

# **Components of income inequality and its change in EU countries, 2004-2010**

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## **ABSTRACT**

This paper aims to assess the contribution of different income sources and population characteristics to income inequality and its change during the 2004-2010 period in EU Member States. The analysis uses EU-SILC data to study the components of income inequality and its change both during years of economic growth (2004-2007) and during years of economic slowdown (2007-2010). The study analyses the contribution of different income sources by using the Shorrocks decomposition method and the role of different population characteristics using a regression-based method. The analysis shows that between 2004 and 2007 inequality of market income declined, most importantly in countries with important gains in employment, while between 2007 and 2010 market income inequality was rising in the majority of the countries. During the years of economic growth inequality of disposable income was also on the decline in most of the countries, while during the crisis years it increased more moderately pointing to an important redistributive effect of government taxes and transfers. Market income had an inequality increasing effect during the 2007-2010 period in Denmark, Cyprus, France and the UK, but in most of these countries (except France) government taxes and transfers moderated this effect. During the years of economic growth Poland and Estonia experienced the largest fall in inequality of disposable income. Changes in income differences by levels of work intensity contributed to inequality decline in both countries. The role of education level proved to be different however, having an inequality decreasing effect in Estonia and an inequality increasing effect in Poland. Between 2007 and 2010, the largest increases in inequality of disposable income were found in Ireland, Spain and Slovakia. In the case of Spain and Ireland the variables studied in the analysis did not contribute to explain this increase, while in the case of Slovakia almost the entire increase in inequality is the result of the inequality increasing effect of increasing income differences by levels of household work intensity.

**JEL Classification:** D31, D33, D60, H20

**Keywords:** inequality, decomposition, income sources, population subgroups, EU-SILC

# 1 INTRODUCTION

The concern here is to assess the contribution of different income sources and population characteristics to income inequality during the 2004-2010 period in EU Member States. The way in which income is distributed in the society and the evolution of the income distribution over time is the result of a complex set of processes, involving various demographic and economic factors and their interaction with the social welfare system in place. As the study covers a relatively short time span, it will be less able to demonstrate the role of such long-term forces as changes in age composition, household composition or change in industrial structure and the structure of employment. But as the period studied is of considerable macroeconomic volatility we expect to analyze the contribution of labour market changes and of government redistribution to the evolution of income inequality.

The first part of this period was characterised by steady economic growth in most EU countries, employment rates increased in many countries and wages were also on the rise. This period of prosperity was halted by the economic crisis in 2008-2009. The crisis impacted on household incomes and well-being via multiple channels: incomes from labour market were affected by employment loss and wage decline, capital incomes were affected by the stock market crash, while government austerity measures increased taxes and decreased social transfers.

As a result of the crisis employment declined in many countries. Decreasing employment affects the income distribution in various ways. First of all, declining employment increases inequality of labour earnings between those working and not working (Jenkins et al. 2011). A decline in employment might also modify inequality among the employed. Decreasing employment might change the composition of the employed population, which modifies the distribution of labour income among those in employment. If those losing employment are in the lower or upper tails of the earnings distribution, inequality of earnings among the employed might decline. On the other hand, if employment is lost in the middle of the distribution, the earnings distribution might become more polarized, and inequality might also increase. Of course, countries differ to a great extent in their labour market adjustment to the recession. In some countries the fall in employment mainly manifested in increasing unemployment but in others reduction of working hours and increasing part-time employment was also widespread (Vaughan-Whitehead 2012). In these countries a more moderate impact can be expected on the distribution of household incomes (Jenkins et al. 2011). In other countries labour market adjustment also brought about a decline in wages, while employment has changed to a lesser extent. This obviously has different distributional implications than adjustment via unemployment. To assess the effect of changing employment on household income, one has to consider how employment and earnings of individuals are combined in households. The effect of an increase in employment on household earnings inequality will be different if someone living in a jobless household gets a job or if the wife of a full-time working man enters into employment.

Several comparative studies exist on the relationship between labour market changes and the distribution of household income. Burniaux et al. (2006) have shown that during the 1990s falling unemployment was associated with diminishing income inequality. In most of the countries where unemployment declined after 1993-94, income inequality also declined, an increase in inequality among wage-earners being offset by more people being in work. A series of papers have studied why increasing employment during the growth period preceding the crisis did not lead to a decline in poverty rates. Cantillon (2011) put forward the hypothesis that an increased polarisation of the distribution of jobs among households could be the reason for the persistence of poverty rates. Subsequent research has shown however that changes in the share of jobless households did not

explain much in the changes in national at-risk-of-poverty rates during the economic upswing (Corluy and Vandenbroucke 2012).

Other studies focus on the distributive effects of increasing employment among women. Pasqua (2008) finds that income differences by household employment status contribute the most to total inequality in Southern European countries (Italy, Spain and Greece). This study however does not consider the contribution of labour market changes to the evolution of inequality. The OECD (2011) provides a detailed comparative analysis on the determinants of increasing household earnings inequality in OECD member states during the 1985-2005 period. The authors use decomposition analysis to study the role of labour market factors (increasing wage inequality or increasing female employment) and demographic evolutions (increasing assortative mating or changing household structure). The study shows that the increase in women's employment had an equalising effect on the distribution of household earnings in all countries, but the main factor driving the increase in household gross earnings was the rise in gross earnings disparities (contributing between one-third and one-half to the overall increase).

There are number of comparative studies on the role of taxes and government spending in shaping the income distribution. For example OECD (2011) compares the redistributive effect of taxes and transfers among OECD member states based on survey data from the Luxembourg Income Study. The study uses the difference between the Gini values for market incomes and disposable incomes as a measure of the overall redistributive effect. The study concludes that between the mid-1980s and the mid-1990s, redistribution systems compensated nearly three quarters of the increase in market-income inequality, but government redistribution became less effective at offsetting growing inequalities during the following decade. Other studies use data from microsimulation models to compare redistributive effect of taxes and transfers in EU countries. Static microsimulation models are based on survey data on household gross market income and apply current legislation to simulate taxes households are liable to pay and social transfers they are entitled to. Paulus et al. (2009) study the redistributive effect of tax and transfer systems based on the EUROMOD microsimulation model. The study shows that around 2005 the total redistributive contribution of taxes and benefits in absolute terms was largest in Hungary and Belgium, and smallest in the Netherlands, Portugal, Italy and Ireland.

Decomposition methods were also used to study the contribution of different income types to total inequality. Fuest et al (2010) use the Shorrocks decomposition method to compare the redistributive effect of taxes, social contributions, transfers and pensions in EU countries based on data from EU-SILC 2007. The study shows that redistributive effect of taxes and transfers are different along the categories of Esping-Andersen's welfare state typology. They also show that Eastern European countries do not form a separate group but Central European countries are close to Western Europe, while the Baltic states resemble the Southern European countries. The study also shows that results from the Shorrocks decomposition are different from those obtained by the standard accounting approach.

Government taxes and transfers are expected to mitigate the effect of the economic crisis on household incomes. Unemployment benefits or social assistance are important means to moderate the adverse effect of recession on households. During the early years of the crisis government spending was increasing due to automatic stabilizers such as unemployment benefits but also because of stimulus packages that were introduced by states to encourage economic growth. Increased government spending coupled with declining tax receipts boosted deficits and pushed governments to adopt fiscal consolidation measures. Some of these measures, such as decreasing benefits/pensions, increasing income taxes/SiCs or public sector wage cuts also affect household incomes. Avram et al. (2013) investigates the distributional effects of fiscal consolidation measures in nine EU countries using the EUROMOD microsimulation model. The analysis shows that overall these

measures are progressive, ie. richer income groups contributing more in relative terms in six of the nine countries (Greece, Spain, Latvia, Italy, Romania and the UK). In Lithuania and Portugal middle income groups contribute less compared to low and high income groups. Estonia is the only country with a clearly regressive distribution of income cuts.

This analysis considers components of income inequality change during the period of growth and recession between 2004 and 2010. It considers the consequence of labour market changes on inequality of household income complementing the literature that has been focusing on the relationship between household joblessness and poverty so far (de Graaf-Zijl and Nolan 2011). It also compares the role of market income and government redistribution in shaping overall income inequalities using survey data for EU member countries.

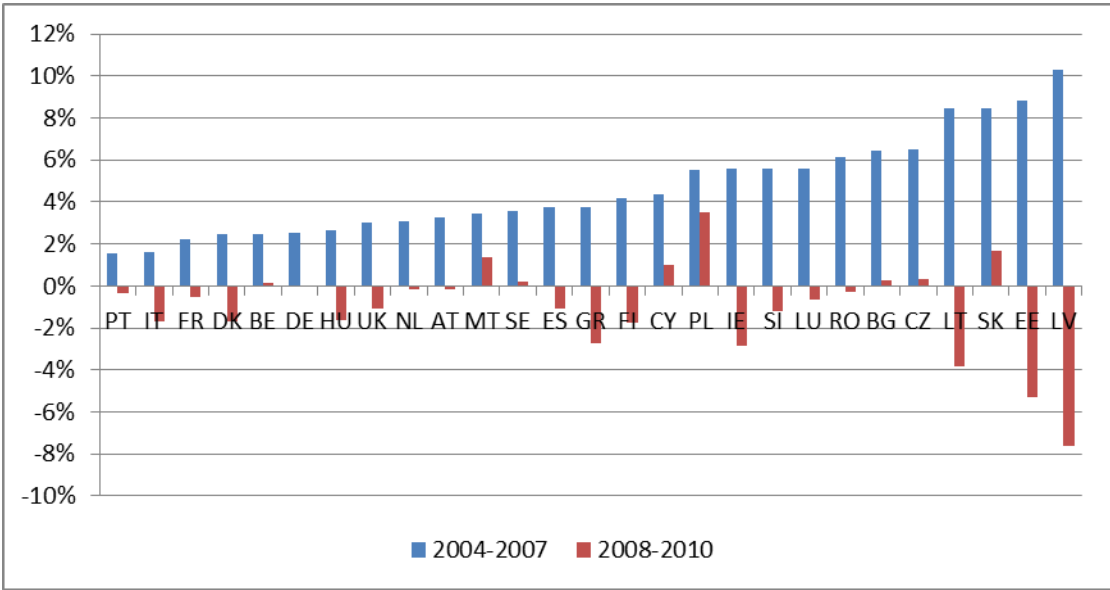
In the following analysis after describing macroeconomic changes during the 2004-2010 period (section 2) and the methodology of the decomposition analysis (section 3) we study components of income inequality and its change during the first years of the economic crisis. Components of income inequality will be studied from two perspectives by decomposition methods. In section 4.1 we decompose income inequality into contributions of different income sources. The aim is to see how labour income of different household members or capital income account for the level and change of market income inequality and how government transfers and taxes modify the income distribution. Then in section 4.2 we study the contribution of different population characteristics to income inequality. The aim here is to examine the extent to which inequality in the distribution of income is a result, on the one hand, of differences in the income of households with different compositions (in terms of household structure, work intensity and the age and education level of the household head) and, on the other hand, of differences in income between households with similar characteristics.

## **2 BUSINESS CYCLE AND INCOME INEQUALITY BETWEEN 2004 AND 2010**

The period studied can be divided in two subperiods: the first subperiod are the years before the crisis which were characterised by steady growth in almost all EU countries, while the second period, after the crisis hit in 2008-2009, was characterised by declining economic activity in many of the Member States. As the following figure shows, growth rates are significantly lower during the 2007-2010 subperiod, than during the 2004-2007 period. Economic activity seems to be especially volatile in the Baltic States: after growth rates exceeding 8% a year during 2004-2007 period, the crisis years brought about a 4-8% decline of GDP per year. Other countries with declining GDP over the 2007-2010 period include Ireland and Greece, where GDP declined by more than 2% per year. In Italy, Denmark, Finland, Hungary, the UK and Slovenia the decline of GDP was between 1% and 2% per year on average. Poland and Slovakia are the only countries with significant economic growth in both periods.



**FIGURE 1: GDP GROWTH RATES IN EU MEMBER STATES, 2004-2010 (AVERAGE YEARLY GROWTH RATE OVER THE PERIOD)**



Source: Eurostat Database

**2.1 LABOUR MARKET CHANGES**

The most important labour market changes that affect the income distribution are changes in the distribution of employment between individuals and households and also changes in the distribution of earnings from employment among those in work.

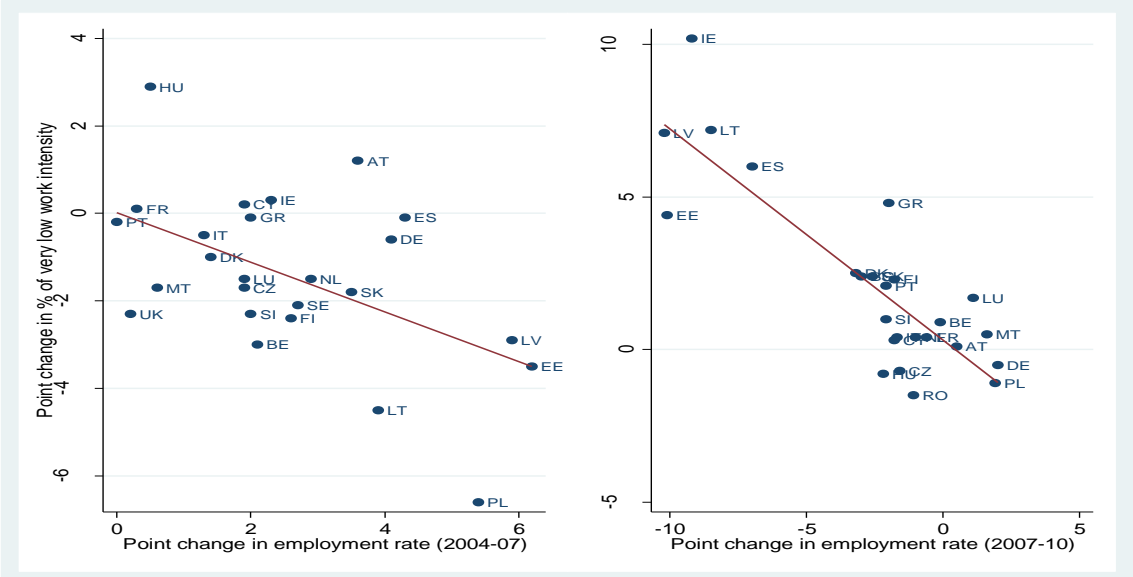
During the 2004-2008 period, the employment rate increased by 3 percentage points in the EU (from 63% to 66%) among members of the 15-64 age group. Characteristics of employment growth were increasing female participation, rising shares of part-time and fixed-term employment and increasing participation of older people aged 55-64. Countries differed of course in the evolution of the employment rate. The most important increase in employment rate has been observed in EU12 states Bulgaria (+8 points), Estonia, Latvia and Poland (+5-6 points), but EU15 countries Germany or Spain also showed a significant increase in total employment rate.

To assess the effect of a change in employment on household income, one has to consider how employment is distributed among households, which is described by the concept of household work intensity. This indicator measures the ratio between the number of months spent in employment during the year by household members of working age (i.e. those aged 18-59) and the number of months they could potentially spend in work, if they were all employed. Overall, increasing employment contributed to a decline of the proportion living in households with very low work intensity, defined as having work intensity below 0.2 (see left panel of Figure 2). The percentage of individuals living in households with very low work intensity declined the most in Poland (-7 points), Lithuania (-5 points) and Estonia (-4 points). The economic crisis put an end to this favourable trend: during the 2009 recession year employment rates were falling in many of the EU countries. Drastic fall in employment was seen in Spain, Ireland and the Baltic states, but most other member states suffered some decline in the employment rate, with the exception of Germany, Poland and Austria.

Falling employment was more severe in case of men, the young active age (those between 15 and 24 years of age), the low-skilled and those in temporary employment (OECD 2010).

As Figure 2 (right panel) shows, countries that suffered important losses in employment during the crisis years have seen the percentage of those living in work-poor household increasing to a great extent. There are differences between the countries concerned, however. In Ireland a percentage point decline in the employment rate translated on average into more than a percentage point increase in the share of those living in very low work intensity households. On the other hand, Estonia also experienced a ten-point decline in the employment rate, while the percentage of those living in work-poor households increased only by less than 5 points. Based on data from the Eurostat, in 2011 the percentage of those between 18-59 years living in low work intensity households was the lowest in Cyprus, the Czech Republic, Luxembourg and Sweden (below or around 7%). Highest percentage was detected by far in Ireland, where 23% of the 18-59 age group lives in low work intensity households.

**FIGURE 2: CHANGE IN EMPLOYMENT RATE (20-64 YEARS) AND CHANGE IN THE PROPORTION OF THOSE LIVING IN VERY LOW WORK-INTENSITY HOUSEHOLDS (18-59 YEAR OLDS), 2004-2007 (LEFT PANEL) AND 2007-2010 (RIGHT PANEL)**



Source: data from Eurostat database

As changes in the distribution of earnings are concerned, data from the OECD suggest (see Table A1 in the Appendix) that in most of the countries inequality indicators were more or less stable in both the growth and the crisis periods, important changes occurred only in a small number of countries. In the first subperiod, between 2004 and 2007, earnings inequality was rising in Demark and Germany, while Hungary and Italy have seen their earnings distribution becoming less dispersed. Between 2007 and 2010 earnings inequality increased in Italy and Slovakia, while earnings dispersion declined in Poland.

## 2.2 HOUSEHOLD INCOME INEQUALITY: LEVELS AND CHANGES 2004-2010

In 2010 the level of inequality before government redistribution –measured as inequality of gross equivalent market income<sup>1</sup>– was greatest in Ireland, where the Gini index equalled 0.59 and the UK, where it amounted to 0.55 (see Table A2 in the Appendix). Five other countries recorded Gini values over 0.52 (see Table A2 of the Appendix). Market income inequality was the lowest in Cyprus, Slovakia and Sweden, where the Gini was around 0.45, and was only a little higher in the Czech Republic, Slovenia and the Netherlands (Gini values around 0.46). As Table A3 of the Appendix shows, inequality after government redistribution, measured by the value of the Gini coefficient of equivalised household disposable income ranged from 0.24 (in Slovenia) to 0.35 (in Bulgaria and Latvia) in 2010. Other countries at the top of the ranking according to the Gini coefficient are Portugal (Gini index around 0.34) together with Romania, Ireland and Greece. At the lower end of the country ranking Sweden, the Netherlands and the Czech Republic have Gini coefficients that are only slightly higher than Slovenia's (between 0.24 and 0.25). Other countries can be broadly divided into two groups, with Southern European countries, the Anglo-Saxon countries and some EU12 countries (Baltic states, Poland, Romania and Bulgaria) having Gini values between 0.31 and 0.34, and other EU15 countries having values of between 0.25 and 0.30.

Figure 3 and Figure 4 describe how income inequality has changed over the period studied. The figures show the change in the Gini index of inequality of disposable income and of market income with and without the inclusion of zero market income earners. The distribution of market income with the inclusion of zero incomes is sensitive both to changes in the percentage of those having no market incomes and the dispersion of positive market incomes<sup>2</sup>.

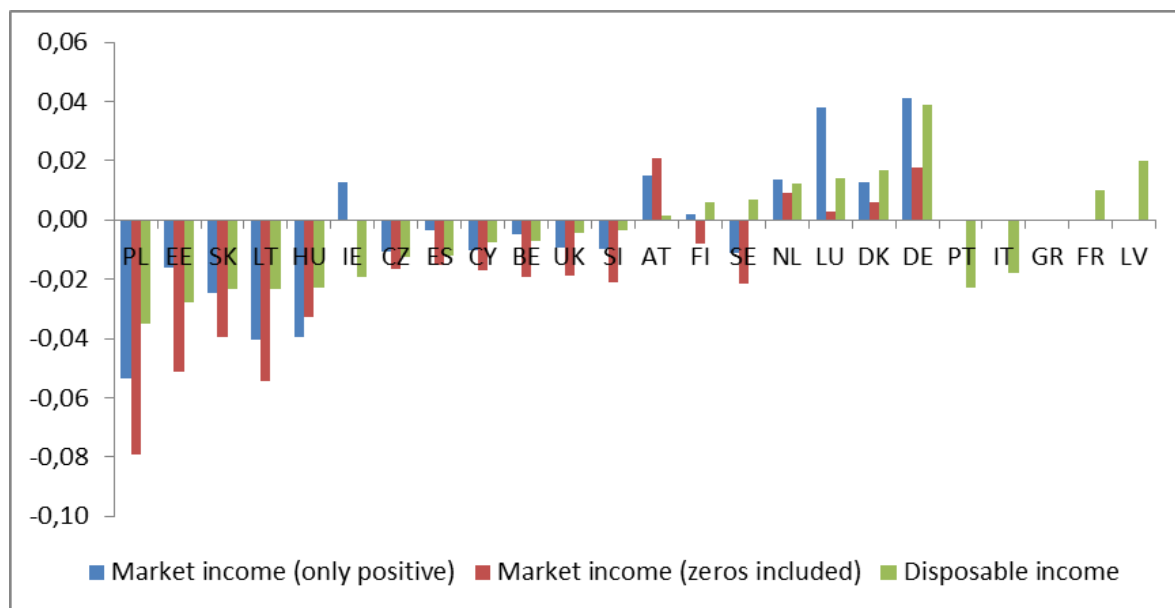
Figure 3 shows trends in income inequality between 2004 and 2007. It can be seen, that between 2004 and 2007 inequality of market income declined in most countries for which data is available. In Poland the Gini index of market income inequality (zero incomes included) declined by 0.08, in Estonia and Lithuania by around 0.05. This is not independent from labour market changes: as it was explained above, Poland and the Baltic states were precisely the countries, where employment rates increased the most during these years. In countries like Austria, Germany on the other hand inequality of market incomes increased. The change in inequality of disposable income was more moderate in most countries. The biggest decline occurred in Poland and Estonia, where the Gini index declined by more than 0.02, while in the case of Germany an increase of 0.04 has been observed.

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<sup>1</sup> For a detailed description of income concepts see Section 3.3.

<sup>2</sup> If the percentage of those having positive income is  $p$ , and the Gini index of the distribution of positive incomes is  $G_+$ , then the Gini index of the entire distribution (including those with zero income)  $G=(1-p)+p \cdot G_+$  (Brandolini and Smeeding 2011). See details of the components in Table A2 of the Appendix.

**FIGURE 3: POINT CHANGE IN THE GINI INDEX OF GROSS MARKET INCOME INEQUALITY AND INEQUALITY IN DISPOSABLE INCOME, 2004-2007**



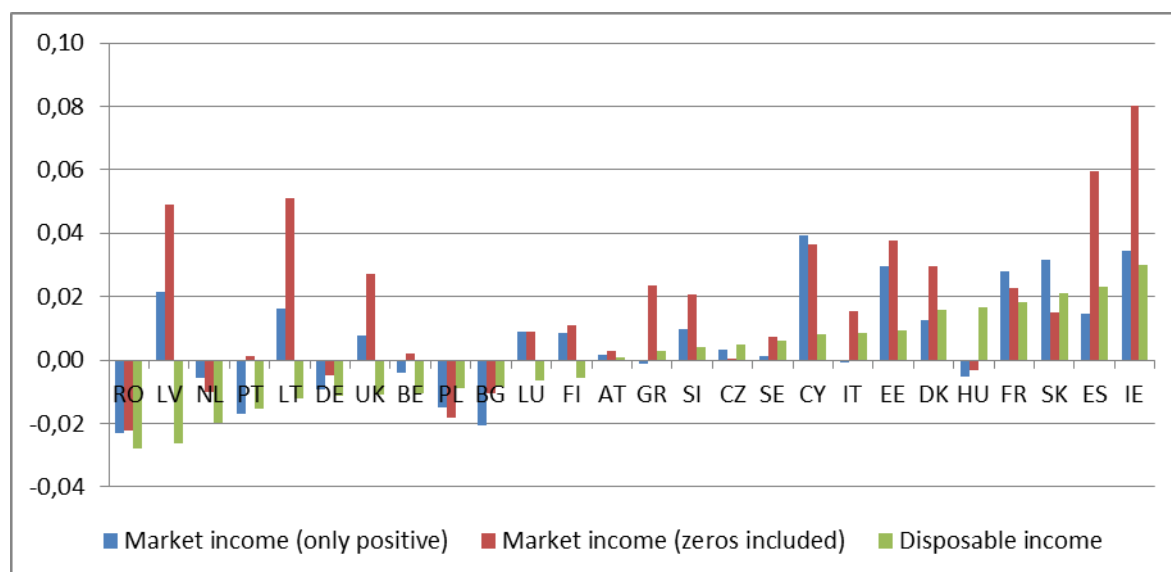
Note: both market income and disposable income were equivalised (see Section 3.3.)

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

Figure 4 shows results for the period between 2007 and 2010. Contrary to the previous period, market income inequality was rising in the majority of the countries. Most important increase in market income inequality (zeros included) occurred in those countries, where the decline in employment was the most important. The biggest increase in market income inequality was recorded in Ireland, where the Gini index of gross market income inequality increased by 0.08 points, and Spain, where a 0.06 increase was recorded. Market income inequality also increased in Latvia and Lithuania, where a 0.05 rise in the Gini index was observed and Cyprus and Estonia where the Gini increased by 0.04. Market income inequality declined during this period in Poland and Romania (by 0.02).

In most countries inequality in disposable household income changed less than inequality in market incomes. Inequality of disposable income increased the most in Ireland (+0.03) and Spain (+0.02). Inequality of disposable income declined in approximately half of the countries, despite market income inequality increased in the majority of the countries. Most important declines were observed in Latvia and Romania (-2 points).

**FIGURE 4: POINT CHANGE IN THE GINI INDEX OF GROSS MARKET INCOME INEQUALITY AND INEQUALITY IN DISPOSABLE INCOME, 2007-2010**



Note: both market income and disposable income were equivalised (see Section 3.3.)

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

The comparison of market income inequality and inequality of disposable income is often used to quantify the overall redistributive effect of government taxes and transfers. Here we calculate the percentage reduction in inequality when going from inequality of gross market income to disposable income. During the 2007-2010 period, largest increases are seen in countries with substantial decline in employment during the crisis years, like Latvia, Lithuania, Ireland and the UK (see Figure A1 of the Appendix). According to this comparison the redistributive effect of government taxes and transfers has been declining during this period in countries like Sweden, France, Poland and Germany.

### 3 METHODOLOGY OF DECOMPOSITION ANALYSIS AND DATA CHARACTERISTICS

This section outlines the methodology of the analysis. In section 3.1 the methodology of decomposition by income sources is detailed, while section 3.2 describes the method used to decompose inequality and its evolution by population characteristics. Finally in section 3.3 the data used in the analysis will be described.

#### 3.1 DECOMPOSITION OF INCOME INEQUALITY BY INCOME SOURCES

Factor source decompositions are means to study how different types of incomes contribute to the formation of inequalities. In general let us assume, that disposable income of an individual consists of  $K$  income components, and the income from source  $k$  ( $k=1, \dots, K$ ) for individual  $i$  ( $i=1, \dots, n$ ) is  $Y_{ik}$ . The distribution of incomes from source  $k$  is  $Y_k=(Y_{1k}, Y_{2k}, \dots, Y_{nk})$ , and the distribution of total incomes is

$Y=(Y_1, Y_2, \dots, Y_n)$ , where the total income for individual  $i$  is:  $Y_i = \sum_k Y_{ik}$ . Shorrocks (1982) proposed the following formula to express the proportional contribution of a given income source  $k$  to total inequality:

$$s_k = \text{cov}(Y_k, Y) / \text{var}(Y) = \rho(CV_{Y_k} / CV_Y)(\mu_k / \mu)$$

Where *cov* is covariance and *var* variance, *CV* is coefficient of variation,  $\mu_k$  is the mean of the given income component,  $\mu$  is the overall mean and  $\rho$  is correlation coefficient between  $Y_k$  and  $Y$ .

As Shorrocks (1982) elaborates, this decomposition rule is invariant to the choice of inequality index and it satisfies several important axioms. The first is symmetry: contributions of different components to total inequality do not depend on the order of inclusion of income components. This means that any permutation of the components will give the same decomposition. The decomposition is also independent of the level of aggregation. The contribution to the total inequality of factor  $k$  is the same if other factors are treated separately or are aggregated. The third property is that of consistency, meaning that contributions of different factors sum to total inequality. Shorrocks demonstrates that this is not the only possible way of decomposition, which satisfies the above listed properties. He proposes an additional property to reduce the set of possible decomposition rules to the above mentioned decomposition, namely that equally distributed income sources should have a zero contribution to total inequality. This property is somewhat controversial, eg. according to another method frequently used for assessing contributions to inequality, the sequential accounting approach (see Whiteford 2008 or Fuest et al. 2010) an equally distributed income source has an inequality-reducing effect. Nevertheless, the Shorrocks-decomposition is frequently used to assess the role of different income sources in the formation of inequality (eg. Jenkins 1995, Jantti 1997, Fuest et al. 2010).

We can also ask whether there are differences in the contribution of the various income components to the change in overall inequalities. Results of decompositions of inequality change are not invariant to the choice of inequality index, thus one has to select a specific inequality measure. The Gini coefficient will be used throughout the analysis, which is probably the most widely used measure of income inequality. The maximum possible value of the Gini coefficient is 1, when one individual has all the income in a country and the lowest value is 0, when everyone has equal income. One advantage of the Gini index is that it is more robust to changes in the tails of the income distribution than other indices, such as the coefficient of variation for example. Here we decompose the percentage change in total inequality as measured by the Gini coefficient in  $k$  terms using the following formula. Let  $S_k$  be the  $k$  factor's absolute contribution to the level of a given inequality index ( $I$ ), where  $S_k = s_k * I$  and  $I = \sum S_k$ . The change in inequality as measured by index  $I$  can be expressed as the sum of absolute contributions to change  $\Delta S_k$  and the proportional contribution to inequality change of component  $k$  is equal to  $\Delta S_k / \Delta I$ . As proportional contributions can be misleading when overall inequality change is small, we use absolute contributions to describe the role of income sources in changing inequality.

### 3.2 DECOMPOSITION OF INCOME INEQUALITY BY POPULATION SUBGROUPS

A decomposition by population subgroups studies what fraction of total inequality is due to differences between average incomes of different subgroups of the society (by gender, race or education for example), and what fraction is due to income dispersion within groups. The approach followed here is a multivariate decomposition based on Cowell and Fiorio (2009), which in turn is based on the results obtained by Shorrocks (1982) and Fields (2003). The contribution of the characteristics of households (age, education level, household composition and work intensity) to income inequality is estimated via a multivariate regression analysis. This indicates the effect of each

factor, given the values of the three other factors. The starting point of the analysis is a regression model of incomes of the form:

$$Y_i = \sum b_k X_k + \varepsilon_i$$

The formula used to measure the proportionate contribution of the composite variable  $C_k = b_k X_k$  to overall inequality is again  $cov(C_k, Y)/var(Y)$ , where  $b_k$  is the estimated regression coefficient for variable  $k$ ,  $X_k$  is the value of the  $k$ -th explanatory variable.

This formula estimates the total contribution of a characteristic, which is composite of the difference between the average incomes of those with the characteristics in question relative to overall average income (the regression coefficients) and the share of those with the given characteristic in the population. The advantage of the regression-based decomposition over univariate decomposition methods is that the contributions of the variables included in the analysis - together with the residual - sum to total inequality.

### 3.3 DATA USED IN THE ANALYSIS

The analysis here is mostly based on the microdata from user databases of the EU-SILC 2005, 2008 and 2011. In some cases other years of the study were also used. Data on Ireland is not yet available in the EU-SILC 2011 UDB, which is the most recent database released to the research community, that is why data from EU-SILC 2010 UDB will be used. These data cover 27 Member States in the latter two years of the study, but data for Bulgaria and Romania is not available in EU-SILC 2005.

EU-SILC is an output harmonised data collection, which is built on a common framework of concepts, procedures and classifications but in the same time allowing national statistics offices a certain degree of discretion to implement the guidelines. As a result considerable differences remain between participating countries in terms of sample design, data collection and post-collection processing (e.g. Wolff et al., 2010). The framework allows to base many income variables on administrative data rather than on survey data and in some countries (Nordic countries, the Netherlands and Slovenia) income data and some demographic information is obtained from administrative registers. This difference might affect comparability especially for income types which are more susceptible to recall bias, such as capital incomes.

The population surveyed is confined to those living in private households. The two most important income concepts are that of annual gross market income and total disposable household income. Gross market income includes all household income before the inclusion of government transfers and the deduction of direct taxes: earnings from employment, self-employment income and capital income, which includes in rents, dividends, interest and private transfers. For some countries (Spain, France, Greece, Italy, Portugal, Latvia) information of gross incomes is not available in EU-SILC 2005. In case of Spain data from EU-SILC 2006 will be used in replacement, while for other countries this year is omitted from the analysis. Disposable income is calculated as gross market income plus social transfers and minus direct taxes and social contributions. The income reference year is the calendar year prior to the year of study, that is, in the case of the 2011 survey, income relates to the 2010 calendar year (except for Ireland and the UK, where it is the 12 months prior to the date of the interview). For more details on the EU-SILC survey see Decanq et al. (2013).

The income of all household members is aggregated and total household market or disposable income is equivalised for differences in household size and composition, using the so-called modified OECD scale (which assigns a value of 1 to the first adult in the household, 0.5 to additional members of age of 14 and older, and 0.3 to children under 14). Equivalised income so calculated is then

assigned to each household member. The inequality indices reported here are estimated on the basis of these equivalised figures.

Cases where income is negative have been excluded from the analysis. Negative incomes may result either from the way that the income of the self-employed is defined - i.e. in terms of net trading profits - or from taxes exceeding income in the year. In the analysis of market incomes adjustment for 'outliers' (i.e. extreme levels of reported income), a bottom and top coding procedure (or 'winsorising') has been undertaken (Van Kerm 2007). Specifically, any income value at the bottom of the ranking that is less than the value at the 0.1 percentile is replaced with the value of that percentile; meanwhile income values at the top of the ranking that are greater than the 99.5 percentile are replaced with the value of that percentile.

## **4 RESULTS**

### **4.1 DECOMPOSITION OF INCOME INEQUALITY BY INCOME SOURCES**

Here we decompose inequality of disposable household income by income sources. We differentiate between four types of incomes: market income, pensions, other government transfers (including unemployment benefits, family and child benefits, poverty relief etc.) and direct taxes.

#### ***4.1.1 DECOMPOSITION OF THE LEVEL OF INEQUALITY BY INCOME SOURCES***

Figure 5 shows the result of the decomposition of the level of inequality in disposable income in 2010, while results for other years are given in Table A4 in the Appendix. Market income is the most important contributor to total inequality in all countries, with contributions ranging from 66% (Slovakia) to 177% (Netherlands). Pension income also has a positive contribution to inequality of disposable income in most countries, the only exceptions are the Czech Republic, Estonia and Denmark. The highest proportional contribution was recorded in Slovakia, where pensions account for 43% of inequality of disposable income, but in the majority of countries the contribution of pensions is below 20%.



**FIGURE 5: PROPORTIONAL CONTRIBUTION OF INCOME SOURCES TO INEQUALITY OF EQUIVALENT HOUSEHOLD DISPOSABLE INCOME, YEAR 2010**



Source: own calculation from EU-SILC 2011 UDB, with the exception of Ireland where data come from EU-SILC 2010 UDB.

Government transfers (other than pensions) have an inequality reducing effect in a majority of countries. In the Netherlands, Sweden, Finland transfers reduce income inequality by 7-8% points. In some countries even this income source contributes positively to inequality of incomes. In Latvia, Lithuania or Estonia, government transfers account for 4-7% of inequality. Direct taxes have a strong inequality reducing effect in most of the countries. In the Netherlands for example direct taxes reduce income inequality by 88% points, but also in the UK, Denmark and Slovenia, direct taxes reduce inequality by more than 60%. The lowest inequality reducing effect was seen in the case of Slovakia and Belgium where direct taxes decrease inequality by only 10-14% points.

#### 4.1.2 DECOMPOSITION OF THE CHANGE IN INEQUALITY BY INCOME SOURCES

Results on the decomposition of change in inequality of disposable income are summarised in Table A5 and A6 of the Appendix. During the period 2004-2007 market income had a strongly inequality increasing effect in Finland, Belgium, Netherlands, Austria and Germany, however total inequality increased only in Germany, and to some extent in the Netherlands, while in the other three countries the change in overall inequality was minimal. In case of Finland and Belgium direct taxes moderated the inequality increasing effect of market income, while in Austria the inequality reducing effect of pensions and direct taxes cancelled out the effect of market income. In Denmark, Hungary, Cyprus, Lithuania and Estonia market income had an inequality reducing effect, which -albeit moderated by other income types- resulted in declining overall inequality in Hungary, Lithuania and Estonia. In the case of Denmark the inequality increasing effect of direct taxes was stronger than the inequality reducing effect of market income, which resulted in a small increase of inequality overall.

Exactly the opposite of this has happened in Denmark during the 2007-2010 period: market income had a strongly inequality increasing effect but it was moderated by direct taxes, so at the end only small increase in overall inequality has happened. Market income had an inequality increasing effect during this period also in Cyprus, France and the UK, but only in France do we see an increase in the

Gini index of total income. In the UK the inequality reducing effect of direct taxes was sufficient to reverse the tendency and this resulted in a small decline in overall inequality. In Slovakia, Belgium and Romania market income had a strong inequality-reducing effect. In the case of Slovakia this was counterbalanced by pensions and to a lesser extent direct taxes, and the country ended up with a small increase in inequality. In Belgium the inequality increasing effect of direct taxes almost counterbalanced the effect of market income, the result being a small decline in the overall Gini index. In case of Romania pensions moderated the effect of market income to some extent, but the overall Gini index declined to significant extent.

From the comparison of results of these results and the simple comparison of market income inequality and disposable income inequality (see Figure A1) it is obvious that the two methods give different results. For example in case of Lithuania, we have seen that inequality of market income has increased between 2007 and 2010, but inequality of disposable income has not increased which points to an increase in the redistributive role of government taxes and transfers. In fact, in 2007 taxes and transfers reduce the Gini index by 30%, while in 2010, they achieve a 39% reduction in the Gini index. The results of the Shorrocks decomposition show a different picture: market incomes have an inequality reducing effect in Lithuania between 2007 and 2010, while social transfers increase inequality. When comparing these results it has to be remembered that in the Shorrocks decomposition the contribution of a given income type to total inequality does not only depend on inequality of the given income source but also on its share in total income, and its correlation with total income. So even if inequality of market income increased in Lithuania, the declining share of market income and the weakening correlation with total income results in a lower absolute contribution to total inequality in 2010 than in 2007.

## **4.2 DECOMPOSITION OF INCOME INEQUALITY BY POPULATION SUBGROUPS**

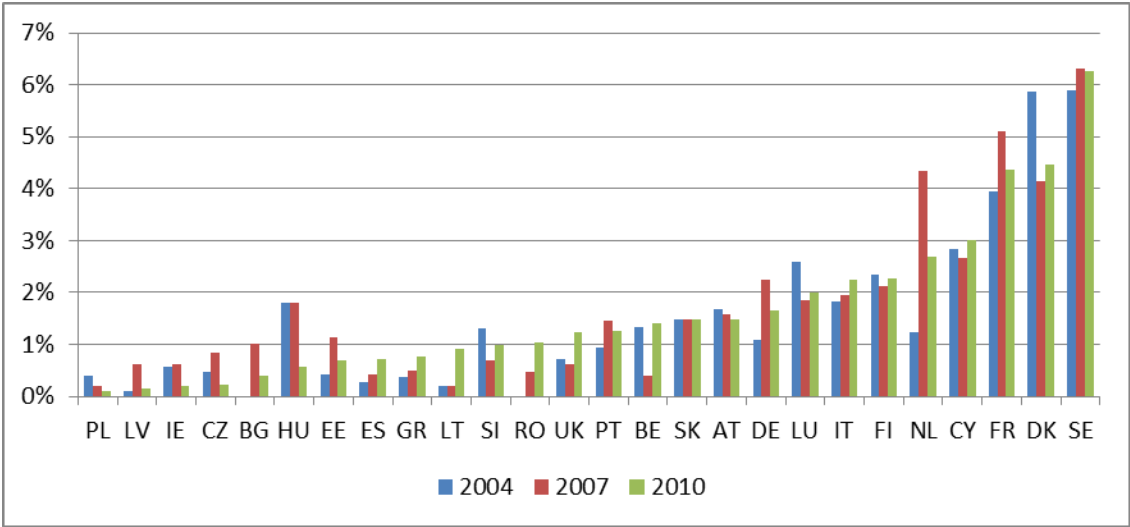
When studying the role of income differences between population subgroups on income inequality we select grouping variables that are relevant for employment incomes, since this is the most important source of income for most households. Household income from employment depends above all on the extent to which household members are in work and, if they are, on whether they work full time or part time. It also depends on factors related to the distribution of wages, such as education level or age (which is related to labour market experience). In addition to factors related to income from employment, the importance of household structure also has to be considered. Demographic characteristics of the household - such as whether household members are over retirement age, or whether there are dependent children in the household - also affect household income. Based on this, we define grouping variables on the level of household: age of household head, household structure, education level of household head and work intensity of the household. The household head is defined on a demographic basis: it is taken to be the oldest man of working age (16-64 years old) in the household. If there is no such household member, the oldest working age woman is considered as the household head. If no working age persons live in the household the oldest man is considered as the household head, if no men live in the household, then the oldest woman is taken as the household head. As described in section 3.2. the contributions of different characteristics reported here represent the contribution of the composite variable, which is the product of the regression coefficient and the population share of those with the given characteristic.

### **4.2.1 DECOMPOSITION OF THE LEVEL OF INEQUALITY BY POPULATION SUBGROUPS**

To examine the effect of age on the distribution of income, households were divided into four groups according to the age of the household head: young working age (18-35), mid working age (36-49),

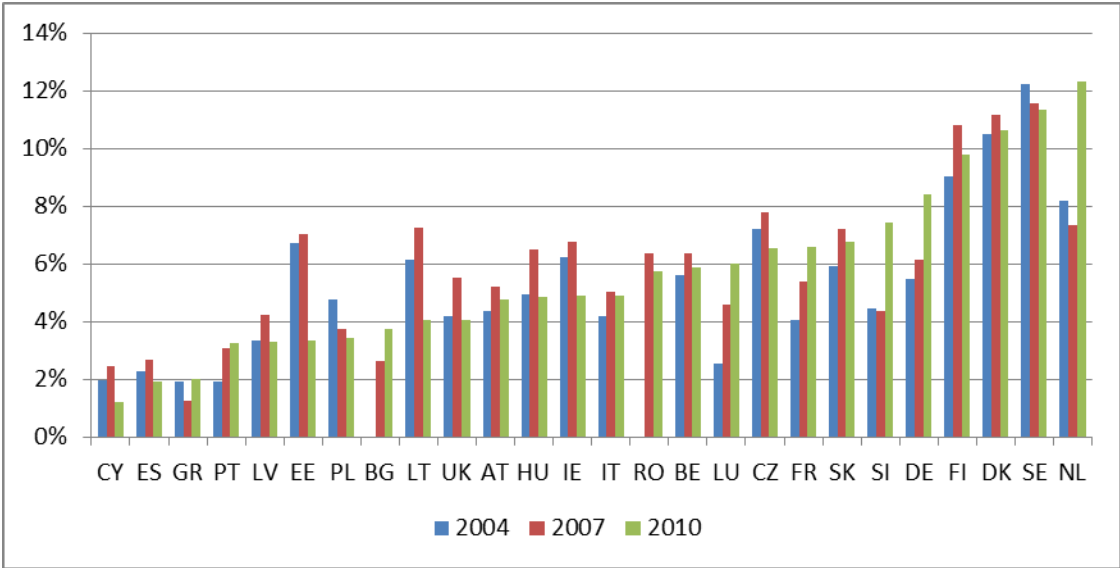
older working age (50-64) and above working age (65 and over). As it is shown in Figure 6, in general, differences in income between those in the different age groups contribute relatively little to overall inequality. In 2010 age is most important in Sweden, Denmark and France (but even there it accounted for only 4-6% of overall inequality). It is of negligible importance in Poland, Latvia and Ireland, implying that income differences are hardly related at all to differences in the age of the household head. As shown by differences between the various years, there basic pattern of the contribution of age remained unchanged between 2004 and 2010, though there has been some change in case of specific countries such as Denmark or the Netherlands.

**FIGURE 6: PROPORTIONAL CONTRIBUTION OF THE AGE OF HOUSEHOLD HEAD TO OVERALL INEQUALITY**



Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

**FIGURE 7: PROPORTIONAL CONTRIBUTION OF DIFFERENCES IN HOUSEHOLD STRUCTURE TO OVERALL INEQUALITY**



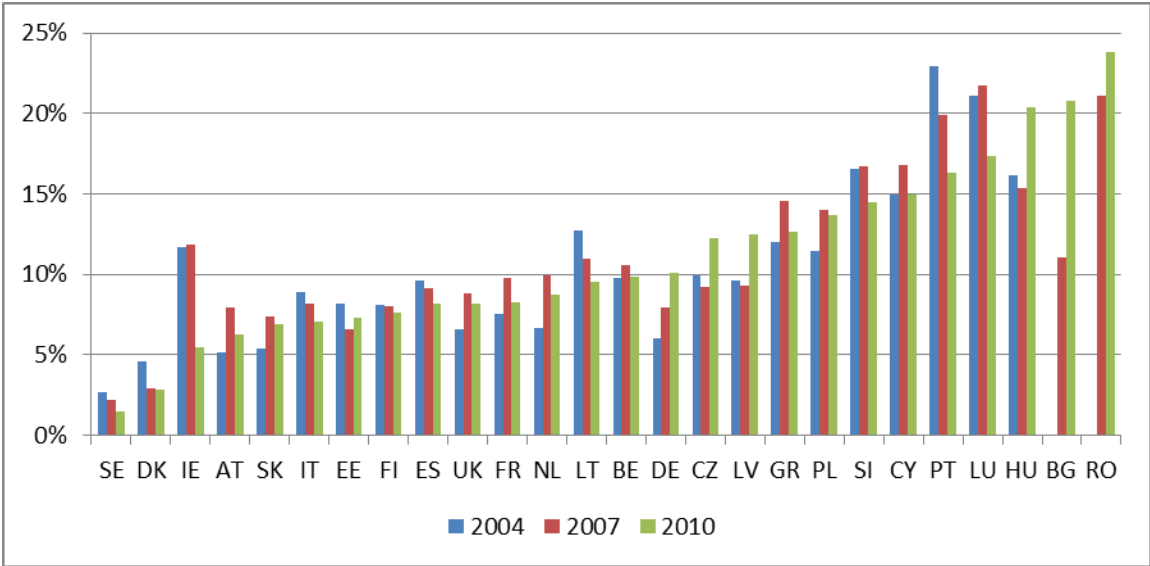
Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

Households are divided into six broad types to assess the effect of household composition on income inequality: one-person households, single-parent households, two- or more-person households without children, two-person households with one or two children, two-person households with three or more children, and other households with children. In 2010 in proportionate terms, household structure accounts for 12% of overall inequality in the Netherlands and around 10% in Sweden and in Denmark (see Figure 7). The effect is smallest in Cyprus, Greece, Spain and Portugal, where differences in household composition account for 3% or less of overall inequality. Between 2004 and 2010 the proportionate contribution of household structure increased in the Netherlands, Slovenia, Luxembourg and Germany, while decline has been detected in Ireland, Lithuania and Estonia.

In order to assess the effect on income distribution of variations in educational attainment, households were divided into three groups, according to the level of education of the household head: only basic (primary or lower secondary) schooling, upper secondary education, or tertiary qualifications. Figure 7 shows the effect of education on income inequality in the years studied.

There is considerable variation between Member States in the contribution of the household head's education level to overall inequality as shown in Figure 8. In 2010 differences in income between those with different education levels account for 24% of overall total inequality in Romania, 20-21% in Bulgaria and Hungary, 15% in Luxembourg and Portugal, but for only 3% in Denmark and Sweden. The importance of education tends to be relatively high in EU12 countries and relatively low in EU15 Member States (with the exception of the countries mentioned above). Between 2004 and 2010, the effect of differences in household income based on the education levels of household heads increased in countries like Bulgaria, Hungary, Romania and Latvia. By contrast, the effect diminished by around 5 percentage points in Ireland, Luxembourg, and Portugal.

**FIGURE 8: PROPORTIONAL CONTRIBUTION OF EDUCATION LEVEL OF HOUSEHOLD HEAD TO OVERALL INEQUALITY OF INCOME**



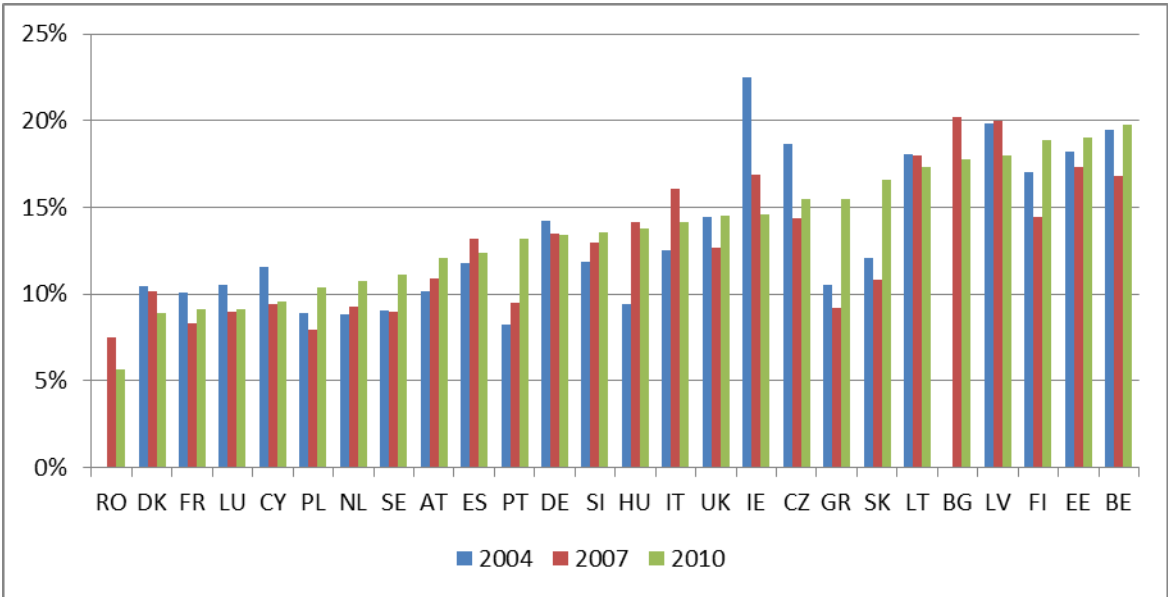
Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

The work intensity of a household is measured here as the ratio of the number of months spent in employment during the year by household members of working age (i.e. those aged 16-64) -

adjusted for part-time working (i.e. weighted by the number of hours worked per week relative to 35) - to the number of months they would work if they were all employed full time (defined as working 35 hours a week or more) throughout the year. Households where everyone of working age is employed full time throughout the year have a work intensity of 1. Those where no one of working age is employed have a work intensity of 0, while those with only one partner of a couple in full-time employment have a work intensity of 0.5. Households are divided into three groups with respect to work intensity: less than or equal to 0.5; 0.5-0.99; and 1.

Income differences between those living in households with different levels of work intensity account for a relatively large proportion of overall income inequality in Belgium, Estonia and Finland (19-20%, see Figure 9). By contrast, these differences account for just 6% of overall inequality in Romania and less than 10% in Luxembourg, Denmark, Cyprus and France. Between 2004 and 2010, the contribution of differences in work intensity to overall income inequality increased monotonically in a number of countries. Austria, Sweden, Netherlands, Portugal, Hungary and Slovenia recorded increasing proportional contribution of work intensity, which was generally more pronounced during the 2007-2010 period. In some cases a U-shaped pattern can be observed: the importance of work intensity declining between 2004 and 2007 and then becoming stronger by the end of the decade, as in the case of Belgium, Finland or the UK. In Romania, Denmark, the Czech Republic and –most importantly– in Ireland, the proportional contribution of work intensity has declined during this period.

**FIGURE 9: PROPORTIONAL CONTRIBUTION OF DIFFERENCES IN HOUSEHOLD WORK INTENSITY TO OVERALL INEQUALITY OF INCOME**

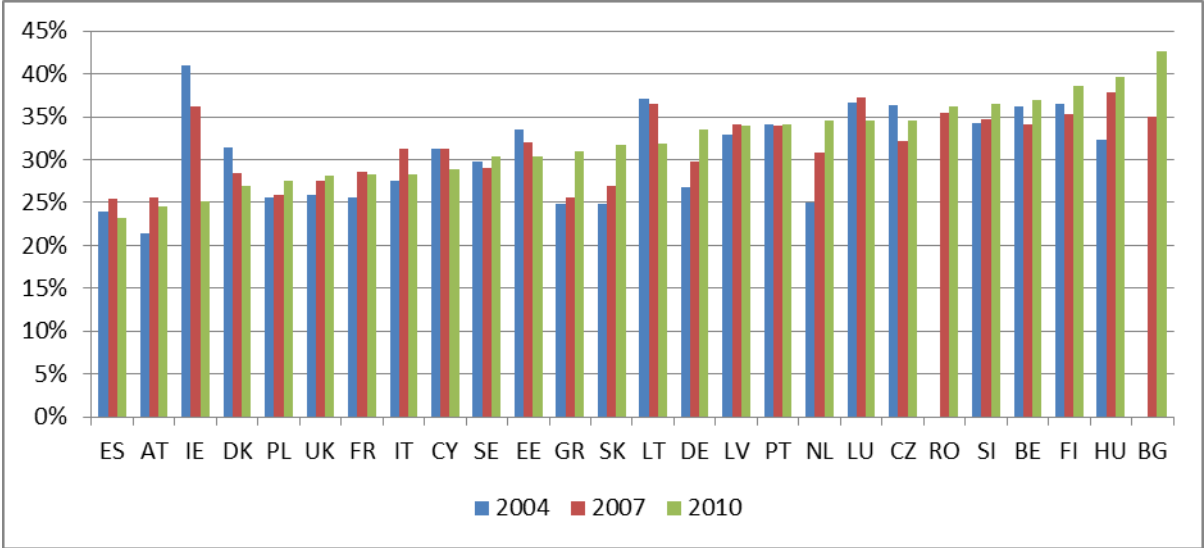


Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

In 2010, the four factors examined together accounted for around 40% in Hungary and Bulgaria (though the relative importance of the different factors varied significantly) (Figure 9). At the other extreme, they accounted for less than 25% of income inequality in Spain, Austria and Ireland; in Sweden, Austria, Poland, France and the UK, their combined contribution to income inequality was also less than 30%. In all EU countries, therefore, other factors had a larger effect than those identified. In other words, differences in income between households with similar characteristics (or

at least with the characteristics identified here) were more important than differences between those with different characteristics observed in the study.

**FIGURE 10: COMBINED EFFECT OF DIFFERENCES IN AGE, HOUSEHOLD STRUCTURE, EDUCATION LEVEL AND HOUSEHOLD WORK INTENSITY ON OVERALL INEQUALITY OF INCOME**



Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

**4.2.2 DECOMPOSITION OF THE CHANGE IN INEQUALITY BY POPULATION SUBGROUPS**

Following the methodology outlined in Section 2 we investigated the contribution of population characteristics to the change in inequality. Results are shown in the Appendix Tables A9 and A10. For example, in Germany inequality of disposable income as measured by the Gini index increased by 4 points between 2004 and 2007. From the analysis we see, that half of this increase is a result of increased within-group inequality measured by the residual of the regression. One fifth of the increase in inequality can be attributed to the education of household head, while the remaining components (age, household structure and work intensity) contribute each approximately 10% to the increase in inequality. The 3-point decline in the Gini index in Estonia is again to a large extent the result of decreased within-group dispersion, but work intensity and education also contribute 25-28% to the decline in inequality. Between 2007 and 2010, the largest increases in inequality were found in Ireland, Spain and Slovakia. In the case of Spain practically all of the rise in the Gini index is accounted for by the increasing residual, while in case of Ireland the residual increases so much that it counterbalances the inequality-reducing effect of other variables. In Slovakia almost the entire increase in inequality is the result of the inequality increasing effect of work intensity.

## 5 SUMMARY OF FINDINGS

In this analysis we studied components of income inequality and its change during the 2004-2010 period in EU Member States. The period under study has been divided into two sub periods following the business cycle: a period economic growth between 2004 and 2007 was followed by a period economic crisis and slowdown between 2007 and 2010. After describing the trends in income inequality we decomposed income inequality into contributions of different income sources and in the second part of the analysis we studied the contribution of different population characteristics to income inequality.

Between 2004 and 2007 inequality of market income declined in most countries for which data is available, most importantly in countries with important gains in employment, like Poland, Estonia and Lithuania. Between 2007 and 2010 market income inequality was rising in the majority of the countries. The biggest increase in market income inequality was recorded in Ireland and Spain, where the decline in employment was the most important. The change in inequality of disposable income was more moderate in most countries. In the 2004-2007 period inequality of disposable income increased in Germany, while it declined in Poland and Estonia. Between 2007 and 2010 inequality of disposable income increased the most in Ireland and Spain, but the Gini index declined in approximately half of the countries, despite market income inequality increased in the majority of the countries.

Contribution of income sources to inequality has been studied using the decomposition suggested by Shorrocks. In most countries both market income and government taxes and transfers play a role in shaping inequality of disposable income. Government taxes and transfers frequently succeed in moderating the inequality-increasing effects of market income. For example during the period 2004-2007 direct taxes moderated the inequality increasing effect of market income in case of Finland and Belgium, while in Austria the inequality reducing effect of pensions and direct taxes cancelled out the effect of market income. In the case of Germany no such counterbalancing effects were manifest and total income inequality increased as a result of the inequality increasing effects of market incomes. Market income had an inequality increasing effect during the 2007-2010 period in Denmark, Cyprus, France and the UK, but only in France do we see an increase in the Gini index of total income, in the other countries government redistribution neutralised this effect.

A number of household characteristics (age of the head of household, their education level, the household's structure and work intensity) affect the extent of inequality in income distribution. Differences in the age of the household head tend to have less effect than the other factors. The effect is largest in France and Sweden. Meanwhile, in Latvia, Poland and Ireland the effect is less than in other countries. The effect of differences in household structure is largest in the Nordic countries (especially in Sweden) and the Netherlands. The effect is smallest in Cyprus, and it is also below average in the other Southern countries (apart from Italy).

The level of education of the household head is particularly important in Romania, where it accounts for around one fourth of overall inequality; it also plays a greater-than-average role in Bulgaria and Hungary. By contrast, it accounts for a relatively small amount of the difference in income in Sweden and Denmark. The work intensity of the household has the largest effect in Belgium, Finland and the Baltic states; it has a relatively small effect in Romania, Denmark and France.

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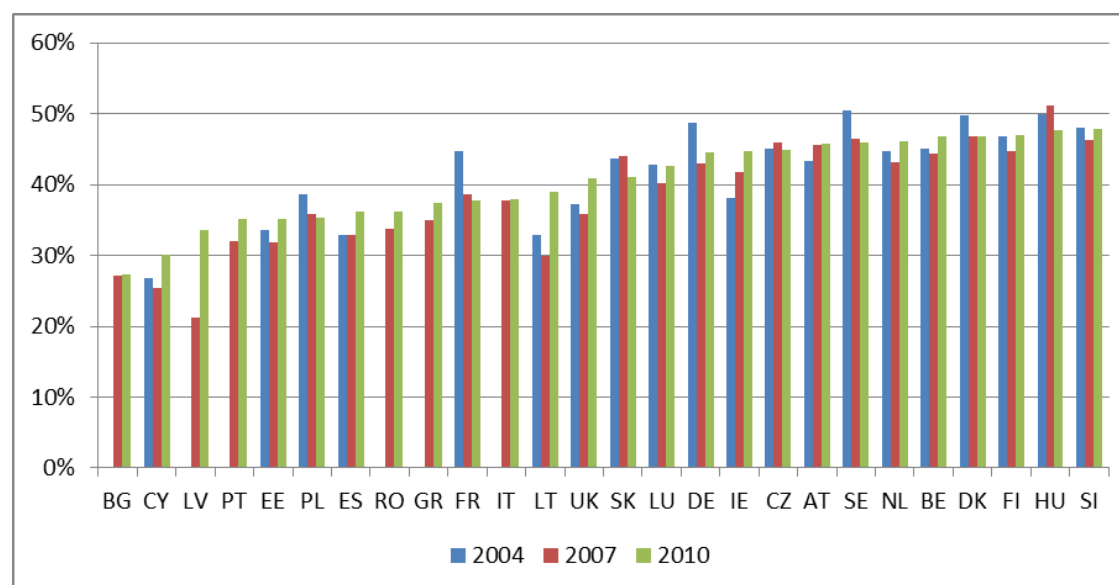
## APPENDIX

**TABLE A1: DECILE RATIO OF GROSS MONTHLY EARNINGS. MEN (P9/P1)**

	2004	2007	2010	Ratio 2004/2007	Ratio 2007/2010
AT	3.00	3.11	3.20	1.04	1.03
BE	2.44	2.31	2.39	0.95	1.03
CZ	2.90	3.01	3.11	1.04	1.03
DK	2.63	2.78	2.82	1.06	1.02
FI	2.52	2.61	2.64	1.04	1.01
FR	3.19	3.06	3.04	0.96	0.99
DE	2.97	3.24	3.25	1.09	1.00
GR	3.18	3.13	3.21	0.98	1.03
HU	5.27	4.71	4.78	0.89	1.02
IS	3.18	3.42	..	1.07	..
IE	3.76	3.83	3.66	1.02	0.95
IT	2.50	2.17	2.33	0.87	1.08
NL	2.86	..	..	..	..
NO	2.28	2.44	2.52	1.07	1.03
PL	4.00	3.96	3.46	0.99	0.87
PT	4.17	4.00	3.70	0.96	0.93
SK	3.56	3.62	3.95	1.02	1.09
ES	3.41	3.32	3.14	0.98	0.94
SE	2.37	2.45	2.37	1.03	0.97
UK	3.60	3.69	3.71	1.02	1.01

Source: OECD Employment Database

**FIGURE A1: PERCENTAGE REDUCTION IN THE GINI INDEX WHEN MOVING FROM INEQUALITY OF GROSS MARKET INCOME TO INEQUALITY OF DISPOSABLE INCOME**



Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

**TABLE A2 GINI INDEX OF GROSS MARKET INCOME INEQUALITY**

	Gini of market income (only positive)			% of individuals with positive market income			Gini of market income (with zeros)		
	2004	2007	2010	2004	2007	2010	2004	2007	2010
AT	0.436	0.451	0.453	0.96	0.95	0.94	0.460	0.481	0.484
BE	0.450	0.445	0.441	0.90	0.92	0.91	0.507	0.488	0.490
BG		0.436	0.415		0.90	0.89		0.493	0.482
CY	0.332	0.321	0.360	0.91	0.92	0.92	0.392	0.375	0.412
CZ	0.372	0.361	0.365	0.84	0.85	0.85	0.474	0.457	0.457
DE	0.449	0.490	0.480	0.90	0.94	0.93	0.503	0.521	0.516
DK	0.408	0.421	0.433	0.92	0.93	0.90	0.453	0.459	0.488
EE	0.406	0.390	0.420	0.84	0.90	0.88	0.503	0.452	0.490
ES	0.393	0.390	0.404	0.88	0.90	0.82	0.467	0.452	0.512
FI	0.449	0.451	0.460	0.94	0.96	0.95	0.483	0.475	0.486
FR	0.356	0.454	0.482	0.78	0.97	0.98	0.500	0.472	0.494
GR		0.431	0.429		0.87	0.83		0.502	0.525
HU	0.459	0.419	0.414	0.84	0.84	0.83	0.547	0.515	0.512
IE	0.422	0.434	0.469	0.84	0.86	0.76	0.515	0.514	0.594
IT		0.441	0.440		0.91	0.88		0.491	0.507
LT	0.446	0.405	0.422	0.84	0.87	0.81	0.535	0.480	0.531
LU	0.392	0.430	0.439	0.89	0.95	0.95	0.457	0.460	0.469
LV		0.424	0.445		0.91	0.86		0.477	0.526
NL	0.437	0.451	0.445	0.95	0.96	0.97	0.464	0.473	0.463
PL	0.467	0.413	0.399	0.80	0.86	0.87	0.576	0.497	0.479
PT		0.448	0.431		0.86	0.83		0.526	0.527
RO		0.448	0.425		0.83	0.84		0.540	0.518
SE	0.426	0.415	0.416	0.94	0.96	0.95	0.459	0.438	0.445
SI	0.397	0.387	0.397	0.90	0.92	0.90	0.457	0.436	0.456
SK	0.348	0.324	0.355	0.83	0.86	0.87	0.460	0.421	0.436
UK	0.466	0.457	0.464	0.86	0.88	0.84	0.543	0.524	0.551

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

**TABLE A3: GINI INDICES OF INEQUALITY IN HOUSEHOLD DISPOSABLE INCOME**

	2004	2007	2010
AT	0.261	0.262	0.263
BE	0.279	0.271	0.261
BG		0.359	0.351
CY	0.287	0.280	0.288
CZ	0.260	0.247	0.252
DE	0.258	0.297	0.286
DK	0.227	0.244	0.260
EE	0.336	0.308	0.317
ES	0.315	0.303	0.326
FI	0.257	0.263	0.258
FR	0.276	0.289	0.308
GR	0.326	0.326	0.329
HU	0.274	0.251	0.268
IE	0.318	0.299	0.329
IT	0.323	0.306	0.314
LT	0.359	0.336	0.324
LU	0.262	0.276	0.269
LV	0.355	0.375	0.349
NL	0.257	0.269	0.249
PL	0.354	0.319	0.310
PT	0.381	0.358	0.342
RO		0.359	0.331
SE	0.227	0.234	0.240
SI	0.238	0.234	0.238
SK	0.259	0.236	0.257
UK	0.341	0.337	0.326

**TABLE A4A: PROPORTIONAL CONTRIBUTION OF INCOME SOURCES TO INEQUALITY OF HOUSEHOLD DISPOSABLE INCOME (SHORROCKS DECOMPOSITION)**

	Labour income			Capital income			Market income total		
	2004	2007	2010	2004	2007	2010	2004	2007	2010
AT	1.12	1.46	1.29	0.07	0.07	0.10	1.19	1.53	1.38
BE	1.03	1.37	1.11	0.01	0.08	0.06	1.04	1.44	1.17
BG		1.17	1.12		0.02	0.03		1.19	1.16
CY	0.94	0.73	0.85	0.08	0.05	0.07	1.02	0.78	0.92
CZ	1.52	1.50	1.35	0.03	0.06	0.04	1.54	1.56	1.39
DE	1.25	1.30	1.31	0.05	0.06	0.05	1.30	1.36	1.35
DK	1.84	1.21	1.64	0.07	0.14	0.07	1.90	1.35	1.71
EE	1.38	1.33	1.30	0.01	0.04	0.01	1.39	1.37	1.30
ES	1.17	1.18	1.10	0.03	0.05	0.04	1.20	1.23	1.14
FI	1.06	1.41	1.40	0.18	0.24	0.24	1.24	1.65	1.63
FR	1.07	0.77	0.86	0.00	0.30	0.27	1.07	1.07	1.13
GR		1.36	1.21		0.10	0.09		1.46	1.30
HU	1.60	1.42	1.32	0.02	0.04	0.02	1.62	1.46	1.33
IE	1.27	1.22	1.20	0.05	0.10	0.02	1.32	1.32	1.22
IT		1.25	1.19	0.00	0.07	0.07		1.32	1.25
LT	1.32	1.18	1.13	0.02	0.08	0.08	1.34	1.26	1.21
LU	1.20	1.21	1.21	0.13	0.09	0.08	1.33	1.29	1.30
LV		1.24	1.24		0.04	0.00		1.28	1.24
NL	1.33	1.37	1.69	0.02	0.26	0.08	1.35	1.63	1.77
PL	1.22	1.31	1.20	0.02	0.02	0.13	1.24	1.33	1.33
PT		1.22	1.18		0.03	0.06		1.25	1.23
RO		1.25	1.11		0.02	0.02		1.27	1.13
SE	1.69	1.51	1.54	0.04	0.07	0.08	1.73	1.59	1.62
SI	1.58	1.57	1.48	0.03	0.04	0.10	1.61	1.61	1.57
SK	1.33	1.36	0.67	0.00	0.01	0.00	1.33	1.36	0.67
UK	1.34	1.46	1.63	0.08	0.06	0.04	1.43	1.52	1.67

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

**TABLE A4B: PROPORTIONAL CONTRIBUTION OF INCOME SOURCES TO INEQUALITY OF HOUSEHOLD DISPOSABLE INCOME (SHORROCKS DECOMPOSITION)**

	Pensions			Social transfers			Direct taxes		
	2004	2007	2010	2004	2007	2010	2004	2007	2010
AT	0.36	0.11	0.16	-0.02	-0.02	-0.04	-0.53	-0.62	-0.51
BE	0.00	-0.01	0.02	0.00	-0.03	-0.04	-0.04	-0.40	-0.14
BG		-0.03	0.01		-0.01	0.01		-0.15	-0.17
CY	0.07	0.28	0.25	0.05	0.05	0.02	-0.15	-0.11	-0.18
CZ	-0.04	-0.07	-0.05	-0.05	-0.04	-0.02	-0.45	-0.45	-0.33
DE	0.09	0.05	0.11	-0.02	-0.01	-0.01	-0.37	-0.41	-0.45
DK	-0.06	-0.04	-0.03	-0.08	-0.06	-0.04	-0.76	-0.25	-0.63
EE	-0.04	-0.07	-0.04	0.01	0.00	0.04	-0.37	-0.30	-0.30
ES	0.02	0.02	0.08	0.03	0.01	0.01	-0.25	-0.27	-0.23
FI	0.02	-0.02	0.01	-0.06	-0.06	-0.08	-0.19	-0.56	-0.56
FR	0.26	0.17	0.17	0.01	0.00	-0.02	-0.34	-0.24	-0.29
GR	0.00	0.13	0.17	0.00	-0.01	-0.01	0.00	-0.58	-0.46
HU	0.07	0.14	0.11	-0.02	-0.04	-0.06	-0.67	-0.56	-0.39
IE	0.01	0.05	0.14	-0.03	-0.05	-0.02	-0.31	-0.33	-0.34
IT	0.00	0.19	0.20	0.00	0.04	0.03	0.00	-0.54	-0.49
LT	-0.01	-0.01	-0.01	0.00	0.01	0.06	-0.32	-0.26	-0.27
LU	0.11	0.05	0.14	-0.02	0.03	-0.04	-0.42	-0.38	-0.40
LV	0.00	-0.02	0.03	0.00	0.03	0.07	0.00	-0.29	-0.35
NL	0.16	0.07	0.18	-0.06	-0.04	-0.07	-0.46	-0.66	-0.88
PL	0.10	0.04	0.06	-0.01	-0.01	-0.02	-0.32	-0.36	-0.37
PT	0.00	0.17	0.23	0.00	0.02	0.00	0.00	-0.45	-0.46
RO		0.06	0.19		-0.01	0.00		-0.31	-0.32
SE	0.03	-0.01	0.00	-0.07	-0.05	-0.07	-0.70	-0.52	-0.55
SI	0.08	0.07	0.08	-0.04	-0.03	-0.04	-0.65	-0.65	-0.62
SK	0.05	-0.02	0.43	-0.03	-0.03	0.01	-0.36	-0.32	-0.10
UK	0.12	0.03	0.05	-0.04	-0.02	-0.04	-0.51	-0.52	-0.69

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

**TABLE A5: ABSOLUTE CONTRIBUTION TO CHANGE IN INEQUALITY OF DISPOSABLE INCOME AS MEASURED BY THE GINI INDEX (GINI POINTS). 2004-2007**

	Market income	Pensions	Social transfers	Direct taxes	Point change in Gini
AT	9.1	-6.3	-0.2	-2.4	0.1
BE	10.1	-0.3	-0.7	-9.8	-0.7
BG					
CY	-7.5	5.8	-0.2	1.1	-0.8
CZ	-1.6	-0.6	0.2	0.7	-1.2
DE	6.8	-0.7	0.5	-2.7	3.9
DK	-10.2	0.3	0.4	11.1	1.7
EE	-4.5	-0.9	-0.3	3.0	-2.8
ES	-0.4	0.0	-0.6	-0.2	-1.2
FI	11.5	-1.0	-0.1	-9.8	0.6
FR	1.5	-2.4	-0.1	2.3	1.3
GR					
HU	-7.7	1.7	-0.5	4.2	-2.3
IE	-2.6	1.1	-0.5	0.1	-1.9
IT					
LT	-5.6	0.0	0.5	2.8	-2.3
LU	0.8	-1.2	1.2	0.6	1.4
LV					
NL	9.1	-2.2	0.4	-6.1	1.2
PL	-1.4	-2.1	0.1	-0.1	-3.5
PT					
RO					
SE	-2.2	-0.9	0.2	3.5	0.7
SI	-0.6	-0.2	0.2	0.2	-0.4
SK	-2.3	-1.7	0.0	1.8	-2.3
UK	2.5	-3.2	0.6	-0.3	-0.4

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.

**TABLE A6: ABSOLUTE CONTRIBUTION TO CHANGE IN INEQUALITY OF DISPOSABLE INCOME AS MEASURED BY THE GINI INDEX (GINI POINTS). 2007-2010**

	Market income	Pensions	Social transfers	Direct taxes	Point change in Gini
AT	-3.8	1.3	-0.3	2.8	0.1
BE	-8.7	0.9	-0.4	7.1	-1.1
BG	-2.1	1.4	0.5	-0.6	-0.8
CY	4.6	-0.8	-0.9	-2.1	0.8
CZ	-3.4	0.6	0.6	2.8	0.5
DE	-1.8	1.6	0.0	-0.9	-1.1
DK	11.4	0.2	0.3	-10.3	1.6
EE	-0.9	0.8	1.2	-0.1	0.9
ES	-0.1	1.9	-0.1	0.6	2.3
FI	-1.4	0.8	-0.4	0.4	-0.5
FR	3.8	0.6	-0.8	-1.8	1.8
GR	-4.7	1.1	-0.1	4.0	0.3
HU	-1.1	-0.5	-0.6	3.9	1.7
IE	0.0	3.0	1.0	-1.0	3.0
IT	-0.9	0.6	-0.1	1.3	0.9
LT	-3.2	0.1	1.7	0.2	-1.2
LU	-0.8	2.4	-1.9	-0.3	-0.6
LV	-4.4	2.1	1.1	-1.4	-2.6
NL	0.2	2.6	-0.8	-4.1	-2.0
PL	-1.1	0.5	-0.4	0.1	-0.9
PT	-2.7	1.7	-0.9	0.3	-1.5
RO	-8.0	4.3	0.2	0.8	-2.8
SE	1.8	0.2	-0.4	-1.0	0.6
SI	-0.2	0.3	-0.2	0.5	0.4
SK	-15.0	11.4	0.9	4.8	2.1
UK	3.5	0.7	-0.5	-4.7	-1.1

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Spain the earliest data comes from EU-SILC 2006 UDB, for Ireland latest data come from EU-SILC 2010 UDB. In the case of Greece, Italy, France, Portugal and Latvia data on gross market incomes were not available for year 2004.



**TABLE A7: PROPORTIONAL CONTRIBUTION OF POPULATION CHARACTERISTICS TO LEVEL OF INEQUALITY**

	Age of household head			Household structure		
	2004	2007	2010	2004	2007	2010
AT	0.02	0.02	0.01	0.04	0.05	0.05
BE	0.01	0.00	0.01	0.06	0.06	0.06
BG		0.01	0.00		0.03	0.04
CY	0.03	0.03	0.03	0.02	0.02	0.01
CZ	0.00	0.01	0.00	0.07	0.08	0.07
DE	0.01	0.02	0.02	0.05	0.06	0.08
DK	0.06	0.04	0.04	0.10	0.11	0.11
EE	0.00	0.01	0.01	0.07	0.07	0.03
ES	0.00	0.00	0.01	0.02	0.03	0.02
FI	0.02	0.02	0.02	0.09	0.11	0.10
FR	0.04	0.05	0.04	0.04	0.05	0.07
GR	0.00	0.00	0.01	0.02	0.01	0.02
HU	0.02	0.02	0.01	0.05	0.07	0.05
IE	0.01	0.01	0.00	0.06	0.07	0.05
IT	0.02	0.02	0.02	0.04	0.05	0.05
LT	0.00	0.00	0.01	0.06	0.07	0.04
LU	0.03	0.02	0.02	0.03	0.05	0.06
LV	0.00	0.01	0.00	0.03	0.04	0.03
NL	0.01	0.04	0.03	0.08	0.07	0.12
PL	0.00	0.00	0.00	0.05	0.04	0.03
PT	0.01	0.01	0.01	0.02	0.03	0.03
RO		0.00	0.01		0.06	0.06
SE	0.06	0.06	0.06	0.12	0.12	0.11
SI	0.01	0.01	0.01	0.04	0.04	0.07
SK	0.01	0.01	0.01	0.06	0.07	0.07
UK	0.01	0.01	0.01	0.04	0.06	0.04

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

**TABLE A8: PROPORTIONAL CONTRIBUTION OF POPULATION CHARACTERISTICS TO LEVEL OF INEQUALITY**

	Education level of household head			Work intensity		
	2004	2007	2010	2004	2007	2010
AT	0.05	0.08	0.06	0.10	0.11	0.12
BE	0.10	0.11	0.10	0.19	0.17	0.20
BG		0.11	0.21		0.20	0.18
CY	0.15	0.17	0.15	0.12	0.09	0.10
CZ	0.10	0.09	0.12	0.19	0.14	0.16
DE	0.06	0.08	0.10	0.14	0.13	0.13
DK	0.05	0.03	0.03	0.10	0.10	0.09
EE	0.08	0.07	0.07	0.18	0.17	0.19
ES	0.10	0.09	0.08	0.12	0.13	0.12
FI	0.08	0.08	0.08	0.17	0.14	0.19
FR	0.08	0.10	0.08	0.10	0.08	0.09
GR	0.12	0.15	0.13	0.11	0.09	0.16
HU	0.16	0.15	0.20	0.09	0.14	0.14
IE	0.12	0.12	0.06	0.23	0.17	0.15
IT	0.09	0.08	0.07	0.13	0.16	0.14
LT	0.13	0.11	0.10	0.18	0.18	0.17
LU	0.21	0.22	0.17	0.11	0.09	0.09
LV	0.10	0.09	0.12	0.20	0.20	0.18
NL	0.07	0.10	0.09	0.09	0.09	0.11
PL	0.11	0.14	0.14	0.09	0.08	0.10
PT	0.23	0.20	0.16	0.08	0.10	0.13
RO		0.21	0.24		0.08	0.06
SE	0.03	0.02	0.02	0.09	0.09	0.11
SI	0.17	0.17	0.15	0.12	0.13	0.14
SK	0.05	0.07	0.07	0.12	0.11	0.17
UK	0.07	0.09	0.08	0.14	0.13	0.15

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

**TABLE A9: ABSOLUTE CONTRIBUTION TO CHANGE IN INEQUALITY AS MEASURED BY THE GINI INDEX. 2004-2007 (GINI POINTS)**

	Age of hhd head	Household structure	Education of HHd head	Work intensity	Residual	Gini change
AT	0.0	0.2	0.7	0.2	-1.0	0.1
BE	-0.3	0.2	0.1	-0.9	0.1	-0.7
BG						
CY	-0.1	0.1	0.4	-0.7	-0.5	-0.8
CZ	0.1	0.1	-0.3	-1.3	0.2	-1.2
DE	0.4	0.4	0.8	0.3	2.0	3.9
DK	-0.3	0.3	-0.3	0.1	1.9	1.7
EE	0.2	-0.1	-0.7	-0.8	-1.4	-2.8
ES	0.0	0.1	-0.3	0.3	-1.3	-1.2
FI	0.0	0.5	0.0	-0.6	0.7	0.6
FR	0.4	0.4	0.8	-0.4	0.1	1.3
GR	0.0	-0.2	0.9	-0.4	-0.3	0.0
HU	0.0	0.3	-0.6	1.0	-2.9	-2.3
IE	0.0	0.0	-0.2	-2.1	0.3	-1.9
IT	0.0	0.2	-0.4	0.9	-2.4	-1.8
LT	0.0	0.2	-0.9	-0.4	-1.2	-2.3
LU	-0.2	0.6	0.5	-0.3	0.8	1.4
LV	0.2	0.4	0.1	0.4	0.9	2.0
NL	0.9	-0.1	0.9	0.2	-0.7	1.2
PL	-0.1	-0.5	0.4	-0.6	-2.7	-3.5
PT	0.2	0.4	-1.6	0.3	-1.5	-2.3
RO						
SE	0.1	-0.1	-0.1	0.1	0.7	0.7
SI	-0.1	0.0	0.0	0.2	-0.4	-0.4
SK	0.0	0.2	0.3	-0.6	-2.2	-2.3
UK	0.0	0.4	0.7	-0.7	-0.9	-0.4

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

**TABLE A10: ABSOLUTE CONTRIBUTION TO CHANGE IN INEQUALITY AS MEASURED BY THE GINI INDEX. 2007-2010 (GINI POINTS)**

	Age of hhd head	Household structure	Education of HHd head	Work intensity	Residual	Gini change
AT	0.0	-0.1	-0.4	0.3	0.3	0.1
BE	0.3	-0.2	-0.3	0.6	-1.4	-1.1
BG	-0.2	0.4	3.3	-1.0	-3.3	-0.8
CY	0.1	-0.3	-0.4	0.1	1.3	0.8
CZ	-0.1	-0.3	0.8	0.4	-0.3	0.5
DE	-0.2	0.6	0.5	-0.2	-1.9	-1.1
DK	0.1	0.0	0.0	-0.2	1.5	1.6
EE	-0.1	-1.1	0.3	0.7	1.2	0.9
ES	0.1	-0.2	-0.1	0.0	2.4	2.3
FI	0.0	-0.3	-0.1	1.1	-1.2	-0.5
FR	-0.1	0.5	-0.3	0.4	1.4	1.8
GR	0.1	0.3	-0.6	2.1	-1.6	0.3
HU	-0.3	-0.3	1.6	0.1	0.6	1.7
IE	-0.1	-0.4	-1.7	-0.2	5.5	3.0
IT	0.1	0.0	-0.3	-0.5	1.5	0.9
LT	0.2	-1.1	-0.6	-0.4	0.7	-1.2
LU	0.0	0.4	-1.3	0.0	0.3	-0.6
LV	-0.2	-0.4	0.9	-1.2	-1.7	-2.6
NL	-0.5	1.1	-0.5	0.2	-2.3	-2.0
PL	0.0	-0.1	-0.2	0.7	-1.2	-0.9
PT	-0.1	0.0	-1.5	1.1	-1.1	-1.5
RO	0.2	-0.4	0.3	-0.8	-2.1	-2.8
SE	0.0	0.0	-0.2	0.6	0.2	0.6
SI	0.1	0.8	-0.5	0.2	-0.2	0.4
SK	0.0	0.0	0.0	1.7	0.3	2.1
UK	0.2	-0.5	-0.3	0.5	-0.9	-1.1

Source: own calculation based on EU-SILC 2005, 2008 and 2011 UDB. In case of Ireland the latest data come from EU-SILC 2010 UDB.

## **ImProvE: Poverty Reduction in Europe. Social Policy and Innovation**

Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE) is an international research project that brings together ten outstanding research institutes and a broad network of researchers in a concerted effort to study poverty, social policy and social innovation in Europe. The ImPRovE project aims to improve the basis for evidence-based policy making in Europe, both in the short and in the long term. In the short term, this is done by carrying out research that is directly relevant for policymakers. At the same time however, ImPRovE invests in improving the long-term capacity for evidence-based policy making by upgrading the available research infrastructure, by combining both applied and fundamental research, and by optimising the information flow of research results to relevant policy makers and the civil society at large.

The two central questions driving the ImPRovE project are:

How can social cohesion be achieved in Europe?

How can social innovation complement, reinforce and modify macro-level policies and vice versa?

The project runs from March 2012 till February 2016 and receives EU research support to the amount of Euro 2.7 million under the 7<sup>th</sup> Framework Programme. The output of ImPRovE will include over 55 research papers, about 16 policy briefs and at least 3 scientific books. The ImPRovE Consortium will organise two international conferences (Spring 2014 and Winter 2015). In addition, ImPRovE will develop a new database of local projects of social innovation in Europe, cross-national comparable reference budgets for 6 countries (Belgium, Finland, Greece, Hungary, Italy and Spain) and will strongly expand the available policy scenarios in the European microsimulation model EUROMOD.

More detailed information is available on the website <http://improve-research.eu>.

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