and Poland, the employment rate declined over the period.

Characteristics of employment growth and changing structure of employment

Employment growth in EU countries was not uniform in all sections of the labour force over this period (EC 2006).In almost all of the countries, it was higher than average among the higher educated and lower than average among the lower educated (Figure 2). Exceptions are Lithuania and Sweden, where employment growth of the higher educated was lower than average and Latvia where employment growth among the lower educated was higher than average. Employment of the lower educated, i.e. those with only basic schooling, increased in only three EU countries, Spain, Cyprus and Latvia. The proportion of those with tertiary education increased the most in Luxembourg, Ireland, Poland, Denmark and the Netherlands, while the proportion of those with only basic schooling declined the most in Greece, Spain, Portugal and also the UK, Ireland and Belgium.

Other features of employment growth were an increase in employment of women, associated in a number of countries with rising part-time employment. The age structure of those in work also changed with: employment of older people aged 55-64 increasing while employment of young people under 25 declined.

Fig 2. Changing structure of employment by education level in EU countries, 2000-2005



Note: Education is a three-category variable: low education (completed education level lower than upper secondary), middle-level education (upper secondary education- not showed on the graph) and tertiary education.

Source: LFS

IV. The effect of growth on different aspects of inequality in labour income

This section analyses the effect of changes within groups and between groups on the inequality of distribution of income from employment – in particular, of changes in the gender, age and education composition of those in employment. The methodology follows that proposed by Mookherjee–Shorrocks (1982) for the decomposition of inter-temporal changes in inequality, which is to use the Mean Log Deviation (MLD) index divided into three components to do this[11]. The first component is a "pure" inequality increase effect – i.e. the effect attributable to an increase in inequalities within particular groups. The second component is the effect of the change in population shares of the various subgroups. This effect can be further decomposed into two terms. The first is the change in inequality brought about the changing population share of sectors with different degrees of within-group inequality. For example, the increasing share of a sector with high within-group inequality has the effect of increasing inequality. The second effect is the changing share of sectors with different mean incomes. This term measures the effect of growth on inequality emphasised by Kuznets. The effect of an increase in the share of a sector with high mean income on aggregate inequality is ambiguous. It is likely to increase inequality if the initial population share of the high-income sector is low, but it can lead to a reduction in inequality if the share of the high-income sector is already high initially.

The third component measures the effect of a change in relative mean incomes of the various subgroups. Economic growth is most directly linked to the last two terms of the decomposition – i.e. to the effect of a change in sectoral mean incomes and of a change in the population share of sectors with different mean income levels (Jeong 2008). Accordingly, the main interest is in these two components of the decomposition.

Unfortunately there is no consistent series on income which covers the first half of the present decade. The growth-inequality relationship is, therefore examined by comparing the 2005 EU-SILC with data from the European Community Household Panel (ECHP) for 1998. Although the former is a replacement for the latter, there are several differences in methodology between the two surveys which can affect the comparability of the data derived from them. The analysis here is based on a comparison of the distribution of earnings for those employed for a full year, which ought not to be affected by methodological differences, except perhaps to the extent that for the Nordic countries, the EU-SILC uses administrative data on income instead of survey data as used by the ECHP. For some countries, net rather than gross earnings are used to examine the distribution because the latter are not comparable between the two surveys. As the new Member States were not covered by the ECHP, these are excluded. Because of problems of comparability, France, the Netherlands and Germany are also omitted from the analysis. Gender (male, female), age (18-24, 25-40, 41-54, 55+ years old) and education levels (less than upper secondary, upper secondary and tertiary) are used as the grouping variables.

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[11] Mean Log Deviation index = $(1/n)\Sigma_{i=1,\ldots,n}\log(\mu/y_i)$, where y_i are individual incomes, n is sample size, μ is sample mean income. The change in the MLD index between two time periods, t and $t+1$ can be written, following Mookherjee and Shorrocks (1982)

$\Delta MLD \equiv MLD_{(t+1)} - MLD_{(t)}$

$\cong \quad \Sigma_k \underline{v_k} \Delta MLD_{(k)} \quad + \quad \Sigma_k \underline{MLD_{(k)}} \Delta v_k \quad + \quad \Sigma_k \underline{[\lambda_k - \log(\lambda_k)]} \Delta v_k \quad + \Sigma_k (\underline{\theta_k} - \underline{v_k}) \Delta \log(\mu_k).$

[*A* component] [*B1* component] [*B2* component] [*C* component],

where Δ is the time difference operator, and underline stands for time average, v_k is the share of subgroup k in total population ($v_k = n_k/n$), λ_k is the relative mean income of subgroup k ($\lambda_k = \mu_k/\mu$), and θ_k is the income share of subgroup k ($\theta_k = v_k \lambda_k$). Component *A* denotes inequality change due to change in within-group inequalities. Component *B1* denotes inequality change caused by the changing population share of sectors with different level of within-group inequality. Component *B2* is the change in inequality due to changing population share of sectors with different mean incomes. Component *C* denotes inequality change due to changes in group means.

As shown by Table 1, the largest increase in inequality of earnings of full-year, full-time employees as measured by the MLD index occurred in Austria, Germany and Denmark. There was also an increase in the UK, Italy and Luxembourg, though to a lesser extent. In Spain, Finland and Greece, on the other hand, inequality declined, while in Ireland and Portugal, it remained unchanged.

Table 1. Inequality of yearly labour income

	Inequality of yearly labour income among those employed full-year, full-time				Inequality of yearly labour income among the working age	
	Gini		MLD		Gini	
	1998	2005	1998	2005	1998	2005
AT	0,269	0,293	0,136	0,176	0.560	0.555
DE	0,255	0,275	0,124	0,159	0.572	0.610
DK	0,213	0,228	0,088	0,112	0.455	0.468
ES	0,358	0,287	0,218	0,137	0.714	0.591
FI	0,261	0,257	0,208	0,127	0.545	0.519
GR*	0,280	0,241	0,166	0,101	0.665	0.631
IE	0,310	0,311	0,166	0,162	0.668	0.635
IT*	0,209	0,236	0,088	0,100	0.634	0.566
LU*	0,287	0,314	0,148	0,164	0.571	0.581
PT*	0,343	0,352	0,209	0,200	0.616	0.613
UK	0,302	0,322	0,159	0,183	0.600	0.574

Note: Based on gross incomes except for countries marked with asterisk, which are based on net incomes figures.
Source: Own calculation based on ECHP (1998) and EU-SILC (2005) data.

Results of the decomposition analysis are summarised in Table 2 and more detailed results are shown in Tables 3.-11 in the Appendix. For a clearer understanding, the role of each component is indicated in relative terms – i.e. the three components of the decomposition sum to 100% of the change in overall inequality. The decomposition analysis shows that in general, the most important component of the change in inequality was the change in within group inequalities. In some cases however, the role of factors relating to growth also contributed to the change in inequalities. The decomposition by gender indicates that a diminishing earnings gap between men and women had the effect of reducing inequality in Italy, Luxembourg and, to a lesser extent, in Germany.

The population share of men and women of those employed full-time changes very little, so that inequality was not affected by a change in the gender composition of employment. A growing difference in earnings between young and older people, however, increases inequality in Italy and Luxembourg. In Spain and the UK, the difference in earnings between the two groups diminishes, so reducing inequality. Changes in the share of population of different broad age groups with different mean incomes has only a small effect in explaining changed in inequality. Increasing differences in earnings between those with different education levels increased inequality in Luxembourg, the UK and Denmark, while a reduction in the difference reduced inequality in Spain and Greece. An increase in the overall education level of the employed has the effect of increasing inequality significantly in Austria and Italy.

Table 2. Summary of effects of different factors on the change in inequality (1998-2005)

	Gender		Age		Education	
	Effect of change in population structure*	Effect of changing group means	Effect of change in population structure	Effect of changing group means	Effect of change in population structure	Effect of changing group means
Inequality increase		DE-		IT+	AT+	DK+
		IT-		LU+	IT+	LU+
		LU-	UK-	UK-	UK-	UK+
Decrease of inequality				ES-		ES-
						GR-

Note: +/- means that the given effect increased/decreased inequality by more than 10% of total inequality change. *Effect of change in population share of groups with different mean incomes (Term *B2* according to the terminology used in footnote 11).

Employment growth and inequality of labour income among those of working age

Employment growth can change the degree of inequality of earnings among those employed by changing the composition of the latter. At the same time, as emphasised in Section 2 above, employment growth is likely to have a direct effect on the distribution of earnings among the population of working age as a whole. By providing jobs for those not initially in work, employment growth can be expected to have the effect of reducing the inequality of income. The last two columns of Table 1 show the change in inequality in the labour income among those of working age over the period. The largest increase in the Gini coefficient occurred in Germany, where it rose from 0.57 to 0.61. In the other countries, it either remained unchanged or fell. The biggest fall in inequality was in Spain where the Gini coefficient declined by almost 20% from 0.71 to 0.59. There was also a significant decline in inequality in Italy, Greece and Ireland.

Table 3 shows the relationship between the change in the employment rate and the change in inequality. As is evident, in all countries where the employment rate increased, the inequality of income of those of working age declined. In Spain and Greece, this was combined with a decline in the inequality of earnings among the employed, but in Italy and Ireland, the effect of the rise in the employment rate in reducing inequality more than outweighed an increase in inequality of earnings in Italy and no change in this in Ireland.

Table 3. Changes in the employment rate and in inequality (1998-2005)

		Inequality of labour income among the working age		
		Decline	No significant change	Increase
Employ-ment rate	Decline		PT	
	No significant change		AT, BE, DK, FI, NL, UK	DE
	Increase	ES, GR, IT, IE		

The effect of employment growth on the inequality of employment among households

The effect of employment growth on the distribution of labour income among households could possibly be different from the distribution among individuals. Employment growth might, therefore, have the effect of reducing the inequality of the distribution of household income if it is concentrated in workless or low-income households and the effect of increasing it if concentrated

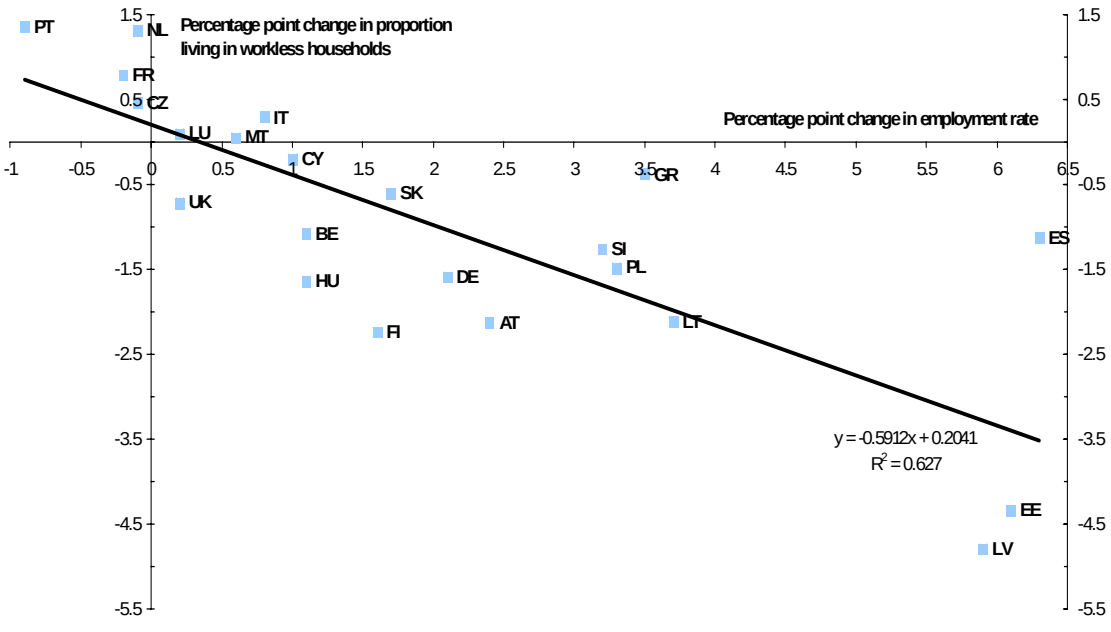
in work-rich and/or higher income households. This section investigates the relationship between a change in the employment rate and changes in the relative number of people living in jobless households. This is based on data from the Labour Force Survey, which enables the analysis to be extended to all EU Member States.

The proportion of people aged 15-64 living in workless households (see Table 12 of the Appendix) increased in Portugal, (from 7 to 8%), the Netherlands (from 12 to 13%) and France (from 16 to 17%). The largest reduction was in the Baltic States – by 4 percentage points in Estonia and Latvia and 2 percentage points in Lithuania. The proportion also declined, if to a lesser extent, in Finland, Austria, Belgium, Germany, Hungary, Poland and Slovenia.

As Figure 3 indicates, changes in the employment rate are inversely related, as would be expected, to changes in the relative numbers living in workless households – i.e. in countries where the employment rate increases, the proportion living in workless households fell. Accordingly, a rise in the employment rate tends to reduce inequality in the distribution of employment between households. The decline, however, is less than proportionate, a one percentage point increase in the employment rate being associated with a decline in the relative number living in workless households of just over half a percentage point.

Countries also differ in the extent to which the proportion living in workless households declines as the employment rate rises. In particular, the decline was proportionately more than elsewhere, given the increase in employment, in Finland, Austria, Hungary, Latvia and Estonia. On the other hand, in Greece and Spain, it was much less, the proportion living in workless households being reduced only slightly despite the significant increase in the employment rate, suggesting that almost all of those taking up work lived in households where someone was already employed.

Fig 3. Change in employment rate and in the proportion living in workless households, 2002-2006



Note: FR, MT, PL, SK, FI: 2003-2006; IT, AT:2004-

Source: Eurostat Labour Force Survey

V. Conclusion

This research note has examined the various effects which economic growth might have on inequality, such as by changing the difference in income between sections of the work force and by altering the composition of the employed but also by creating jobs for those unemployed or inactive as well as by changing the distribution of employment and labour income between households.

The analysis indicates that there is no simple relationship between growth and inequality in the countries examined. Inequality has therefore increased in both high growth and low growth countries, though less in the former than the latter, and examples of declining inequality was also found in both country groups. Even when similar economic forces are at work, the effect on inequality can differ between countries. For example, increasing demand for highly educated workers will tend to increase the educational wage premium only in countries where the increase in the supply of educated labour does not keep up with the growth in demand. Increases in the education level of those in employment will tend to increase inequality in countries where the initial educational attainment of the population is low, but might result in diminishing inequality in countries where it is high initially.

On the other hand, the direct effect of employment growth in reducing inequality is more straight-forward. In countries where economic growth gives rise to an increase of the employment rate, inequality of income among those of working age tends to decline. Increasing employment tends also to reduce the proportion of those living in workless households, so contributing to a more equitable distribution of employment and labour income between households.

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Appendix

Table 1. GDP growth en employment growth rate in EU15 countries during the nineties

	Real GDP growth rate (annual average, %)		Employment growth rate (annual average, %)	
	1990-1995	1995-2001	1990-1995	1995-2001
AT	2.0	2.5	0.2	0.6
BE	1.5	2.8	-0.2	1.1
DE	2.0	1.8	-0.3	0.6
DK	2.0	2.6	-0.5	1.0
ES	1.5	3.7	-0.5	2.8
FI	-0.7	4.9	-3.8	2.0
FR	1.1	2.5	-0.2	1.2
GR	1.2	3.5	0.6	0.7
IE	4.7	9.1	1.9	5.1
IT	1.3	2.0	-0.7	1.1
LU	5.4	6.1	0.5	2.6
NL	2.1	3.7	1.1	2.6
PT	1.8	3.4	-0.5	0.4
SE	0.6	2.9	-2.2	0.9
UK	1.6	2.8	-0.9	1.2

Source: Eurostat NewCronos database

Table 2. Evolution of employment rate in EU countries, 1998-2005

	1998	2000	2002	2004	2005	Change 1998-2005
AT	67.9	68.5	68.7	67.8	68.6	0.7
BE	57.4	60.5	59.9	60.3	61.1	3.7
CY		65.7	68.6	68.9	68.5	2.8
CZ	67.3	65.0	65.4	64.2	64.8	-2.5
DE	63.9	65.6	65.4	65.0	66.0	2.1
DK	75.1	76.3	75.9	75.7	75.9	0.8
EE	64.6	60.4	62.0	63.0	64.4	-0.2
ES	51.3	56.3	58.5	61.1	63.3	12.0
FI	64.6	67.2	68.1	67.6	68.4	3.8
FR	60.2	62.1	63.0	63.7	63.9	3.7
GR	56.0	56.5	57.5	59.4	60.1	4.1
HU	53.7	56.3	56.2	56.8	56.9	3.2
IE	60.6	65.2	65.5	66.3	67.6	7.0
IT	51.9	53.7	55.5	57.6	57.6	5.7
LT	62.3	59.1	59.9	61.2	62.6	0.3
LU	60.5	62.7	63.4	62.5	63.6	3.1
LV	59.9	57.5	60.4	62.3	63.3	3.4
MT		54.2	54.4	54.0	53.9	-0.3
NL	70.2	72.9	74.4	73.1	73.2	3.0
PL	59.0	55.0	51.5	51.7	52.8	-6.2
PT	66.8	68.4	68.8	67.8	67.5	0.7
SE	70.3	73.0	73.6	72.1	72.5	2.2
SI	62.9	62.8	63.4	65.3	66.0	3.1
SK	60.6	56.8	56.8	57.0	57.7	-2.9
UK	70.5	71.2	71.3	71.6	71.7	1.2

Source: Eurostat NewCronos database

Table 3. Decomposition of the change in earnings inequality according to gender, 1998-2005

		The role of different components in explaining inequality change			
	dMLD	TermA	TermB1	TermB2	TermC
AT	0.040	108%	0%	0%	-8%
DE	0.034	114%	0%	0%	-14%
DK	0.024	92%	1%	0%	7%
ES	-0.081	103%	0%	0%	-3%
FI	-0.081	100%	0%	0%	0%
GR	-0.065	95%	1%	0%	4%
IE	-0.004	(-86%)	(11%)	(-2%)	(178%)
IT	0.011	129%	1%	0%	-30%
LU	0.016	145%	1%	-1%	-45%
PT	-0.008	(87%)	(1%)	(0%)	(12%)
UK	0.024	110%	-2%	1%	-9%

Note: Based on the ECHP (1998) and the EU-SILC (2005). First column shows the absolute change in the MLD index. Second to fifth columns show the results of the decomposition. Component *A* is inequality change due to change in within-group inequalities. Component *B1* denotes inequality change caused by the changing population share of sectors with different level of within-group inequality. Component *B2* is the change in inequality due to changing population share of sectors with different mean incomes. Component *C* denotes inequality change due to changes in group means.

Table 4. Population shares of subgroups by gender

	1998		2005	
	male	female	male	female
AT	65%	35%	65%	35%
DE	66%	34%	66%	34%
DK	58%	42%	59%	41%
ES	68%	32%	65%	35%
FI	55%	45%	55%	45%
GR	65%	35%	62%	38%
IE	64%	36%	63%	37%
IT	63%	37%	63%	37%
LU	70%	30%	71%	29%
PT	56%	44%	55%	45%
UK	62%	38%	61%	39%

Table 5. Relative mean earnings of subgroups by gender

	1998		2005	
	male	female	male	female
AT	1,11	0,80	1,09	0,83
DE	1,09	0,82	1,06	0,88
DK	1,07	0,91	1,08	0,89
ES	1,04	0,92	1,06	0,88
FI	1,10	0,88	1,10	0,88
GR	1,07	0,87	1,06	0,90
IE	1,11	0,81	1,06	0,89
IT	1,08	0,86	1,05	0,91
LU	1,10	0,78	1,06	0,85
PT	1,08	0,90	1,07	0,92
UK	1,12	0,80	1,11	0,82

Table 6. Decomposition of the change in earnings inequality according to age, 1998-2005

		The role of different components in explaining inequality change			
	dMLD	TermA	TermB1	TermB2	TermC
DE	0.034	2%	5%	40%	53%
DK	0.024	84%	5%	6%	6%
ES	-0.081	85%	-2%	1%	16%
FI	-0.081	105%	-3%	-1%	0%
GR	-0.065	95%	-3%	4%	5%
IE	-0.004	303%	-98%	15%	-121%
IT	0.011	59%	17%	-1%	25%
LU	0.016	22%	43%	4%	30%
PT	-0.008	224%	-161%	108%	-71%
UK	0.024	109%	15%	-12%	-12%

Note: See note for Table 3.

Table 7. Population shares of subgroups by age

	1998				2005			
	18-24 y	25-40 y	41-54 y	55+ y	18-24 y	25-40 y	41-54 y	55+ y
AT	12%	48%	33%	7%	12%	39%	39%	10%
DE	4%	47%	35%	14%	10%	37%	42%	12%
DK	4%	42%	40%	13%	5%	37%	39%	19%
ES	6%	50%	36%	8%	6%	50%	35%	10%
FI	2%	40%	48%	10%	3%	37%	43%	17%
GR	6%	50%	37%	7%	4%	50%	36%	10%
IE	15%	50%	27%	7%	13%	42%	33%	12%
IT	6%	49%	38%	8%	5%	44%	40%	11%
LU	7%	55%	32%	6%	5%	46%	39%	10%
PT	14%	49%	29%	8%	6%	49%	35%	10%
UK	11%	44%	35%	10%	9%	42%	36%	13%

Table 8. Relative mean earnings of subgroups by age

	1998				2005			
	18-24 y	25-40 y	41-54 y	55+ y	18-24 y	25-40 y	41-54 y	55+ y
AT	0,61	0,95	1,14	1,39	0,59	0,98	1,09	1,22
DE	0,62	0,93	1,07	1,17	0,36	0,99	1,12	1,12
DK	0,60	0,94	1,08	1,06	0,53	0,97	1,07	1,03
ES	0,59	0,85	1,24	1,21	0,61	0,92	1,12	1,17
FI	0,61	0,95	1,04	1,10	0,63	0,93	1,06	1,06
GR	0,54	0,90	1,21	0,97	0,61	0,88	1,15	1,20
IE	0,62	0,98	1,19	1,22	0,56	0,94	1,20	1,13
IT	0,71	0,93	1,12	1,10	0,64	0,91	1,10	1,19
LU	0,56	0,90	1,17	1,56	0,47	0,85	1,13	1,48
PT	0,61	0,97	1,21	1,06	0,56	0,89	1,16	1,22
UK	0,55	1,02	1,10	1,05	0,58	1,02	1,09	0,98

Table 9. Decomposition of the change in earnings inequality according to education, 1998-2005

		The role of different components in explaining inequality change			
	dMLD	TermA	TermB1	TermB2	TermC
AT	0.041	75%	9%	17%	-1%
DE	0.034	68%	-16%	-21%	69%
DK	0.022	72%	6%	7%	15%
ES	-0.081	68%	-4%	2%	34%
FI	-0.081	104%	2%	0%	-7%
GR	-0.065	84%	2%	1%	14%
IE	-0.004	204%	-74%	-117%	87%
IT	0.011	47%	28%	20%	5%
LU	0.016	68%	0%	0%	32%
PT	-0.008	50%	-52%	-77%	179%
UK	0.024	75%	24%	-27%	27%

Note: See note for Table 3.

Table 10. Population shares of subgroups by education

	1998			2005		
	below upper secondary	upper secondary	tertiary	below upper secondary	upper secondary	tertiary
AT	20%	72%	9%	15%	65%	20%
DE	16%	50%	34%	9%	56%	36%
DK	14%	55%	31%	22%	48%	30%
ES	44%	20%	36%	39%	25%	37%
FI	20%	39%	40%	14%	42%	44%
GR	31%	40%	29%	25%	43%	31%
IE	28%	47%	25%	23%	37%	40%
IT	40%	48%	12%	38%	45%	17%
LU	31%	41%	28%	31%	41%	28%
PT	72%	14%	14%	66%	18%	16%
UK	37%	13%	50%	15%	45%	40%

Table 11. Relative mean earnings of subgroups by education

	1998			2005		
	below upper secondary	upper secondary	tertiary	below upper secondary	upper secondary	tertiary
AT	0,71	1,01	1,58	0,62	0,97	1,38
DE	0,79	0,91	1,23	0,50	0,91	1,26
DK	0,80	0,97	1,15	0,81	0,95	1,22
ES	0,69	0,93	1,41	0,79	0,93	1,27
FI	0,85	0,88	1,20	0,80	0,84	1,21
GR	0,77	0,95	1,32	0,84	0,92	1,24
IE	0,78	0,92	1,40	0,79	0,82	1,29
IT	0,87	1,02	1,35	0,86	0,99	1,35
LU	0,73	0,94	1,40	0,69	0,94	1,41
PT	0,75	1,10	2,18	0,74	1,09	1,96
UK	0,79	0,91	1,18	0,76	0,88	1,22

Table 12. Percentage of people aged 18-59, living in jobless households

	2002	2003	2004	2005	2006
AT			14.5	13.9	12.4
BE	19.4	18.9	18.4	18.0	18.4
CY	8.0	7.9	7.7	7.7	7.8
CZ	11.6	12.1	12.8	12.3	12.1
DE	16.5	16.8	17.0	16.0	14.9
EE	13.9	13.8	13.2	11.2	9.5
ES	9.3	9.1	9.3	8.7	8.2
FI		16.2	16.0	14.9	14.0
FR		15.8	15.9	15.9	16.6
GR	13.4	13.1	13.3	13.4	13.0
HU	18.3	16.7	17.1	17.1	16.7
IT			12.8	13.3	13.1
LT	12.0	10.4	11.4	9.5	9.9
LU	11.2	11.9	11.3	11.1	11.3
LV	14.3	12.6	11.5	11.4	9.5
MT		10.6	11.2	11.1	10.6
NL	11.6	12.6	12.8	12.8	12.9
PL		17.8	18.9	18.1	16.4
PT	6.6	7.3	7.3	7.6	7.9
SI	12.5	13.8	12.4	11.0	11.3
SK		13.7	14.6	13.7	13.1
UK	14.4	14.1	13.9	13.9	13.7

Note: source LFS, no data for Denmark, Sweden and Ireland